Detailed analysis of the liquid fuel and bottled gas sectors in Portugal

Final Report

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Note: This is an English version of the original Portuguese version. Only the latter is the official version of the March 2009 Final Report.

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Executive summary

1. Introduction

This is the final report on the liquid fuels and bottled gas markets in Portugal and provides a detailed analysis following on June 2008 Preliminary Report and the December 2008 Interim Report. The aim is to make a more thorough and detailed analysis over a longer period of time than the previous reports, with the information covering the whole of 2008.

The Report addresses a number of features of the markets in liquid fuels and bottled gas, including structural and regulatory issues. Given this, and the empirical approach that is used, it is hoped that it has thrown up a wealth of data and an analysis that can help move the debate from mere opinion to facts and figures to a disciplined reasoning.

Shaping the debate in this way is all the more important as liquid fuels are a source of non-renewable energy and the Portugal should take advantage of the current trend in the prices of crude oil to continue pursuing an energy saving and efficiency enhancing strategy, bringing renewable energy sources more into play. In this way, it can gird itself for successfully coming to terms with the expected future sustained increases in the price of crude.

This Report was put together with two important outer markers, one geographical and the other product-based. These markers were deemed necessary to allow for a rigorous detailed analysis, fully focused on the elements that are necessary and sufficient for an understanding of the details and the wider issues, within the timescale defined for this purpose. This timescale had to be kept rigidly, given the vast amount of information to be handled, the timing when the most recent data were available and the ambition underlying the analysis.

On the geographical side, the analysis takes in mainland Portugal only. It does not include the autonomous regions of the Azores and Madeira, which, being island archipelagos, have their own specific features.

On the product side, the analysis takes in four items representative of the sector: 95-octane gasoline and diesel for road use in the liquid fuels, and bottled butane and propane in the LPG (liquid petroleum gas) sector. Butane and propane have an

important social role, since they are the only gas based fuel accessible in several regions in the country where natural gas has not arrived, and in sensitive areas of urban districts.

As a final point, the Portuguese Competition Authority always bore in mind the fact that the sector has very specific features, and is subject to stringent regulations regarding for instance the environment and safety, as well as a specific tax regime. These facts, of course, could not be ignored in this analysis.

2. Fundamental ideas on the markets in crude and in liquid fuels

Operations involving oil can be divided into two main stages: upstream (exploration, development, production, transport and sales of crude); and downstream (refining, primary transport and storage, wholesale operations, secondary transport and storage and retail sales in service stations).

The whole raft of upstream and downstream operations lead to a value chain where quantification provides a clear indication of: (i) the relative weight of each stage in the chain, and (ii) the impact that economic agents can have on the chain, ranging from operators to consumers, as well as sector regulators, competition and the tax authorities.

As far as the markets are concerned, an analysis shows up three basic segments: (i) the international markets in crude; (ii) the international markets for gasoline and diesel; and (iii) domestic markets for gasoline and diesel. The last of these can be broken down into wholesale markets, which may have regional characteristics, and retail markets, which have a strong local flavour.

Each of these three aggregates can be broken down into more specific markets, but it is easier to think in aggregate terms in order to come to an understanding of the way they work, their interrelationships and the behaviour of each one.

Markets in crude oil are strongly influenced on the supply side by a cartel of oil producing sovereign states that account for around 39% of world supply and fix their members' production quotas. The demand side is made up of an array of companies involved in refining and major traders. The individual size of these traders is too small to influence the price of crude in any relevant way. Whenever

there is a reduction in supply, there is a price rise in the international markets for crude. This cannot be controlled or avoided by companies operating in Portugal, a country which accounts for less than 1% of world demand for crude.

The international markets in liquid fuels are those where large volumes of oil-based products are purchased and sold ex-refinery/ex-tanker. The products may come into international trade involving imports or exports. To see how prices are structured, specific international references are used for each product (*Platts*), not the international prices of crude in London (known as *Brent*). For Portugal, as for the whole of atlantic and northern Europe, including the northern part of Spain and France, the international reference price is *Platts* NWE, also known as *Platts* Rotterdam. This is the international context for the Portuguese liquid fuels and bottled gas sectors.

This Report therefore allows us to provide the groundwork for three key ideas for understanding how the liquid fuel sector works in Portugal. This is in fact much the same in most countries in the European Union and the OECD. These are:

(i) The markets in liquid fuels are strongly influenced by the markets in crude (Brent in the case of Europe), but they do not depend solely on these markets and above all they do not depend on them in a simple, linear fashion. For this reason, in the short term, the prices of refined products, among them liquid fuels, may vary in terms of range or direction from the price of crude, although in the long term, there will be a high correlation with the price of crude. In particular, there are short-term lags and asymmetries in adjusting the prices of liquid fuels to changes in the price of crude, both internationally (*Platts*), and in domestic terms. These lags and asymmetries are, of course, more visible in periods of steep and rapid variations in the prices of crude, as in 2008, than in periods of relatively stable prices.

(ii) Domestic ex-refinery price, in the absence of barriers to imports, will tend to be identical to the international reference price (in the case of Portugal - *Platts* NWE) plus relevant spreads (transport costs, freight, insurance, damage and others), since liquid fuels are tradable goods. If the ex-refinery price were higher, it would be better to import liquid fuels rather than refine crude. If it were lower, there would be no sense selling at that price, since potential purchasers would not have any alternative to fill up at the same or a lower price. In other words, internal and external demand would be in

excess of the quantity of domestic supply. Since it is not possible to discriminate between the two types of demand, at least within the European Union, it would not be possible to satisfy both types of demand without having recourse to some discriminatory procedure.

(iii) In domestic terms, the stages in the value chain which are of concern in terms of competition are at two points: one is storage and transport after refining and after import (logistics), and the other is in retail operations. Their relative proportion in the value chain in Portugal is around 10% of the retail price or 21% of the retail price before tax. In other words, if it were possible to reduce the costs of logistics and retail operations to absolute zero, the prices of retail sales for 95-octane gasoline and diesel for road use – which in 2008 were on average 1,388 and 1,260 euros per litre respectively – would be around 13 cents per litre lower.

Finally, it is worth mentioning that perhaps the most striking fact in competition terms over the last few years (affecting Spain as well Portugal) was the fact that three international oil companies – Shell, Esso and Agip – decided to close down their operations in the Iberian peninsula.

3. Main conclusions of the final Report

This information gathered together and substantiated in this detailed report has provided the Portuguese Competition Authority with the wherewithal to (i) structure its *competition advocacy* in specific terms for the liquid fuels and bottled gas sectors, and (ii) assess the legal and competition position of clauses in contracts signed between players in the sector, namely the vertical agreements between oil companies and fuel wholesalers to find if there have been any breaches of competition law[1].

At this point also, the Portuguese Competition Authority is presenting a set of recommendations on structural, regulatory and behavioural features which would bring improvements to the markets and therefore to consumers.

[1] Law no. 18/2003, from 11 of June, and Articles 81 and 82 of the EC Treaty. Similarly, the compatibility of vertical agreements with competition rules ought to be analysed according to the Block Exemption Regulations (BER) - see Commission Regulation (EC) No 2790/1999, from 22 December, on the application of Article 81(3) of the Treaty to categories of vertical agreements and concerted practices.

In short, the main conclusions of the report are:

(a) The way the liquid fuel market works in Portugal is similar to most other countries in the European Union or the OECD. This is as expected, given that liquid fuels are a tradable commodity and Portugal is a small open economy within the European Union.

(b) In Portugal, the prices of liquid fuels – domestic ex-refinery or imported – are based on the international reference prices (*Platts*), plus related spreads on transport costs, freight, insurance and damage. In a market of tradable commodities subject to the discipline of international reference prices such as liquid fuels, it makes no economic sense for a small open economy to have prices that are different from international prices.

(c) In Portugal, for the period between 2004 and 2008, average pre-tax prices (PMAI in the Portuguese acronym) tended to adjust completely to changes in international reference prices (*Platts*) with a 4- to 5-week lag for diesel and a 5- to 6-week lag for 95-octane gasoline.

(d) Over the same period, the average pre-tax prices in the UE15 tended also to adjust completely to changes in international reference prices (Platts) with a 2- to 3-week lag for diesel and a 3-week lag for 95-octane gasoline.

(e) In Portugal, over the same period, average pre-tax prices tended to adjust completely to changes in international reference prices (*Platts*) with a 1-week asymmetry, that is the adjustment of average pre-tax prices to a rise in the reference price tended to occur one week earlier than an adjustment to a fall, a phenomenon seen in a number of other European countries. It is not possible to conclude from this that there has been a breach of competition law.

(f) In Portugal, retail prices of liquid fuels, as in other European countries, depend fundamentally on three components: in the first place, on taxes (between 46% for diesel for road use and 59% for gasoline in 2008); in the second place, on domestic or international ex-refinery prices (between 32% for gasoline and 44% for diesel for road use in 2008); and in the third place, but to a far lesser degree, on logistics (storage and transport) and retail operations (around 10% for both fuels in 2008). To this should be added the fact that the first and most important component in the retail price is tax. This is exogenous to market players, that is, it is a variable over which these players have neither control nor influence and the second biggest component (ex-refinery prices) is predominantly an international factor.

(g) In the same way, the nominal differentiation between retail prices in Portugal is normally no more than 2 cents – with the exception of supermarket forecourts, where the difference tends to be bigger – and is very much conditioned by a number of structural factors. Of course, a nominal difference of 1 to 2 cents is small in absolute terms, and above all in the eyes of the consumer, but in the context of a business where retail margins are small, varying between 3 and 6 cents, it may represent a significant percentage of this margin.

(h) In Portugal, there is a visible parallel behaviour involving both the major oil companies and independent operators. This parallel behaviour, however, does not by itself indicate concerted horizontal price fixing, since with homogeneous products and a transparent market all the operators tend to know the relevant prices in real time. As already clarified by Community jurisprudence, these market features make it very difficult to sustain in the courts that such parallel behaviour does not merely show an intelligent adaptation to market conditions and that is must be the result of concerted practices.

(i) In Portugal, domestic retail prices before tax have never been far from the EU27 average, nor are they ever extreme either above or below this average.

(j) Nevertheless, there are structural, regulatory and behavioural features which are important to ensure stronger market contestability. They are among the recommendations that the Portuguese Competition Authority presents in this Report.

The conclusions of this Report are also applicable to bottled gas wherever relevant.

4. Major topics in the final Report

This report starts with a brief description of the activity of the Portuguese Competition Authority in the fuel sector (liquid and gas). It is then structured in two parts. The first (Part A) analyses the sector of liquid fuels for road uses; the second (Part B) looks at bottled propane and butane.

The report describes the way these sectors function, specifically addressing the price formation mechanism and analysing their structural features As in many other

countries, these sectors are characterized by oligopolistic markets with an atomistic demand for the most part and a low demand-price elasticity.

Two issues of concern are therefore given particular emphasis in this Report: (i) what are the characteristics of the value chain, which runs from purchase of crude, through the purchase and sale of derivative products ex-refinery (domestic and international) and imports, storage and transport of refined products, wholesale operations and retail sales at service station forecourts (on and off the motorways in the case of liquid fuels); and (ii) an analysis of price changes, both domestic and internationally, with a comparison involving the UE27 and, in particular, Spain, before and after tax. The analysis extends over recent years and includes two wide-ranging econometric studies.

4.1. Characteristics of the value chain – structural features

Liquid fuel for road use

As previously mentioned, one of the priorities of the Portuguese Competition Authority in the present Report consists in describing the sector's value chain. This runs from purchase of crude, through the purchase and sale of derivative products ex-refinery, imports, storage and transport of refined products, wholesale operations, and retail sales at service station forecourts (on and off the motorways in the case of liquid fuel).

Portugal imports all of the raw material, so local activities involving oil companies are all downstream.

In terms of refining, there is one company (Galp) which owns the only two refineries (Sines and Leça da Palmeira) in the country. In 2008, these refineries supplied 93% of the gasoline consumed and 81% of the diesel. The remainder came from refined produced externally sourced (intra- or extra-community). Imports were fundamentally made by Galp and the other oil companies operating in the country (Repsol, BP and Cepsa). Galp is vertically integrated, incorporating both wholesale and retail activities.

In terms of storage (imports and secondary distribution) and pipeline transportation of refined products, there is a high degree of concentration, for historical reasons

and reasons related to the size of the economy. Galp owns more than 50% of the capacity of import/refinery depots in the north of the country and more than 75% of those in the south. The main secondary distribution infrastructure for refined products and the only one connected by extensive pipeline to the Sines refinery is owned by CLC (Companhia Logística de Combustíveis). The shareholders of this company are Galp (65%), BP (20%) and Repsol (15%).

The structure of the storage market has an impact on the supply to wholesale markets. This supply is fundamentally ensured by the four oil companies operating in Portugal, and accounted in volume terms for 90% of the sales of gasoline and 95% of the sales of diesel in 2008. Demand at this level comes from big clients, among them the oil companies, independent operators, supermarkets and major end users such as companies with transport fleets.

In retail sales of liquid fuels for road uses in service stations off the motorways, there are three types of operator: (i) the oil companies (Galp, Repsol, BP and Cepsa) vertically integrated; (ii) independent operators with their own networks of forecourts (for example Azória, AVIA, Cipol and Alves Bandeira); and (iii) supermarket chains (Intermarché, E. Leclerc, Modelo-Continente, Jumbo, Lidl and Jerónimo Martins). In service stations on the motorways, subject to bigger demands in terms of competition for concessions, investment and operating costs, only the four oil companies can be found.

In 2007 and 2008, the total sales volume in service stations off the motorways was broken down as follows: the brand oil companies, 83,7% in 2007 and 80.3% in 2008; independent operators, 7.3% in 2007 and 7.7% in 2008; and supermarket chains, 9.0% in 2007 and 12.0% in 2008. There has been a 3 p.p. increase in the market share of the supermarkets, part of which has been due to the fact that the chains were offering prices around 9 cents per litre lower in 2008. These operators worked to a commercial strategy that focused more on prices.

Bottled gas used as fuel

Domestic refining has less importance as a source for supply of these fuels. On average around 2/3 of LPG consumption in the country is imported, the remainder being produced in the Sines and Matosinhos refineries.

Secondary distribution is covered by Galp, BP, Repsol and Esso through a network of first line distributors, who operate nationwide. The contracts for this service are for exclusive distribution. The first line distributors sell directly to the end user or to a network of second-line wholesalers, either with or without exclusive contracts. Among these are small-scale businesses such as mini-markets, grocer´s stores, shops that sell household appliances, cafeterias and service stations). These sell direct to the end user.

There are major hurdles standing in the way of penetration in this stage of the chain for sales of bottled LPG. They include transportation costs, economies of scale, the need for storage facilities, access to infrastructures, and a network of distribution contracts, gaining customer loyalty and coping with a high level of losses and damage.

On the mainland, retail sales are shared almost exclusively between the four oil companies (Galp, BP, Repsol and Esso), and between these, the two biggest have a market share which has been sable at around 72% over the past decade.

4.2. Prices of liquid fuels at the domestic level (and international comparisons) at the various stages of the value chain

Liquid fuels for road uses

As already mentioned, one of the Portuguese Competition Authority's priorities in this Report is to set out an analysis of changes in domestic and international prices (UE27 and Spain), before and after tax, covering recent years and a range of products. This includes comparisons based on data published regularly by the European Commission on the 27 Member States, and the Portuguese Competition Authority itself carried out two wide-ranging econometric studies.

Since both diesel and gasoline are tradable commodities, their ex-refinery prices do not depend solely on the price of crude oil and the costs of domestic refining, but also on the prices at which the buyer can acquire the product at other refineries, plus transport costs and other relevant spreads linked to the storage location in Portugal.

The changes in ex-refinery prices for both types of fuel for road use in Portugal reflect fundamentally the changes in international reference prices (*Platts* NWE), with differences resulting from the formula used to define ex-refinery prices at Sines and Leça da Palmeira refineries. Since the start of 2008, the ex-refinery price is fixed on every Wednesday and is identical to the average *Platts* prices for the fuel in question and for the days from Monday to Friday of the previous week, these prices being converted into euros using the euro/dollar rate of exchange published by the European Central Bank.

From the analysis undertaken, it is clear that during 2007, the differentials between the average pre-tax prices and the ex-refinery prices for both types of fuel are relatively constant, at around 12 cents per litre. During 2008, the differential between the pre-tax price and the ex-refinery price for 95-octane gasoline went up by 0.8 cents per litre and by 1.5 cents per litre for diesel for road use. Domestic pre-tax prices therefore continue to track closely the ex-refinery prices, that is, the *Platts* NWE quotations, with the lag already mentioned, this being a scenario common to other countries in the European Union.

As for recommended retail prices, the analysis undertaken shows that there were changes in prices for 95-octane gasoline and for diesel for road use among the oil companies during 2007 and 2008 sufficient to confirm the existence of parallel behaviour.

The changes in the recommended retail prices reflect above all the changes in ex-refinery prices and in retail margins. During the whole of 2007 and the first half of 2008 there was a continuous and relatively constant increase in recommended retail prices for gasoline and diesel for road use, as also happened in the ex-refinery prices for both types of fuel. In the second half of 2008, recommended retail prices came down abruptly, again in tandem with ex-refinery prices.

In percentage terms, the range in recommended retail prices is always lower than for ex-refinery prices, given that retail prices include the special tax on fuel (ISP) and ex-refinery prices do not. The ISP is a specific tax and it is not calculated as a percentage of the price. This cuts down the percentage on changes in ex-refinery prices both when prices are rising and when they are falling.

During 2007 and 2008, the differences in the annual average of daily recommended retail prices among the four oil companies were not statistically relevant. On the other hand, independent companies are not in a position to offer prices that are

lower than the oil companies, and follow retail prices closely. In fact, they end up with a pricing strategy very similar to operators of the DODO[2] type in each of the oil companies.

In terms of the average daily prices charged by three of the biggest independent operators, the average difference between them and the daily average of the four oil companies recommended retail prices was (i) zero in 2007 and only one tenth of a cent per litre in 2008 for 95-octane gasoline and (ii) zero in 2007 and 2008 for diesel for road use. The differences between the three independent operators themselves are also very slight.

The 2008 average for the recommended retail price of gasoline, calculated on a weekly basis, was higher than the annual average for the UE27. The difference in absolute value between the figure for Portugal and the average for the UE27 was around 7.9 cents per litre. In terms of diesel for road use, the average figure for the retail price was lower than for the UE27. The difference in absolute value between the figure for Portugal and the average for the UE27 was around 1.33 cents per litre.

On average, in 2007, the differential between domestic average pre-tax prices and the EU27 average was 1.45 cents per litre for 95-octane gasoline and 1.08 cents per litre for diesel. In 2008 this differential was 2.75 cents per litre for 95-octane gasoline and 2.41 cents per litre for diesel.

On average, in 2007, the differential between domestic average pre-tax prices and those in Spain was 1.03 cents per litre for 95-octane gasoline and 0.26 cents per litre for diesel. In 2008, this differential was around 0.83 cents per litre for 95-octane gasoline and 0.90 cents per litre for diesel.

There are two econometric studies that are part of this report, and they provide a solid empirical back up for the analysis of how the prices of various products changed. The first analyses the parallel behaviour in the way that retail prices are fixed in more than two thousand service stations during the period between 2004 and 2006. The second looks at the relationship between the prices of crude (*Brent*), the international reference prices for liquid fuels (*Platts* CIF NWE) and pre-tax retail prices in Portugal and other Members States of the European Union (EU15). This

[2] See Glossary.

takes in the subject of the asymmetry in the lag and the range of adjustment to changes in prices for the period 2004 to 2008.

In the first study, the analysis only takes in the three-year period 2004 to 2006. This is because the sample available as and from 2007 cannot be compared directly with previous years, since it does not take into account certain elements relating to some of the market operators. It was not possible to standardise this kind of data relating to retail prices, broken down for 2,016 service stations and for different types of fuel. The results suggest, however, that if the two more recent years were included, namely 2007 and 2008, the conclusions of the analysis would not be markedly different.

The second econometric study is more thorough than presented in the interim report of December 2008, and confirms the existence of asymmetry in the adjustment of *Platts* CIF quotations to *Brent* quotations, as well as in the adjustment to *Platts* CIF of pre-tax prices, diesel and 95-octane gasoline in a number of Member States. In the case of Portugal, the asymmetry is of a one-week time lag, not in the range, that is, average prices before tax is levied at retail level tend to adjust completely to a rise in international reference prices (*Platts*) a week earlier than they adjust to a fall. This study concludes in fact that domestic average pre-tax prices for diesel and 95-octane gasoline adjust with a lag of 4 to 5 weeks to an increase in *Platts* CIF NWE and 5 to 6 weeks to a fall.

This phenomenon, characterized by a non-immediate adjustment between prices, has been observed in several markets. It is not necessarily a competition issue, above all where there are markets in tradable goods, as is the case here.

Moreover, the non-immediate adjustment tends to be viewed in a positive way in periods when there is a rise in prices, but negatively when there is a fall. This happens when some asymmetry is perceived between a rise and a fall in prices, even if fundamentally it derives from an outside source, as happens in Portugal and in other Member States.

Bottled gas as fuel

The average monthly ex-refinery prices for butane and propane moved in a way similar to international prices used as a reference (*Platts* FOB NWE) in 2007 and 2008.

Domestic prices before tax and average retail prices of butane and propane are the lowest in a group of countries where prices are not regulated and higher than where such regulations exist, among them Spain, Belgium and Luxembourg. The comparison with Spain, therefore, is not relevant in terms of prices, since market prices and regulated prices cannot be compared. Also, the technical specifications are different, being more stringent in Portugal than in Spain.

5. Questions of a competition nature that are the subject of Recommendations by the Portuguese Competition Authority

This report has identified certain competition related issues along the value chain in the liquid fuels and bottled gas sectors. There are features related to structure, regulations and conduct that have warranted recommendations here.

In these sectors, a stronger market contestability depends a great deal on structural and regulatory features. Among these there need to be conditions that make it possible for existing and potential rivals to have recourse to derivative products from outside the country (imports from outside the community or intra-community operations). This means access to port and storage infrastructures on a level playing field. A stronger market contestability also depends on improving the conditions for access to secondary storage and to transport (by pipeline or sea, road or rail).

In structural terms, the Portuguese Competition Authority has found a number of factors hampering access to logistics infrastructures (such as ports, pipelines, and storage depots), limiting the capacity of market operators to make imports.

For this reason, it is important to put investment already planned into the country's ports to boost private initiative in operating and provide access to storage areas which can be used for imports and are at present underused or with the potential for upgrade.

As a concrete point, there are certain infrastructures belonging to the CLC (the Portuguese acronym for Companhia Logística de Combustíveis, S.A, which owns the only major oil pipeline operating in Portugal) which have a key role to play in the distribution of fuel, and these could be regulated in terms of access and use of premises (pipeline and storage facilities), so that a wider range of operators could make use of them, as long as they fulfill the conditions – regulatory, safety and physical – necessary for the purpose.

In order to promote competition at retail level, it is important to continue to streamline the licensing processes for service stations, provide incentives for more outlets run by supermarket chains, and insist on having alternate operators for new concessions or the renewal of already existing concessions for service stations on motorways.

Competition would also be fostered by providing more freedom for economic agents to set retail prices reducing the dependence of retail prices on bulk prices.

Finally, up-to-date retail prices must be made public, and they must be visible and transparent for consumers, with more inspections to ensure compliance with the obligation to indicate retail prices for all types of fuel and improvements in the mechanisms of information to the public. This is also relevant for demand in retail sales.

1. Recommendations

Given everything described and analysed throughout this Report, the Portuguese Competition Authority (henceforth PCA) believes it should recommend structural, regulatory and behavioural measures relating to the situations identified as more capable of improving competition in the markets involved. Some of the measures mentioned are designed to reinforce previous recommendations by this authority. The PCA, therefore, recommends adoption of the following measures:

Measures of a structural nature

1. The PCA is aware that there are obstacles hindering access to logistic infrastructures (for example, ports, pipelines and storage depots) and these limit the capacity of market operators to import fuel for road use.

2. Bearing this in mind, it is important in the north of the country to:

   - Ensure that the development for the liquid bulk cargo terminal in the port Aveiro goes ahead. This is the responsibility of the Aveiro port authority (APA), in the terms and in the time frame (2009) set out for the project, having concern, among other things, for matters relating to movement, loading and discharge of fuel for road use from tankers (the relevant size being above 30 thousand tons);

   - Ensure the concession of land in the port of Aveiro with suitable areas, capable of including fuel storage depots which make a substantial increase possible for the import depots planned for the site, with the necessary connections by pipeline. It should also be considered barring the operator with a dominant position in terms of import depots and secondary distribution from participating in the bid for this concession;

   - Streamline the licensing process for possible future expansion of the import depot facilities connected to the port of Aveiro.

3. In the south, bearing in mind the importance of the port of Sines[3] for discharge of diesel for road use and other fuel from large tankers of above 30 thousand tons, it is important to:

[3] It is almost certainly more difficult to expand the capacity for importing fuel for road use through the port infrastructures of Lisbon and Setúbal (existing or to be built).

- Ensure that the Sines port authority (APS) puts out an international public tender for a concession of a sizeable area (capable of taking at least 200,000m^3 and with the possibility of expansion) for import depots in Sines, connected to the port and to the pipeline of the CLC (acronym in Portuguese for *Companhia Logística de Combustíveis S.A.*);
- Ensure that in this public tender authorisation is not given for participation by the operator with a dominant position in terms of the import depots and secondary distribution in the south of the country.
- Ensure a pipeline connection from the depots to be built on this site to the loading bays of the TGLS (acronym in Portuguese for *Terminal de Granéis Líquidos de Sines*), with a fully operational and non-discriminatory connection into those currently existing for the refinery depots;
- Ensure a pipeline connection between this storage area and the CLC pipeline;
- Ensure that the process to clear access to and use of the CLC pipeline in the Sines-Aveiras connection is regulated in an independent way, in accordance with a code which is not based on elements that maintain positions and volumes of discharge for specific companies and which can handle discharge from large tankers;
- Ensure that it is possible to use adequate storage facilities in the Aveiras complex (already existing or to be built with connection to the pipeline), so as to definitively have in place the infrastructure needed for the import process through the port of Sines to take place on competitive terms;
- Ensure that the commercial terms for access to and use by third parties of the CLC pipeline and related storage are non-discriminatory, transparent and cost-oriented, with the operation overseen by an independent body.

Measures of a regulatory nature

4. Provide the regulatory framework for Decree law no. 31/2006, of 15 February, relating to the national oil system (*Bases Gerais da Organização*

the Funcionamento do Sistema Petrolífero Nacional, or SPN). This should cover, among other things, all those stipulations where there is no legislation in place, especially for norms which deal with: *(i)* the possibility of access by third parties to available capacity in the large storage facilities, and to transporting and distributing by pipeline, considered to be in the public interest, in terms that are non-discriminatory and transparent (cf. Article 24 of the Decree law) and, *(ii)* use by third parties of the logistical operations centres (Centros de Operação Logística) (*cf.* Article 23 of the Decree law).

5. Simplify the regulatory framework (Article 10 of Decree law no. 10/2001, of 23 January, in the wording of Decree law no. 339-D/2001, of 28 December), which sets down the provision that organisations obliged to have their own reserves of crude should be allowed, for reasons of *force majeur*, to replace this obligation (totally or partially) by payment of the corresponding amount to the body that manages the strategic oil reserves (*Entidade Gestora de Reservas Estratégicas de Produtos Petrolíferas* E.P.E or EGREP is a State agency which ensures compliance with compulsory stock obligations, maintaining the whole or part of such stocks.). Conditions should be created to make this a more standard occurrence, and not be limited to reasons of *force majeur*, and so in this way, the need for liquidity in the market for storage capacity is better covered, thus making it easier for independent bulk operators to compete;

6. Speed up the finalisation of intergovernmental agreements so as to be able to bring about the possibility of setting up reserves in other member states, creating more supply in the storage market, thus making it possible for operators to work within more competitive terms.

7. Continue to ensure that there are more practical effects to be seen from the efforts to simplify the procedures for licensing service stations for fuel. The legislation for this is in Decree law no. 195/2008, of 6 October, which amends Decree law no. 267/2002, of 26 November, and reduces the time needed for procedures so that competition at retail level is fostered through the fact that there are more outlets where fuel for road use is available for the public.

8. Include the possibility of supermarkets putting in a supply point for a service station when requesting a licence for a site and indeed make this a positive factor in favour of their proposal. The aim of this is to encourage retail

chains to set up and run service stations near shopping parks (hiper and supermarkets).

9. Bolster enforcement procedures covering service stations off the motorways, with a view to them complying with the obligation of indicating prices for retail sales of all the fuel sold at their outlet, with placards clearly visible from the public thoroughfare, so as to allow the consumer to make a choice without actually going in.

10. Bolster the recommendations previously made by the PCA[4] that tenders for new concessions or renovation of concessions for service stations on the motorways should ensure that different operators run consecutive service stations, whenever this is likely to be of benefit to the consumer.

11. Further to this, there should be consideration given to a reduction in the length of the concessions for service stations on the motorways to the extent that very long periods can contribute to foreclose the market.

12. In terms of gas used as a fuel, Law no. 9/86, of 3 April did not include revocation of the stipulations governing settlement of VAT after liberalisation of prices for LPG from 3 September 1990. The regime in force applies to the sale of these fuels and states that it is the distributors who pay the VAT, calculated on a formula that presupposes administrative control over prices. Given this, the recommendation is that this special tax regime should be revoked and the standard regime for paying VAT introduced, in the same way as it was when pump prices for liquid fuels were liberalised. The regime in force demands an estimate of the distributors' sales margins, and this is added to the price on which VAT is levied. The need to estimate a bulk margin and consequently a figure for sale to the public could bring about a situation where retail prices charged inter- and intra-brand are levelled out. This is not desirable in a market with liberalised prices since it can hinder competition in prices at various stages, specifically in the retail business.

13. Again alert the associations representing the sector, such as the National Association of Oil Companies (*Associação Portuguesa de Empresas Petrolíferas* or APETRO) and the National Association for Fuel Wholesalers (*Associação Nacional de Revendedores de Combustíveis* or ANAREC), that they cannot pass on in any way, for example in the media, any intention to

[4] See the Report of June 2008, section 7.2. as well as Recommendation by the Portuguese Competition Authority no. 3/2004 in "The liquid fuels sector".

change retail prices or any other variations (whether increases or decreases).

Measures of a behavioural nature

14. The measures recommended in this field involve actions from government, the General Directorate for Energy and Geology (*Direcção Geral de Energia e Geologia* or DGEG) and oil companies operating in Portugal.

15. The government should put every effort into checking and updating the information on pump prices currently available on the DGEG Internet site, so as to ensure that the consumer is supplied with information in real time.

16. The DGEG should increase the flexibility of this platform, so as to allow information on prices and places to be transmitted automatically to mobile equipment (for example GPS, PDA's,…).

17. The oil companies operating in Portugal should review the commercial policies they use for reference and/or recommended prices, so that in the definition of prices for sales to customers and/or wholesalers, these policies, together with the calculation of discounts, bonuses, wholesale margins and so on, do not lead to fixed or minimum pump prices.

2.Framework of the Final Report

2.1. The work of the Portuguese Competition Authority in the fuel sector

2.1.1. The remit of the Portuguese Competition Authority

18. The statutes of the PCA were approved in Decree law no. 10/2003, of 18 January 2003. Its mission is to ensure that competition rules are applied in Portugal, that there is respect for the principle of a market economy and unfettered competition. The purpose is to see to the efficient running of the markets and the proper distribution of resources, in pursuit of consumer interests.[5]

19. To carry out this mission, it is incumbent on the PCA, among other things, to:

- Ensure that laws, regulations and decisions are being followed, as they relate to promoting defence of competition;
- Foster the adoption of practices that promote competition and the spread of a competitive culture among economic agents and the public in general;
- Publish guideline considered relevant to competition policy, especially among economic agents;
- Contribute to improving the framework of standards in Portugal in all areas where they can affect competition levels, either on its own initiative or at the behest of the government.

20. To carry out its remit, the PCA has the power to levy sanctions, to supervise and to draw up regulations and issue recommendations.

21. In terms of its power to sanction, it is incumbent on the PCA, in particular, to: (i) find and look into practices which may infringe domestic and community competition legislation, draw up its case and decide on the correct procedures, with the levying of sanctions as set down in the law, as the case may be.

[5] See Article 1 of the Statutes of the Portuguese Competition Authority, approved through Decree law no. 10/2003, of 18 January.

22. In terms of its supervisory powers, it is incumbent on the PCA, among other things, to carry out studies, surveys, inspections and audits on competition issues, should they be deemed necessary.

23. Within the scope of its regulatory powers, the PCA can, among other measures, issue regulations and general directives.

2.1.2. Actions undertaken and in progress

2.1.2.1. Regular monitoring of the market

24. The fuel sector was totally liberalized at the start of 2004,[6] and the PCA started immediately on a process of regular monitoring of the market, within the scope of its above-mentioned supervisory powers.

25. As part of the process, it gathered information on structural features; it also started a monthly system of monitoring prices for sales and purchases, per company, at the various stages in the sale of fuel; it kept a watching brief on the international quotations for the raw material (crude/Brent) and refined products; and it checked on the international indices of refining margins (for example, Platts ARA/NWE).

2.1.2.2. Recommendation of the Portuguese Competition Authority No. 3/2004 on "The liquid fuel sector"

26. With the same purpose in mind, the PCA carried out an analysis of the way competition worked in the market, identifying barriers to entry, above all those stemming from administrative or legal procedures, as well as structural constraints that can limit competition.

27. As a result of this analysis, the PCA deemed that it was necessary and urgent to take measures that would stimulate and bolster competition in the sector.

28. It therefore decided that it was the right time to recommend to the government that it should take the necessary regulatory changes in hand, and also set out new legislation that would make it possible to create conditions to foster and boost competition in the sector.

[6] Executive order no. 1423-F/2003, of 31 December, liberalised the retail prices of 95-octane unleaded gasoline, of diesel for road use and of diesel coloured and marked.

29. Thus it was that Recommendation no. 3/2004[7] was drawn up in November 2004, with various proposals to the government with a view to creating conditions for the strengthening of competition in the sector. Among the measures proposed, the following stand out:

✓ ***Access to essential logistics infrastructures***

- "*The concessions for and/or ceding of operations in the port terminals allotted to or with the possibility of being allotted to the transport of fuel should always be by way of public tender, ensuring that the award of the contract does not create or reinforce a dominant position in the market".*
- "*Selection should be based on a transparent and non-discriminatory process, with objective and easily verified criteria.*"
- " *To the same end, any form of ceding such facilities that may be used for the storage of fuel in the public domain (storage tanks or land) should be carried out through a process that is open to all those who may be interested and based on competition criteria.*"
- "*In any of the situations mentioned above, the period of adjudication should not be excessive, and limited to the minimum that could be expected in the light of the underlying investment, preventing in this way the restriction on competition inherent in the closing of the market that would ensue would be disproportionate to the aims*". (The restriction on competition from closing out the market is to be avoided if the disadvantages of long-term contracts outweigh the advantages)

✓ ***Setting up service stations open to the public – Changes to regulations***

- "*Changes are proposed to Portaria (i.e., Ministerial Regulation, Executive Order or Order in Council) nº 131/2002, of 9 February, so as to eliminate all the stipulations that hinder unfettered competition by making access to the market*

[7] Available on: http://www.concorrencia.pt/Conteudo.asp?ID=258.

impossible for certain categories of operators, specifically large retailers (i.e., hiper and supermarkets);"

- "*The safety requirements for setting up service stations should be objective, universally applicable, non-discriminatory and transparent;*"

✓ ***Setting up service stations on the motorways***

- "*Contracts for concessions on the motorways and/or SCUTs (major inter-city roads, initially toll-free), should oblige the concessionaire to make sub-concessions of service areas based on competition criteria, so as to prevent the creation or reinforcement of dominant individual or company positions on each side of the motorway."*
- "*There should be guarantees that consecutive service stations on the same motorway and/or SCUT should be ceded to operators with different brands."*

✓ ***Affixing pump prices – new regulations on transparency***

- "*It should be mandatory, and expressed as such in law, to affix in a way that is clearly visible to the motorist, the pump prices charged for all the fuel for sale, in all the service stations open to the public.*"
- "*Affixing prices, under the terms of the previous point, should be by means of placards placed on the public thoroughfare, outside the service station, so as to allow the consumer to make a choice before going in.*"
- *"In the case of motorways and SCUTs, the prices charged by the service stations should be specified on placards at the main entrances and at distances to be defined in law."*

30. Of the measures recommended, some have been taken on by the government, with legislation that has since been passed and officially published.[8]

[8] See *(i)* Decree law no. 170/2005, of 10 October with the wording of Decree law no. 120/2008, of 10 July, *relating to rules applicable to the indication of retail prices in service stations off and on the motorways*, *(ii)* Executive order no. 362/2005, of 4 April, *which changed the regulations for construction and operating service stations selling fuel,* appended to Executive order no. 131/2002, of 9 February, *authorising the opening of service stations selling fuel in sensitive areas sensíveis;*

2.1.2.3. Inquiries into the fuel sector

31. Following the news in the press of possible problems on competition in the systems for distribution of fuel for public consumption through the network of service stations of the oil companies, disseminating the opinion that these situations could be acting as a barrier to the benefits for consumers deriving from the liberalisation of prices, and stemming specifically from the expected increase on competition between companies, the PCA decided to start out with 7 inquiries on the various types of vertical agreements existing between the oil companies and wholesalers for the oil companies.

32. The PCA also made another inquiry because of signs pointing to parallel conduct between the oil companies in mainland Portugal relating to the retail prices (PVP) of liquid fuels for road use (gasoline and diesel) and between the respective average gross margins in the retail business, with these margins defined by the differential between the average price of retail sale before tax (pre-tax prices) of each brand and the respective average cost of purchasing the product ex-refinery, since there may be here an infringement of clause 1 of article 4 and/or article 6 of the competition law, in the production, distribution to service stations and/or sales of liquid fuels for road use.

2.1.3. Publications of the Portuguese Competition Authority

2.1.3.1. Newsletters

33. As part of its regular monitoring of the liquid fuel market, the PCA started publishing a quarterly Newsletter[9] in 2004, with an analysis of moves in the average retail price of fuel in Portugal and in the EU, before and after tax, as well as with moves in the quotations for the raw materials (crude/Brent) and of indexes relating to refining (Platts).

34. From 2005, the publication also included data on prices and quotations for bottled gas (butane and propane).

35. Through the *Newsletters* therefore, it has been possible to keep a close watch on quarterly moves in the main indicators giving market prices of fuel

and (iii) Decree law no. 195/2008, of 6 October *streamlining the process of licencing service stations selling fuel.*

9 *Cf.* http://www.concorrencia.pt/Publicacoes/Newsletter.asp

(liquid and gas), the international quotation for the raw material (crude/Brent) and the international quotations used as a reference for refined products (diesel and unleaded 95-octane gasoline) in North Western Europe. These included the data published by the North American agency Platts for the ARA area ("Amsterdam – Rotterdam - Antwerp") known as "Platts NWE CIF"[10] quotations, average pump prices (the average retail price), before and after tax, comparisons between Portugal and the remaining member states of the EU, as well as retail prices after tax charged in Portugal, with a regional breakdown using the samples from the DGEG (Direcção-Geral da Energia e Geologia).

2.1.3.2. Report on the fuel market in Portugal (June 2008)

36. Following a request from the Minister for the Economy and Innovation for an analysis to be carried out on how the price of fuel in the retail business was reached, the PCA produced its report, made public on 2 June 2008, called *Report on the fuel market in Portugal.*[11]

37. The above-mentioned Report gives a brief description of the domestic oil sector, an analysis of the conditioning factors in the way that prices for liquid fuel are reached (95-octane gasoline and diesel), an analysis of moves in the prices of crude, the euro/dollar exchange rate relating to gasoline and diesel between July 2003 and April 2008, and a more detailed analysis of how pump prices were reached in the first four months of 2008.

38. From the work carried out then it was possible to draw the following conclusions, among others:

- " *When the tax element is factored out, around 80% of the recommended pump price stems from the ex-refinery price, with the logistical element (storage and transport) not accounting for more than 3.5%";*
- *" Given the parallel nature of average ex-refinery prices for diesel (Platts NWE CIF Rotterdam) and 95-octane gasoline (CIF Rotterdam and the New York price), it is not possible to conclude that pre-tax recommended*

[10] There are two Platts quotations used as a reference for fixing ex-refinery prices in Europe: one is Platts NWE for ARA or north west Europe (known as NWE) and the other is Platts MED for Lavera (France) / Genova (Italy), used as a reference for the Mediterranean area.

[11] *Cf.* http://www.concorrencia.pt/download/AdC_Relatorio_Petroliferas_02-06-2008.pdf

pump prices for these liquid fuels since the start of the year are domestic in origin";

- *"There is a statistically null differential (excluding tax) in recommended pump prices as between Portugal and Spain for both diesel and gasoline";*
- *"This Authority does not have substantive information, made up of coherent and accurate facts, allowing it to draw the conclusion that there exists a violation of Article 4, Clause 1 of the Competition Law and/or Article 81 of the EC Treaty. There are no unequivocal indications of parallel behaviour, nor is it possible at the moment to exclude the conclusion that any parallel behaviour may be merely intelligent adaptation of strategic behaviour to structural conditions in the market";*
- *"This Authority also considers that there is no evidence that one or more of the economic agents involved have charged excessive prices within the terms of Article 6 of the Competition Law and/or Article 82 of the EC Treaty".*

39. Along with these conclusions, there were recommendations put forward with the aim of contributing to finding solutions which, from a short-term perspective, would improve competition in the market of liquid fuel. Among them, the following are worth a mention:

- "***Fast-tracking the licensing of gasoline pumps,*** *reducing considerably the time and cost for new operators to penetrate the market and putting due competitive pressure on companies with higher prices";*
- *"**Changing the licensing for large-scale commercial operations,** with the siting of gasoline pumps at these premises a special factor to be taken into consideration during the licensing process";*
- *"**Changing the licensing for gasoline stations on motorways,** leading to the break-up of a mono-sequence of operators";*
- ***"Information to the end consumer in the retail market –** The PCA recommends that placards be placed indicating the prices charged in the service stations";*
- ***"Access to logistics infrastructures –** The continued adoption of legal instruments that allow for operators in the logistical field to exploit port*

facilities available for public service. There should be an international public tender for this, with a concession structured for public service. There should be competition in the access infrastructures so that the operators here are as efficient as possible and there will be lower logistical costs associated to the import and handling of refined products in Portugal Assurance that there will be no unjustified restraints on the storage of liquid fuels".

40. Apart from the recommendations mentioned above, emphasis was also placed on the importance of giving an impulse to detailed assessment and debate on energy policy in Portugal, within the scope of a wider economic policy, readying for the process of laying the foundations for a real reduction in the country's vulnerability to international fluctuations in the prices of crude.

2.1.3.3. Interim report on the sectors of liquid fuels and bottled gas in Portugal (December 2008) [12]

41. The Report on the fuel market in Portugal of 2 June 2008 clarified, among other issues, the way retail prices of gasoline and diesel were reached, as well as their relationship with moves in the international quotations for crude and for refined products and the euro/dollar exchange rate. Following this, the PCA took the initiative of putting together a more detailed analysis. With this in mind, in July 2008 it asked various organisations involved in these markets to send an additional batch of substantially wider information on the way the markets in liquid fuels and gas worked, covering the stages in the vertical chain from production/import to sales to the public.

42. This information began to be reported on a monthly basis from 30 September 2008 and made this detailed analysis possible.

43. The idea behind these requests for additional information was to have a broader time frame than the one used for the June Report on the conduct of bulk markets (wholesalers) and the retailers of liquid fuels and bottled gas in Portugal, and also on the recent moves in the international markets for crude and refined products.

[12] The Interim report was made available on 16.12.2008 and can be accessed on: http://www.concorrencia.pt/download/AdC_Relatorio_Combustiveis_Liquidos_Gas_Engarrafado_em_Portugal.pdf.

44. The various operators and organisations in the sector which were asked for information included the oil companies, independent operators, large distribution groups with service stations and also organisations such as ANAREC, plus various public bodies (DGEG and the regional directorates of the Ministry of Economy and Innovation, or MEI), port authorities, motorway concessionaires, public companies (EGREP, E.P.E - EGREP is a public corporate entity whose role is to build up and maintain the "strategic" portion of the emergency stocks of petroleum and petroleum-products and the Institute for Roads, or *EP - Estradas de Portugal, S.A.*), fuel storage companies and wholesalers of bottled LPG.

45. As mentioned above, the December Interim Report on the liquid fuel and bottled gas markets covered a longer time span (generally speaking up to September 2008, but whenever possible to October or November). This provided a more extended framework than the June Report on the bulk markets and retailers of liquid fuels and bottled gas. It also provided more detail on recent moves in the international markets for crude and refined products; and there was also a new analysis into the lags and asymmetries in the changes occurring in domestic prices compared with international reference prices.

46. After a brief introduction to the main economic arguments on the phenomenon of temporal asymmetries in the adjustment of retail prices to changes in bulk prices and the raw material, the Interim Report analysed the moves between the quotation for Brent one-month futures, NWE CIF prices and domestic pre-tax prices (average prices before tax) for 95-octane gasoline and diesel from the start of 2004 to October 2008, setting up a preliminary econometric analysis for Portugal on the subject of asymmetries in the changes of prices when they are rising and when they are falling.

47. This econometric analysis shows that a shock, positive or negative, on the quotation for Brent one-month futures takes between 4 and 5 weeks to have a complete effect on the domestic pre-tax prices of 95-octane gasoline and more than 5 weeks on the domestic pre-tax prices of diesel. The preliminary results of the econometric analysis also show that the biggest part of the asymmetry in the transmission of the changes in the quotation for Brent on pre-tax prices in Portugal is international in origin, and stems from the relationship between the quotations used as a reference for the raw material (Brent) and the refined products (CIF NWE).

48. To sum up, the Interim Report aimed fundamentally at reaching three objectives: (i) to disseminate the economic, statistical and (preliminary) econometric analysis, and share the relevant information available up to September 2008; (ii) to present more data to contribute to a better understanding of the way these markets work; and (iii), to contribute towards detecting and clarifying issues that are relevant to the mission of the PCA.

49. As for the first aim, the contents of the Interim Report and the Newsletter on fuel in the 3rd quarter of 2008 require no further comment. As for the second aim, the Report, apart from providing a more thorough analysis of the markets for liquid fuels and bottled gas than was possible in the Report of June 2008, also provides new data that make it possible to check whether previous analyses undertaken by the PCA did in fact reflect the true situation.

50. As for the third aim, the information provided in the Interim Report contributed to a better understanding of the features of the distribution chain of liquid fuels and bottled gas, of moves in the respective prices and margins and of the way that time had an influence on the adjustments in retail prices of liquid fuels to changes in the international quotations of the raw material and of refined products.

51. Over and against this, it was not the aim of the Interim Report to draw conclusions, because they could never be definitive, based on an analysis of these markets, since this needed a more detailed treatment in terms of the period covered. This could be reached by the inclusion of the whole of the second half of 2008, with validation of the econometric results obtained and of the characteristics of the structure of these markets, among other things in terms of storage, logistics and distribution networks.

52. This additional analysis is presented here, in this Final Report.

2.2. Purpose of the Final Report

53. This Report follows the June Report and the Interim Report of December mentioned above, and was put together because of the need to deepen the study and extend the time covered by the earlier analysis.

54. The Final Report presented here therefore describes the structural characteristics of the sector of liquid fuels for road use and the market for gas as fuel in Portugal, with particular emphasis on issues related to logistics connected with storage and the transport of products as well as the siting and characteristics of service stations for public use, identifying and assessing the main issues in the competitive sphere arising from the way the markets work. In so doing, it provides an in-depth analysis of these markets and covering a longer time span.

55. The analysis of liquid fuels for road use (Part A of the Report) covers only diesel (for road use) and 95-octane gasoline (euro super 95), in mainland Portugal. The reasons for this are that these products are the most relevant in terms of final consumption, and they serve as a reference for the other liquid fuels for road use (98-octane gasoline and the new generation of diesel for road use), with these last obtained from the first by additive processes.

56. Moreover, this Report analyses more closely the phenomenon of asymmetries in the lag and in the range of price adjustments, among other things, since prices tend to increase more quickly when costs rise than when they fall.

57. Indeed, this phenomenon has led public opinion to suggest that there are anti-competition practices in the sector. For this reason, one of the aims of this Report, apart from providing a complete overview of the sector, is to assess whether asymmetries do indeed exist in how prices are reached and make a detailed analysis of how the domestic fuel market works, identifying possible obstacles in the way of a more dynamic competitive process in the sector.

2.3. Chronology of the Final Report

58. The study which forms the basis for this Report started immediately after publication of the Report of June 2008, with enquiries sent to a range of different entities with a role to play in these markets, the aim being to obtain an additional and substantially enlarged raft of information on the way the markets worked, covering the various stages in the vertical chain running from production/import to sales to the public of liquid and gas fuel.

59. As previously mentioned, the aim of these additional requests for information was to provide a broader framework over a longer term than was used for the Report of last June on the conduct of bulk markets and retailers of liquid fuels and bottled gas in Portugal and also on the recent moves in international markets of crude and refined products.

60. The deadline for conclusion of the study was the end of March of this year; with the PCA presenting an Interim report on 16 December 2008.

61. In this Final Report the following topics were analysed:

a. The international framework of sectors comprising liquid and gas fuel (butane and propane), moves in the international prices and how retail prices are reached in Portugal, with identification of the factors that have the biggest influence on the final price;

b. Structural characteristics of these two sectors, from production/import to retail sales;

c. The existence of possible obstacles in the way of more effective competition along the value chain for both types of fuel;

d. Signs of possible practices/conduct which hinder more competition in the various markets;

e. The occurrence and scope of asymmetries in the lag and range of temporal adjustments of prices of fuel for road use in the EU15 and in Portugal.

2.4. Layout of the study

62. This Final Report includes *(i)* the Executive Summary; *(ii)* two introductory chapters relating to the Recommendations (Chapter 1) and to the Framework of the Final Report (Chapter 2). In the latter, there is a description of the activity of the PCA in the fuel sector, the purpose of this Report, the time lines of its development and its organisation. The rest of this Report is subdivided into two parts: **Part A** – liquid fuels for road use – where the fuel sector for road use is analysed both in structural terms and from the perspective of how competitive it is; and **Part B** – bottled propane and butane – where there is an analysis of this sector in the same way, i.e. both in structural terms and from the perspective of how competitive it is. A glossary will be found at the end of the report.

63. **Part A** is divided into the following Chapters:

- Chapter 3 – Regulatory framework;
- Chapter 4 – The value chain of the sector of liquid fuels for road use;
- Chapter 5 – Analysis of the markets for raw material (crude);
- Chapter 6 – Refining operations and imports of liquid fuel for road use in Portugal;
- Chapter 7 – Storage and transport by pipeline;
- Chapter 8 – Bulk sales operations (off the network) for gasoline and of diesel for road use;
- Chapter 9 – Operations and retail sales in the network of liquid fuels (gasoline and diesel for road use);
- Chapter 10 – Retail sales of liquid fuels for road use on the motorways;
- Chapter 11 – Parallel conduct in determining the pump price in each local retail market and nationally;
- Chapter 12 – Econometric analysis of the relationship between moves in the price of crude and retail prices

64. **Part B** contains the following chapter:

- Chapter 13 – Characteristics of the market for bottled butane gas and propane. This chapter is divided into various sections.

A. Liquid fuel for road use

3.Regulatory framework

3.1. General

65. The liquid fuel sector is not subject to specific legislation from a regulator with sectoral functions, though the various operations along the value chain are subject to an array of regulations of many different kinds (for example: technical, safety, and the environment).

66. In terms of economic regulation, the sector is subject to competition law, whether Portuguese,[13] or EU[14].

67. Over the years, the regulations governing the oil sector[15] have been reformulated a number of times, many of the changes deriving from European Community stipulations. The regulatory framework is fragmented and dispersed, and applies to the whole range of operations in the sector.

68. In 2006, following the Resolution of the Council of Ministers (RCM) no. 169/2005, of 24 October,[16] Decree law no. 31/2006, of 15 February, was published, giving regulatory form to the strategy laid out in that Council's meeting, setting down the overall basis for the organisation and running of the National Oil System (SPN), as well as the stipulations for operations involving storage, transport, distribution, refining and selling and the organisation of markets in crude and products deriving from crude.[17]

69. Article 4 clause 1 of the above-mentioned decree states that "the fundamental purpose of being involved in operations covered by the decree law is to contribute to economic development and social cohesion by ensuring, among other things, the supply of products deriving from crude in terms suitable for the needs of consumers, whether qualitatively or quantitatively."

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13 Law nº 18/2003, of 11 June – Competition Law.

14 Articles 81 and 82 of the EC Treaty.

15 The unified legal regime for the oil sector dated from 1937 (Law no. 1947, of 12 February).

16 This approved the *New Strategy for Energy*, setting out as the main strategy the liberalisation and fostering of competition in the energy markets through a change in the structural framework.

17 *Cf.* Article 1 of Decree law no. 31/2006, of 15 February.

70. Clause 3 in the same article states, "the operations set out in this Decree law are guided by the principles of competition, notwithstanding the fulfillment of the obligations of public service."

71. The obligations of public service are enumerated, as an example, in clause 3 of article 5 of the above-mentioned Decree law, as being "a) the safety, regularity and the quality of supply; b) the protection of consumers; c) the satisfaction of the needs of priority consumers, in, for example, the armed forces and social assistance; the d) encouragement of energy efficiency and the rational use of the resources and oil-based products as well as protection of the environment."

72. Some of the operations that make up the SPN are regulated through the above Decree.[18] They are:

- Refining of crude and the treatment of products deriving from crude;
- Storage of crude and the products deriving from crude;
- Transport of crude and the products deriving from crude;
- Distribution of products deriving from crude;
- Sales of crude and the products of crude.

73. Decree law no. 31/2006 gives details for each of the activities in the previous point, with the types of procedure they are subject to, in terms of access to and operations in the field. The formulation of technical or procedural solutions is left for supplementary legislation. Such legislation has not yet been published, at least as it pertains to the majority of these situations.

74. There will then be an appraisal of the regulatory measures that may have more restrictive effects in terms of competition. These issues relate to rules governing access to the market, pricing regulations and the rules relating to operations.

[18] *Cf.* Article 12 of Decree law no. 31/2006, of 15 February.

3.2. Access to the market

3.2.1. Prospecting for crude in Portugal

75. Access to and the carrying out of operations in prospecting for oil and then producing crude can only be through a concession awarded as a result of a public tender or through direct negotiations.[19]

76. Involvement in these operations is subject to a concession covering every aspect of the business.

77. The contract terms for concessions referred in Decree law no. 194/94, of 26 April were approved in Executive order no. 790/94, of 26 July.

78. Exclusive rights are granted for 8 years, renewable annually twice for prospecting, and they are granted for 25 years extendable to 40 years for production.

3.2.2. Refining

79. According to article 14 of Decree law no. 31/2006, undertaking refining operations does not need a stand-alone licence, depending rather on the licensing of the facilities. It is granted by the Minister of the Economy and Innovation, taking into consideration the level of credibility and the technical, economic and financial capability of the proposer and to what extent the project for the facilities is in line with the national energy policy, with the planning of land use and with the aims of environmental policy, under provisions to be defined in supplementary legislation.

80. Moreover, operations involving the handling of products deriving from crude also do not need a stand-alone licence, but depend on the licensing of the facilities, under provisions to be defined in supplementary legislation.[20]

81. To date, the supplementary legislation has not been published and the setting up of refineries[21] is still governed by the industrial licensing regime (Regime de Licenciamento Industrial), which is set out in Decree law no.

[19] *Cf*. Decree law no. 194/94, of 26 April.

[20] *Cf*. Article 15 of Decree law no. 31/2006, of 15 February.

[21] The classification of economic activities (*Classificação das Actividades Económicas*, or CAE-rev. 2) was approved in Decree law no. 182/93, of 14 May, and considers the manufacture of oil-based refined products an industrial activity.

69/2003, of 10 April, Regulatory Decree no. 8/2003 of 11 April, with the amendments introduced through Decree law no. 183/2007, of 9 May, and through Regulatory Decree no. 61/2007, of 9 May.

82. Whenever the industrial premises are within the grounds of a port, the licence or autorisation for building works, enlargement or change can only be issued following prior authorisation from the body that holds jurisdiction over the area.

3.2.3. Storage

83. Under the terms of Decree law no. 31/2006, involvement in storage operations does not need a stand-alone licence, depending rather on the licensing of the facilities.[22]

84. The licence for large storage facilities is issued by the Minister of the Economy and Innovation and the remaining licences are issued by the competent administrative organisations under the terms of article 33 of the Decree law mentioned above.

85. The award of the licences is made as per the terms of Decree law no. 267/2002, of 26 November, with the amendments that were introduced through Decree law no. 195/2008, of 6 October, and Executive order no. 1188/2003, of 10 October, and with the amendments that were introduced through Executive order no. 1515/2007, of 30 November, with the following bodies responsible for the licensing, depending on the size of the storage facilities:[23]

- General Directorate for Energy and Geology (DGEG) – storage facilities for products refined from crude, in or linked to the port terminals or defined as being of strategic interest for the regular supply of the country; for this, a properly grounded communiqué from the Minister of the Economy and Innovation is required;
- The regional directorates of the Ministry of Economy and Innovation (DRE) – storage of liquid fuels with capacity higher than 200m^3 and/or storage of liquid and gas fuels in facilities where there is movement or filling of recipients and tanker trucks;

[22] *Cf.* Article 16 of Decree law no. 31/2006, of 15 February.

[23] *Cf.* Article 5.

- Town and City Councils – other types of storage.

86. When adjudicating licences for storage, concern should be given to the credibility and the technical, economic and financial capability of the proposer and to what extent the project for the facilities is in line with the national energy policy, with the planning of land use and with the aims of environmental policy.

3.2.4. Transport and distribution

87. The operations of transport and distribution may be by: (i) sea, river, road, rail and (ii) pipelines.

88. The conditions for access to the operations referred in point (i) of the previous paragraph are those applicable to each type of transport in question (ex: the Regulations concerning the national carriage of dangerous goods by road, or *Regulamento Nacional do Transporte de Mercadorias Perigosas por Estrada*, RPE), if there are no specific regulations for the transport and distribution of fuel.

89. In terms of transport and distribution by pipeline, the operations do not need a stand-alone licence, depending rather on the licensing of the facilities. This licence should be subject to consideration of the credibility and the technical, economic and financial capability of the proposer and to what extent the project for the facilities is in line with the national energy policy, with the planning of land use and with the aims of environmental policy[24].

90. Since the supplementary legislation to govern Decree law no. 31/2006 has not yet been published, the licensing of pipelines is deemed to come within the provisions of Decree law no. 152/94, of 26 May and Executive order no. 765/2002, of 1 July.

91. As the regulations relating to licensing previously mentioned relate above all to safety requirements and to the possibility of recognition of public interest in pipelines projects with a view to the application of the compulsory purchase code (the rules governing easement or *Regime de Servidões* and the Expropriations Code or *Código de Expropriações*.)

[24] *Cf.* Articles 17 and 18 of Decree law no. 31/2006, of 15 February.

3.2.5. Access by third parties to infrastructures declared to be of public interest

92. Under the terms of clause 1 of article 24 of Decree law no. 31/2006, those who hold the rights to large storage facilities, transport and distribution by pipeline, with a declaration of public usefulness, are obliged to cede the available capacity in these facilities to third parties, in a way that is non-discriminatory and transparent.

93. Access by third parties to the facilities previously referred is the subject of regulation, according to objective criteria, transparent and in the public domain (clause 4 of article 24).

94. Under the provisions of clause 3 in the same article 24, the criteria for the definition of available capacity will be set out in supplementary legislation.

95. Clause 1 of article 26 of Decree law 31/2006, stipulates that the scope of the regulations covering the operations referred in article 24 will be the subject of supplementary legislation.

96. However, clause 2 of this article 26 mentions that the competencies set out in these provisions are split between the Energy Regulator (*Entidade Reguladora dos Serviços Energéticos* or ERSE and the General Directorate for Energy and Geology, or DGEG, as a function of their remit and under provisions to be defined in supplementary legislation.

97. To date, the supplementary legislation mentioned above has not been published.

3.2.6. Bulk and retail sales

98. As stipulated in clause 1 of article 19 of Decree law no. 31/2006, there is an open market in the sale of crude oil and of the products deriving from crude, though subject to a licence as per the stipulations of this Decree law, along with legal provisions in fiscal and customs matters.

99. Article 20, clause 1 defines those who sell crude oil and the products deriving from crude as (i) those who sell in bulk and (ii) those who sell retail.

100. Clause 2 of article 20 stipulates that the conditions for exercising activities connected with sales are to be set out in supplementary legislation, which

will determine the requirements that are applicable to the activity, as well as the obligations to which they are subject, in terms of, among other things:

- Ensuring regular supplies;
- Disseminating information on prices charged;
- Providing information to the competent authorities.

101. To date, the regulations pertaining to Decree law no. 31/2006 have not been published, though there are regulations covering the setting up of service stations for the sale of liquid fuels to the public.

102. The setting up of service stations is regulated by Decree law no. 267/2002, of 26 November, with the amendments introduced by Decree law no. 389/2007, of 30 November, no. 31/2008, of 25 February, and 195/2008, of 6 October.

103. Portaria (i.e., Ministerial Regulation, Executive Order or Order in Council) no. 1515/2007, of 30 November amends Portaria (i.e., Ministerial Regulation, Executive Order or Order in Council) no. 1188/2003, of 10 October, and regulates the requests for licensing fuel facilities; and Executive order nº 362/2005, of 4 April, amends the regulation governing the building and operating of service stations (Regulations governing the building and operation of fuel supply stations or *Regulamento de Construção e Exploração de Postos de Abastecimento de Combustíveis*) appended to Portaria (i.e., Ministerial Regulation, Executive Order or Order in Council) nº 131/2002, of 9 February, authorising, among other things, the setting up of service stations to sell fuel near "sensitive areas" (large retail premises).

104. When service stations are closed down, the authority responsible for licensing must be informed, so that the operating licence can be cancelled.[25]

105. It is obligatory to make the site of the former service stations safe for people and to ensure that no harm is caused to the environment. This can imply a number of actions by those responsible for the outlet such as the removal of equipment and the decontamination of the land, when such needs to be done.[26]

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[25] *Cf.* Article 16 clause 3 of Decree law no. 267/2002, of 26 November, with the amendments introduced through Decree Law no. 389/2007, of 30 November, no. 31/2008, of 25 February and no. 195/2008, of 6 October.

[26] *Cf.* Article 21, clause 1 of Decree law no. 267/2002, of 26 November, with the amendments introduced through Decree Law no. 389/2007, of 30 November, no. 31/2008, of 25 February and no. 195/2008, of 6 October.

3.3. Regulating prices

106. Article 10 of Decree law no. 31/2006 stipulates that, notwithstanding the rules of competition and the obligations of providing a public service, the prices to be charged are to be openly reached.

107. The completely open market in liquid fuels followed publication of Executive order no. 1423-F/2003, of 31 December, which ended the administrative fixing of maximum prices for sale to the public of 95-octane gasoline, diesel for road use and diesel coloured and marked, with effect from 1 of January 2004.

108. The bulk margin was liberalised through Decree law no. 225/93, of 21 June.

109. Previously, the minimum margin for sales had been fixed in Escudos 4.50/litre (corresponding, in euros, to €0.0225/litre) for premium leaded gasoline and for diesel.

3.4. Regulating operations

110. Operations along the value chain for fuel, given the nature of the products involved, are subject to a number of regulatory norms that cover aspects connected with, among other things, product specification, safety and security and protection of the environment.

111. Some of the most relevant norms in question are detailed below.

3.4.1. Mandatory reserves

112. Portugal is obliged to set up and maintain mandatory reserves of products deriving from crude oil, with the aim of ensuring supply to the domestic market in situations where supply has been disrupted, under the terms of international commitments assumed by the country, specifically within the European Union (EU) and the International Energy Agency (IEA).

113. All the bodies which introduce oil-based products into the domestic market[27] are obliged to maintain minimum quantities of reserves per product, corresponding to 90 days of the quantities introduced into the market in the

[27] It is understood that introduction in the domestic market occurs at the point when the special tax on fuel (ISP) is due – Article 2 of Decree law no. 10/2001.

previous year in the case of crude and refined products in the form of gasoline and diesel.

114. Decree law no. 10/2001, of 23 January sets out the provisions relating to the setting up and maintaining of mandatory reserves of products deriving from crude, thus transposing EU Directive no. 98/93/CE, of 14 December.

115. Decree law no. 339-D/2001, of 28 December, introduced amendments into Decree law no. 10/2001, of 23 January to set up and regulate the body that manages the strategic reserves (*Entidade Gestora de Reservas Estratégicas de Produtos Petrolíferos E.P.E.* - EGREP), and approved its statutes, which were later changed through Decree law no. 242/2008, of 18 December.

116. The creation of EGREP was part of a mixed solution chosen for setting aside the mandatory reserves – a split between a public body and the market operators. The decision made it possible to satisfy different interests: (i) the State gave autonomy to the management of part of the reserves, increasing control over it and consequently its strategic value and (ii) the companies from then on had fewer costs to bear with the smaller quantities involved.

117. The purpose of EGREP is to set up and maintain strategic reserves of oil-based products, corresponding at least to a minimum of a third of the quantities mentioned in point 113 above, replacing the other responsible bodies.

118. The bodies responsible for the setting up of reserves are obliged to pay EGREP of the installments corresponding to that part of the setting up of the reserves that is incumbent on this body, substituting the operators to this end.

119. Decree law no. 71/2004, of 25 March, covers the possibility of setting up reserves in other community countries, and this is likely to be seen as an additional option.

120. The setting up of reserves in another member state of the European Union is subject to prior authorisation and presupposes the existence of intergovernmental agreements, and the details of these would have to be communicated to the European Commission.

121. The siting of these reserves, as per the previous number, is subject to authorisation of the minister for the economy, with recognition of its national interest, the need to satisfy obligations towards international institutions and

the convenience of creating supplies in the market for storage capacity so that competition can be safeguarded.

122. Decree law no. 31/2006 defines an array of principles relating to the security of supplies, with the regulations covering some of these principles left to supplementary legislation.

123. Particular attention should be given to clause 1 of article 32 of the said Decree law, no. 31/2006, according to which the government should take in hand the creation of logistics operation centres at strategic sites on Portuguese territory. These centres should bring together large storage facilities and the means for transport by pipeline, so as to create an integrated system to supply the country with products deriving from crude.

124. Clause 2 in the same article sets down that EGREP can have a holding in the enterprise or enterprises that own the centres mentioned, together with other operators and with any other bodies even if they have nothing to do with the (National Petroleum and Petroleum Products System or *Sistema Petrolífero Nacional*, SPN).

125. Clause 3 in the same article states that the operation of these centres must guarantee access to third parties, in a way that is non-discriminatory and transparent, to be defined in supplementary legislation (not published to date).

3.4.2. Product quality safety – Technical specifications

126. The government has been setting out regulations controlling pollutant emissions, above all sulphur dioxide, of which liquid fuels refined from crude are one of the main sources. This is part of its environment protection policy, the aim being to improve the quality of life.

127. Also in terms of the European Commission, this concern has led to close monitoring, with community policy in this sphere set out in many Directives from the Council that have been transposed into Portuguese legislation.

128. In line with this, Decree law no. 281/2000, of 10 November, amended by Decree law no. 69/2008, of 14 April, transposed into domestic legislation Directive no. 2005/33/CE, of 6 July, and defined the amount of sulphur of certain types of liquid fuel refined from crude.

129. In its turn, Decree law no. 89/2008, of 30 May, sets out the norms relating to the technical specifications for propane, LPG auto, types of gasoline, crude and diesel for road use, diesel coloured and marked, diesel for heating and fuel oil, defining the rules for the quality control of fuel for road use and the conditions for sale of mixtures of biofuel with gasoline and diesel in percentages of more than 5%.

130. It is incumbent on the regional directorates of the Ministry of the Economy and Innovation to put in place the quality control system for liquid fuels for road use.

3.4.3. Affixing and publicising prices for the consumer

131. Affixing and publicising retail prices for fuel for road use are subject to special regulations, with the aim of increasing and improving the transparency of retail prices, making it possible for consumers to choose their service station depending on the price and thus fostering a situation where there would be competition through price.[28]

132. Further to this, Decree law no. 170/2005, of 10 October, provided for mandatory indication of the retail price of fuel in service stations and defined the rules applicable to service stations depending on whether they were on or off the motorways.

133. Rules relating to the content of the placards are defined as well as the general rule regarding mandatory indication of prices on the placards, to be visible to the user before entering the service station.

134. As far as service stations off the motorways are concerned, the placards should contain information on prices relating to all the fuel sold in the service station.

135. As for service stations on the motorways, the legislation stipulates that there should be with an indication on the placards of prices charged in the three following service stations, including the fuel most frequently sold.

[28] In economic literature, it is considered that increased transparency of retail prices (for example by circulating prices in the public domain) is an important factor for fostering competition since it makes it easier for the consumer to compare prices offered by retailers. In general, it is considered that this positive effect more than offsets possible negative effects stemming from the fact that it might also make it easier for retailers to compare prices charged by their competitors – see Massimo Motta (2004), *Competition Policy: Theory and Practice*. Cambridge University Press, p. 156.

136. Decree law no. 120/2008, of 10 July, amended Decree law no. 170/95, of 10 October, in terms of the identification of the bodies responsible for placing the placards, along with conservation and maintenance, stipulating 120 days after publication as the deadline for placing them.[29]

137. As at the date when this Report was published, these placards have not yet been placed. However, there has been news in the press that according to The National Association of Oil Companies (APETRO), they will all be up and working by the end of April this year.[30]

138. The aim of Decree law no. 243/2008, of 18 December was also to make information on retail prices for fuel more accessible, and it lays down the mandatory provision that the characteristics of the service stations, public and cooperative consumption, and of the fuel available for vehicles for road use, must be provided for publication on the web page of the General Directorate for Energy and Geology (DGEG).

3.5. The fiscal framework

3.5.1. The special tax on oil-based products - ISP

139. Oil-based products are subject to a special tax on consumption (*Imposto Especial de Consumo* or IEC), under the provisions of the special tax code (the *Código dos Impostos Especiais de Consumo* or CIEC),[31] in the latest wording in Law no. 64-A/2008, of 31 December, being subject to tax from the point of its production or import into Portugal.

140. The tax is due at the moment it is introduced for consumption.

141. The moment it is "introduced for consumption" is considered to be, for products subject to tax at the point: (i) when such products are no longer covered by temporary exemption, (ii) of manufacture of products not covered by temporary exemption, (iii) when these products are imported if they are not temporarily exempt. In other words, the ISP is due ex-refinery,

[29] The diploma was published on 10 July 2008.

[30] It should be noted that these placards were made mandatory in October 2005, though in 2008 there were certain aspects needing clarification in terms of identification of the bodies responsible for placing them. The deadline then set down was 10 November 2008, and this is now long past.

[31] See Decree law no. 566/99, of 22 December. In the case of fuel consumption, the IEC is known as *Imposto sobre Produtos Petrolíferos* or ISP, i.e., Petroleum Products Tax.

on exit from import depots and from certain CLC storage depots. These, from the fiscal point of view, are considered to be "bonded warehouses" (see paragraph 973 below).

142. Under the terms of applicable community legislation[32] products subject to tax are allowed to circulate in the Community, temporarily exempt, until they are introduced for consumption.

143. As previously mentioned, the ISP is due when the products come onto the commercial circuit for consumption in the domestic market, in other words at the stage of bulk sales, whether they are of domestic production, or imported from another countries or dispatched from another EU member state.

144. The products are temporarily exempt from tax, as per the terms detailed below, until they enter the commercial circuit for consumption in the domestic market.

145. The authorised depositor, the registered operator, the unregistered operator and the legal representative are subject to tax.

146. The production, transformation and storage of products subject to tax, temporarily exempt, can only be carried out in bonded warehouses, by authorisation from and under the control of the competent customs authority.

147. Bonded warehouses can be for storage (in the case of the mandatory reserves and for imports) and production.

148. Bonded warehouses for storage are only authorised when the depositor takes responsibility as a guarantor of the obligations to declare the goods and cover any tax or other fiscal responsibilities even if this person is not the owner of the products.

149. The bodies that have title to the bonded warehouses have the legal status of authorised holders.

150. Authorised holders are subject to a number of obligations, among them:

- To provide pledges under terms fixed by the customs authorities;
- To submit the depots and measuring tools to measurement control;

[32] Directive 2008/118/CE of the Council, of 16 December 2008, relating to the general regime for special taxes on consumption, revoking Directive 92/12 /CEE, of 25 February.

- To keep up-to-date accounting ledgers of the stocks in the system on the basis of permanent inventories;
- To inform the customs authorities of any change in manager or director.

151. The autorisation for bonded warehouses can only be given to an individual or an enterprise satisfying the following requirements cumulatively: (i) having own funds equal to or more than €498,797.90; (ii) storage capacity of at least 100,000 litres per product, and (iii) annual sales equal to or more than €4,987,978.97.

152. The storage of finished products subject to tax, on a temporarily suspended basis, cannot be in bonded warehouses for production.

153. In the bonded warehouses, products subject to tax can be kept on a temporarily suspended basis, whether they come from other countries[33], or from other bonded warehouses.[34]

154. Under the terms of the CIEC, various situations give rise to tax exemption or reductions in rates, with a substantial part of them comprising diesel coloured and marked.

155. This product has a mark as ordered by the tax authorities to prevent fraud.

156. Article 86 of Law no. 64-A/2008, of 31 December, defined the maximum and minimum limits for the tax rates per product for the current year, and the figures for these unit rates of tax should be fixed by Executive order of the Ministers for Finance and for the Economy and Innovation.

157. The government, however, decided not to change the rates for ISP in 2009 and they are therefore those that were in force as per Executive order no. 16-C/2008, of 9 January, that is:

- Gasoline: €582.95 per 1000 litres;
- Diesel: €364.41 per 1000 litres.

3.5.2. Value added tax – VAT

158. Liquid fuels are subject to VAT at the standard rate, that is 20%, and the tax is paid in the normal way.

[33] Products imported (products entering the European Community).

[34] On Portuguese territory or in any other member state.

159. VAT is levied on all transactions along the value chain, with those deductions that are applicable to the economic agents involved, and therefore at the stages of sales (in bulk or retail), the agents pay VAT on their margins.

3.6. Conclusions

160. As detailed previously, the regulatory framework of the oil sector is vast and complex, and this goes for the whole of the value chain in the sector.

161. There follows a description of those norms and/or provisions that are, from the competition standpoint, the most important to ensure better competitive conditions in the liquid fuel sector.

3.6.1. Decree law no. 31/2006, of 15 February

162. In the first place, emphasis must be put on the need to provide the regulations for Decree law no. 31/2006, of 15 February, especially the norms that relate to the possibility of access by third parties to available capacity in large storage facilities, transport and distribution by pipeline, considered to be of public interest, in a non-discriminatory and transparent way.

163. In the same way, there need to be regulations governing the use by third parties of the so-called *Centros de Operação Logística* (Large storage facilities liked by pipelines to port terminals or oil refineries) set out in article 3 of the said Decree Law.

164. The rules relating to access to the various operations of the SPN, where the licencing of the facilities is concerned, should be regulated on the basis of proportionality, with objective criteria, easily checked by interested parties.

165. It is important, also, to clarify some of the provisions of the aforementioned diploma, which as they stand raise doubts about their scope (for example whether the duties of public service will be offset against anything on a *quid pro quo* basis, where arbitration can be invoked in specific conflicts as set down in article 38 this may be in conflict with the application of competition legislation in certain situations detailed in the article).

3.6.2. Mandatory reserves

166. The fact that mandatory reserves have to be set aside is one of the points with a big impact on the competitive capacity of the operators, both through the costs involved and through the need to have storage available for this purpose.

167. The possibility that EGREP could make up for the shortfall in storage capacity of the agents is an interesting alternative, but there are conditioning factors, given the administrative demands involved (ministerial authorisation for publication of the diploma, limiting the period to one year renewable). This cannot therefore be seen as a standard option for independent operators since they would need, among other things, their own storage capacity.

168. In the same way, the legislative possibility of setting up reserves in other member states is an interesting response from the competition point of view, in terms of storage capacity. It is considered that intergovernmental agreements should be speeded up (for instance with Spain), so that this could be become a reality.

3.6.3. Access to the retail market – setting up service stations

169. This area is the one where legislation has been streamlined, but where there are still constrictions, resulting among other things in substantially long periods for autorisations to set up and run new service stations.

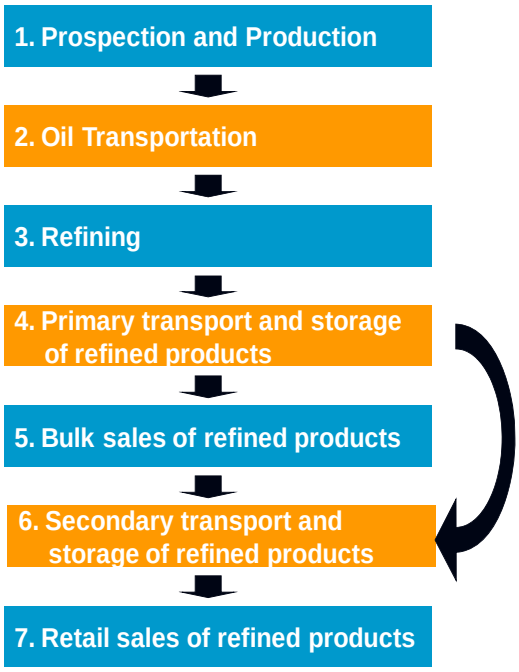
170. In terms of facilities on the motorways, two factors limit competition in the processes by which concessions are awarded, and they should be rethought and possibly altered by the concessionaires:

- The award of concessions to the same company for consecutive service stations, although it is recognised that there may be reductions in costs and as a result there could be benefits to the consumer;
- The very long duration of the concessions, which limits competition in the market after a first concession.

4.The value chain in the sector of liquid fuels for road use

4.1. Stages in the value chain

171. The operations of the oil sector are generally subdivided into operations upstream, and these are prospecting, development, production, transport (by sea) and the sale of crude oil, and the operations downstream, refining, transport and primary storage, bulk sales of fuel, transport and secondary storage and retail sales of fuel in the service stations.



172. Looked at in a simple way, it is possible to distinguish seven different stages in the value chain for crude: prospecting and producing; transport; refining and transforming into refined products; transport and large capacity storage for refined products; bulk sales of refined products; transport of refined products form storage to the point of sale; and retail sales of refined products.

173. Four stages in the value chain of refined products can be picked out for their importance: production, refining, bulk sales of refined products and retail sales of refined products.

Prospecting and production

174. Prospecting and production of crude – the initial stage of the chain – consist of the discovery and extraction of reserves of crude.

175. Accumulations of crude occur predominantly in sedimentary geological formations. The existence of these accumulations is inferred by means of indirect methods and then confirmed, or not as the case may be, by means of test drilling.

176. Once the economic viability of the deposit is established, a production development project is started, and this requires additional investment in drilling and the building of industrial facilities.

177. The process requires on average five years of work at sea from discovery to production, and from one to two years on land.

178. No crude is produced in Portugal. The domestic sector imports all the main raw material (crude) and therefore the operations of oil companies only start farther downstream, with the refining, storage, transport of refined products, bulk sales of refined products, distribution and sales to the public in service stations.

Refining

179. Crude oil is a complex mixture of hydrocarbons and other composites, and cannot be used in its natural form. It needs to be processed at industrial plants (refineries), for the production of refined products (gasoline, diesel, LPG, petrochemical naphtha, solvents, kerosene, oils, lubricants, paraffin, fuel oil and asphalt, among others).

180. Portugal's two refineries are located in Sines and in Leça da Palmeira, and take crude in seaport terminals, where it is discharged from oil tankers.

181. Refining consists of a series of physical and chemical treatments in the refineries, where crude oil is broken down into a range of components, the so-called refined products.

182. The first step in the process consists of fractioned distillation. Using this technique, the crude is heated to boiling point in what is called the fractioning or fractionation column. Here:

- The components with a low boiling point rise continuously up the column until they condense; and
- The components with a high boiling point condense at different points in the column and then flow back down.

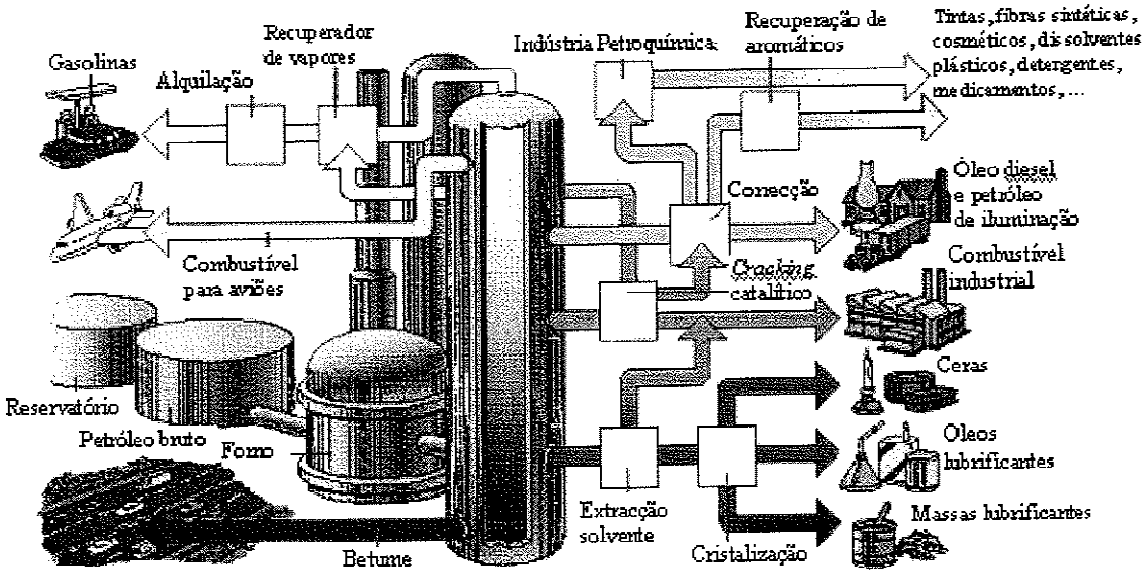
183. In this way it is possible to keep the same temperature at every height of the column and ensure that the condensed liquid always has the same specific chemical composition. These products with specific chemical composition are called fractions and are mainly made up of methane gas, gasoline, crude and diesel.

184. At the base of thisfractioning column, where the temperature is higher, there is a residue which contains volatile fractions. These can be distilled after the residue has been transferred to another column, where boiling continues at a lower and non-destructive temperature and the fractions vaporise. This additional distillation decomposes the residue into fuel oil, lubricating oil, asphalt and paraffin wax.

185. Further processes are possible with a view to obtaining a bigger number and a wider variety of products. The processes can be varied to meet the market demand for different products. The fractions then obtained can be mixed to get products with the properties required.

186. The refining process is illustrated schematically below:

Illustration 1 – illustration of the refining process (in Portuguese)



Source: Galp Energia.

187. The fact that specifications for refined products differ between countries and the needs to cut the risks to local supply and demand have become a justification for siting refineries near centres of consumption. In this way there is optimised capacity of the refinery to respond more quickly to changes in product specifications and in demand and therefore avoid ruptures.

188. Over recent decades, therefore, having a large number of refining facilities on the same site has become the exception rather than the rule.

189. Some of these centres may have lost the importance they had as hubs for refining for export, but they continue to be a reference for defining ex-refinery prices for sale at the points closest to their area of influence.

190. In Europe, the refining centres of the regions of Amsterdam (the Netherlands), Rotterdam (the Netherlands) and Antwerp (Belgium) (commonly known as ARA) are a reference for defining ex-refinery prices for products refined from crude in North Western Europe (commonly known as NWE). They are also the reference prices used by operators in refining and bulk sales in Portugal.

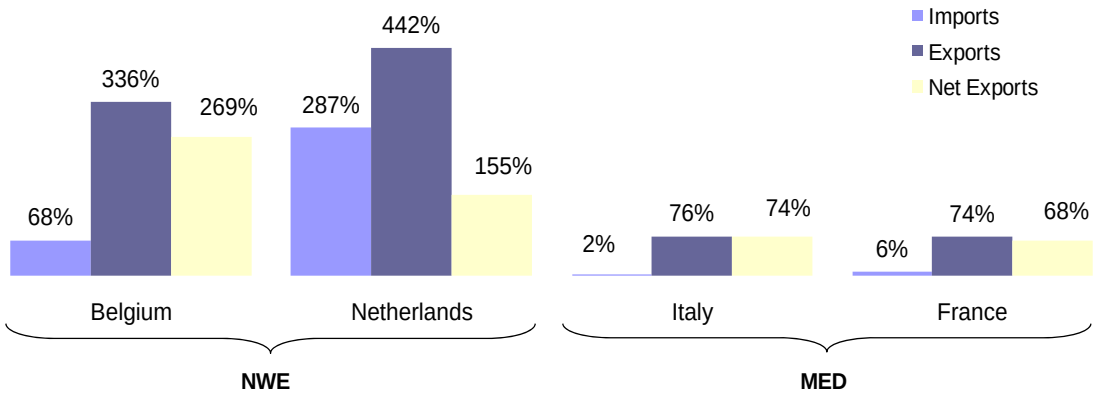
191. The centres of refining in the regions of Lavera (France) and Genova (Italy) are a reference for defining ex-refinery prices of products refined from crude in the Mediterranean basin (an area commonly known as MED).

192. The relevance of these centres of refining as export centres is illustrated by the relative importance of these exports, net of imports, compared with the consumption of the country.

193. In 2007, the refineries situated in Belgium, the Netherlands, Italy and France exported, in net terms (that is, subtracting their imports), a quantity of gasoline[35] equivalent to 269%, 155%, 74% and 68% respectively of the amount consumed in the country. In the cases of Belgium and the Netherlands there were even imports of gasoline destined for export later.

[35] This includes gasoline for road use; gasoline for aviation and jet fuel (JP), because the data from the IEA does not allow for international comparisons with reference only to 95-octane gasoline.

Chart 1 – Relative proportion of imports and exports of gasoline[36] compared with domestic consumption in the two main exporting centres in Europe in 2007



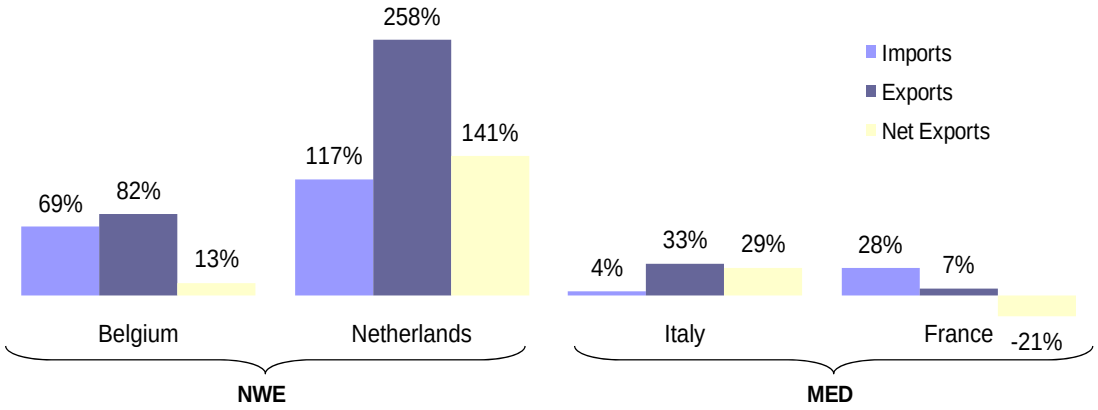
Source: PCA analysis based on IEA data.
1) Includes gasoline for road use, aviation and JP.

194. In terms of diesel, there is in fact a structural shortfall in the countries of the European Union (see the effect of such a situation in the traditional export centre of Lavera in France), but in 2007, the refineries in Belgium, the Netherlands, and Italy exported, in net terms (that is, with the value of imports deducted), a quantity of diesel[37] equivalent to 13%, 141%, 29% respectively of what was consumed in the country. In the cases of Belgium and the Netherlands, there were even imports of diesel for later export.

[36] This includes gasoline for road use; for aviation fuel and jet fuel (JP).

[37] This includes diesel for road use, diesel for heating, diesel for agriculture, diesel for bunkers and diesel for petrochemical production petroquímica, because the data from the IEA does not allow for international comparisons with reference only to diesel for road use.

Chart 2 – Relative proportion of imports and exports of diesel[38] compared with domestic consumption in the two main exporting centres in Europe in 2007



Source: PCA analysis based on IEA data.
1) Includes diesel for all uses (road, heating, agriculture, petrochemical, other).

195. Refined products can be sold directly at the refinery to third parties in cargo (sales ex-refinery). The sale of fuel ex-refinery is at a price often known as the "ex-works refinery price" and is net of tax (ISP).

196. Ex-refinery sales constitute a first level of distribution and consist in the sale of big quantities of refined products in bulk, to wholesalers, retailers and to large-scale traders.

197. To the extent that there are no obstacles to imports of refined products, ex-refinery sales cannot be dissociated from the import circuits of fuel overland (by road or rail) or by sea (in tankers), from refineries outside Portugal.

198. Like other European countries, Portugal exports gasoline and imports products at intermediate distillation, especially diesel.[39]

Bulk sales of gasoline and diesel

199. Apart from the ex-refinery sales mentioned above, some of the large-scale operators acquiring big quantities of refined products at this stage resell part of their purchases in bulk to other operators, to retailers and to major industrial clients.

200. For the sake of simplicity, these sales will be termed bulk sales.[40]

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38 *Idem*.

39 As a reference, Portugal exported one million m^3 of gasoline for road use in 2008, corresponding to 35% of domestic production, and it imported one million m^3 of diesel for road use, corresponding to 19% of total domestic consumption. See the analysis in subsection 6.2.2.

201. Bulk sales constitute a second level of distribution, since they normally involve substantially lower quantities than ex-refinery sales (equivalent to one tanker truck). The clients are: oil companies, independent retailers (without storage capacity), larger retailers, whose aims are either to maximise their distribution network or adjust their stocks after making ex-refinery purchases) and major final customers (industrial and commercial users such as hospitals, car or truck rental companies, hauliers, factories and so on).

202. Normally, the bulk price comprises the ex-refinery price, the cost of storage, filling and transport and other costs incurred after the ex-refinery part of the chain.

203. Not all refined products go through the bulk sale stage. In the case of vertically integrated companies with their own storage capacity, a large part of the refined products acquired ex-refinery are for sale in the retail market and therefore are not transacted at this stage.

Retail sales of gasoline and diesel

204. The term "retail sales of gasoline and diesel" means the sales in service stations to final consumers.

205. In retail sales of gasoline and of diesel for road use there are, generally speaking, three categories of service stations:

- service stations selling the brand of the oil companies that are traditionally integrated vertically;
- independent service stations;
- supermarkets.

206. The companies vertically integrated (those which operate from prospecting for crude and/or refining to sales to the public) are commonly known as "oil companies".

207. Service stations selling the brand of the oil companies that are traditionally integrated vertically fall into one of at least three categories, as a function of their vertical contract relations. These are:[41]

[40] Note that sales to major industrial clients, strictly speaking, relate to sales for final consumption by these clients. Even so, for the sake of simplicity, the term "bulk sales" will be used.

[41] These categories are the most representative but there are more, and the structure could be further broken down into subcategories.

- Service stations of the COCO type ("*Company Owned Company Operated*"), that is, service stations which are owned and run by the oil company or one of its subsidiaries.
- Service stations of the CODO type ("*Company Owned Dealer Operated*"), that is, service stations which are owned by the oil company (or one of its subsidiaries) but are run by a third party (dealer/agent).
- Service stations of the DODO type ("*Dealer Owned Dealer Operated*"), that is, service stations which are owned and run by a third party.

208. Independent service stations are those that sell fuel for road use under brands that are different from the "oil companies".

209. Service stations selling the brand of large retail distribution chains (known henceforth as "supermarkets"[42]) belong to these chains and are normally located near their own sites. Their commercial strategies and other characteristics differ from the other independent retailers.

210. It is also important to differentiate between service stations on the motorways and those off the motorway.

211. One of the reasons for this is that the demand for fuel on the motorway seems to be a response to other parameters than off it. Drivers use a motorway to benefit from fast traffic flow and from integrated services running from the supply of fuel to restaurants, places for resting and so on. One consequence of this is a smaller sensitivity to the price of fuel. The fact that they pay a toll reinforces their reticence to go off the motorway to find a service station with lower prices.[43]

212. Moreover, the service stations on the motorways are subject to concessions and in Portugal the operators are exclusively oil companies which are in the refining business, are vertically integrated and sell their fuel under their own brand names. They control the commercial policy for the sale of fuel in their service stations on the motorways. The management of these service

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[42] For the sake of simplicity, the expression "supermarkets" will be used to refer to large retail chains such as the brands Jumbo, Continente, Feira Nova, Pingo Doce, Intermarché and Leclerc, and can include supermarkets, hypermarkets and even cash and carry operators (such as Makro and Recheio).

[43] For example, "Report on the competitive conditions of non-integrated independent companies in the motor fuel sector", Case 37.987, September 2001, DG COMP/UE, paragraphs 27 and 240. See also the decision of the European Commission in the case COMP/M.5005 of 31.10,2008 – Galp Energia vs Exxon Móbil – paragraph 13 and the decision of the European Commission in the case COMP/M.1628 – TotalFina/Elf of 09.02.2000, paragraph 23.

stations is different from the management of service stations off the motorways. More details on this are given later in this Report.

4.2. The relative importance of each stage in the value chain in Portugal

213. Having looked at the different stages of the value chain (section 4.1) it is important to understand the relative proportion of each of these stages in the average pump price of the fuel (the average prices for sales to the public).

214. The transport of crude (included in the price of crude) and bulk sales of refined products (included in the retail margin) are of smaller relative importance and more difficult to estimate so they have not been detailed in this analysis.

215. It should be recalled that the most representative stages of the value chain are prospecting, extracting, refining, transport, primary storage of refined products and retail operations.

216. In order to understand the relative proportion of each of these components, the PCA collected a vast amount of information and cross-checked various sources. Among these are the four oil companies operating in Portugal (Galp, BP, Cepsa and Repsol), data from the European Commission, reports published by Galp and data supplied by the information agency Platts.[44]

217. For 95-octane gasoline and for diesel for road use, the two main elements that contribute to the average retail price are tax (ISP and IVA) and the price of crude 45 – see Tables 1 to 4 and Charts 3 to 8.

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[44] The average pump price and pre-tax prices used in the analysis relating to liquid fuels for road use (Part A of the Report) refer to diesel (for road use) and to 95-octane gasoline (euro super 95), as classified by the EC's General Directorate for Energy and Transport (DG TREN), available on: http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm. To determine the prices of transport and primary storage for refined products, information provided by Galp, Repsol, Cepsa and BP was used; to determine the average weighted domestic ex-refinery price, information was provided by Galp, Repsol, Cepsa and BP; information provided by Galp, Repsol, Cepsa and BP was used for refining margins, with information in the public domain provided by Galp; the specific margins per product were estimated on the basis of the *crack spreads* put together from Platts; and data from the ECB was used to determine the rates of exchange.

[45] Retail sales of gasoline in mainland Portugal accounted for more than 2.4 thousand million euros in 2008. Of this figure, 1.4 thousand million euros related to tax. In the 1.1 thousand million euros' difference, the cost of crude and raw materials accounted for 714 million euros, refining for 35 million euros (of which almost 55%, that is, around 19 million euros, corresponded to the net refining margin), storage and secondary transport for 34 million euros, and retail operations for 184 million euros.

Table 1 – Quarterly moves in the value of each stage leading to the average retail price of 95-octane gasoline (in euro/Litre).

	1Q2007	2Q2007	3Q2007	4Q2007	1Q2008	2Q2008	3Q2008	4Q2008	Averg 2007	Averg 2008
Price of crude & RM	0.259	0.317	0.360	0.379	0.412	0.482	0.493	0.294	0.329	0.420
Refining operations	0.065	0.100	0.046	0.034	0.022	0.020	0.028	0.013	0.061	0.021
Storage + Transp.	0.019	0.019	0.019	0.019	0.020	0.019	0.020	0.020	0.019	0.020
Retail operations	0.096	0.095	0.103	0.101	0.106	0.098	0.104	0.120	0.099	0.108
PRE-TAX PRICES	**0.438**	**0.530**	**0.528**	**0.533**	**0.560**	**0.619**	**0.645**	**0.447**	**0.507**	**0.569**
ISP	0.581	0.583	0.583	0.583	0.583	0.583	0.583	0.583	0.582	0.583
VAT	0.214	0.234	0.233	0.234	0.240	0.252	0.246	0.206	0.229	0.236
THE AVERAGE RETAIL PRICE	**1.233**	**1.347**	**1.344**	**1.351**	**1.382**	**1.455**	**1.473**	**1.236**	**1.319**	**1.388**

Source: Analysis by the Portuguese Competition Authority based on data from Galp, Repsol, Cepsa, BP, Platts, the European Commission and the ECB.

Table 2 – Quarterly moves in the relative proportion of each of the components in the average pump prices and the average pre-tax prices for 95-octane gasoline (as a percentage).

	1Q2007	2Q2007	3Q2007	4Q2007	1Q2008	2Q2008	3Q2008	4Q2008	Averg 2007	Averg 2008
Price of crude & RM	21.0 %	23.5	26.8	28.1	29,8	33.2	33.5	23.8	24.9	30.3
Refining operations	5.3 %	7.4	3.4	2.5	1.6	1.4	1.9	1.1	4.7	1.5
Storage + Transp.	1.5 %	1.4	1.4	1.4	1.4	1.3	1.3	1.6	1.4	1.4
Retail operations	7.8 %	7.1	7.6	7.5	7.7	6.7	7.1	9.7	7.5	7.8
ISP	47.1 %	43.3	43.4	43.2	42.2	40.1	39.6	47.2	44.2	42.0
VAT	17.4 %	17.4	17.4	17.4	17.4	17.4	16.7	16.7	17.4	17.0
THE AVERAGE RETAIL PRICE	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Price of crude & RM	59.0 %	59.7	68.3	71.1	73.6	77.9	76.5	65.8	64.8	73.9
Refining operations	14.8 %	18.9	8.8	6.3	3.9	3.2	4.3	2.9	12.1	3.6
Storage + Transp.	4.3 %	3.5	3.5	3.5	3.6	3.1	3.1	4.4	3.7	3.5
Retail operations	21.8 %	17.9	19.4	19.0	18.9	15.8	16.2	26.8	19.4	19.0
PRE-TAX PRICES	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Analysis by the Portuguese Competition Authority based on data from Galp, Repsol, Cepsa, BP, Platts, the European Commission and the ECB.

Retail sales of diesel for road use accounted for more than 4.7 thousand million euros in 2008. Of this figure, 2.1 thousand million euros related to tax. In the 2.6 thousand million euros' difference, the cost of crude and raw materials accounted for 1.9 thousand million euros, refining 164 million euros (of which 61%, that is, around 100 million euros, corresponded to the net refining margin), storage and secondary transport for 77 million euros, and retail operations for 415 million euros.

Table 3 – Quarterly moves in the value of each stage in the average retail price of diesel for road use (in euros/Litre).

	1Q2007	2Q2007	3Q2007	4Q2007	1Q2008	2Q2008	3Q2008	4Q2008	Averg 2007	Averg 2008
Price of crude & RM	0.297	0.347	0.383	0.435	0.476	0.591	0.579	0.347	0.365	0.504
Refining operations	0.057	0.048	0.038	0.043	0.031	0.038	0.050	0.059	0.047	0.044
Storage + Transp.	0.022	0.021	0.022	0.022	0.023	0.022	0.023	0.022	0.022	0.021
Retail operations	0.094	0.093	0.092	0.096	0.105	0.099	0.109	0.148	0.094	0.112
PRE-TAX PRICES	**0.470**	**0.509**	**0.535**	**0.595**	**0.635**	**0.750**	**0.761**	**0.576**	**0.527**	**0.681**
ISP	0.362	0.364	0.364	0.364	0.364	0.364	0.364	0.364	0.364	0.364
VAT	0.175	0.183	0.189	0.201	0.210	0.234	0.225	0.188	0.187	0.214
THE AVERAGE RETAIL PRICE	**1.007**	**1.057**	**1.089**	**1.161**	**1.209**	**1.349**	**1.351**	**1.129**	**1.078**	**1.260**

Source: Analysis by the Portuguese Competition Authority based on data from Galp, Repsol, Cepsa, BP, Platts, the European Commission and the ECB.

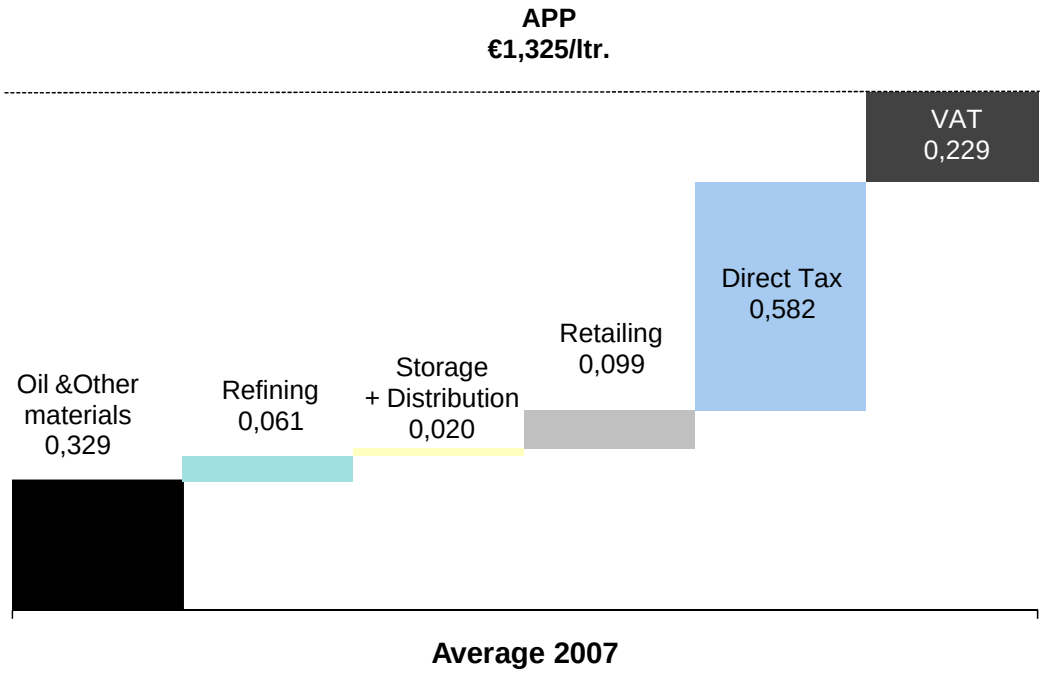
Table 4 – Quarterly moves in the relative proportion of each of the components in the average pre-tax retail prices for diesel for road use.

	1Q2007	2Q2007	3Q2007	4Q2007	1Q2008	2Q2008	3Q2008	4Q2008	Averg 2007	Averg 2008
Price of crude & RM	29.5%	32.8	35.1	37.5	39.4	43.8	42.9	30.8	33.9	40.0
Refining operations	5.7%	4.5	3.5	3.7	2.5	2.8	3.7	5.2	4.3	3.5
Storage + Transp.	2.2%	2.0	2.0	1.9	1.9	1.6	1.7	2.0	2.0	1.7
Retail operations	9.3%	8.8	8.5	8.3	8.7	7.4	8.0	13.1	8.7	8.9
ISP	35.9%	34.5	33.5	31.4	30.1	27.0	27.0	32.3	33.7	28.9
VAT	17.4%	17.4	17.4	17.4	17.4	17.4	16.7	16.7	17.4	17.0
THE AVERAGE RETAIL PRICE	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Price of crude & MP	63.2	68.1	71.5	73.1	75.1	78.8	76.1	60.3	69.3	73.9
Refining operations	12.1	9.4	7.2	7.2	4.8	5.0	6.6	10.2	8.8	6.5
Storage + Transp.	4.7	4.1	4.1	3.6	3.6	2.9	3.0	3.9	4.1	3.1
Retail operations	20.0	18.3	17.3	16.1	16.5	13.3	14.3	25.7	17.8	16.5
PRE-TAX PRICES	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Analysis by the Portuguese Competition Authority based on data from Galp, Repsol, Cepsa, BP, Platts, the European Commission and the ECB.

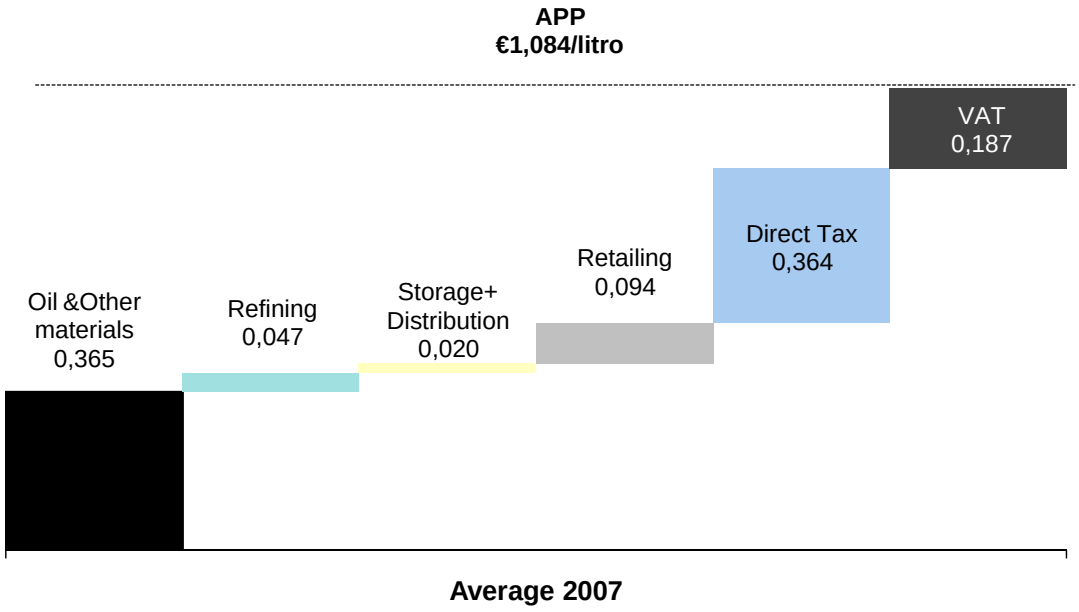
218. This situation is illustrated in the following charts:

Chart 3 –Breakdown of the average retail price of 95-octane gasoline in Portugal in 2007



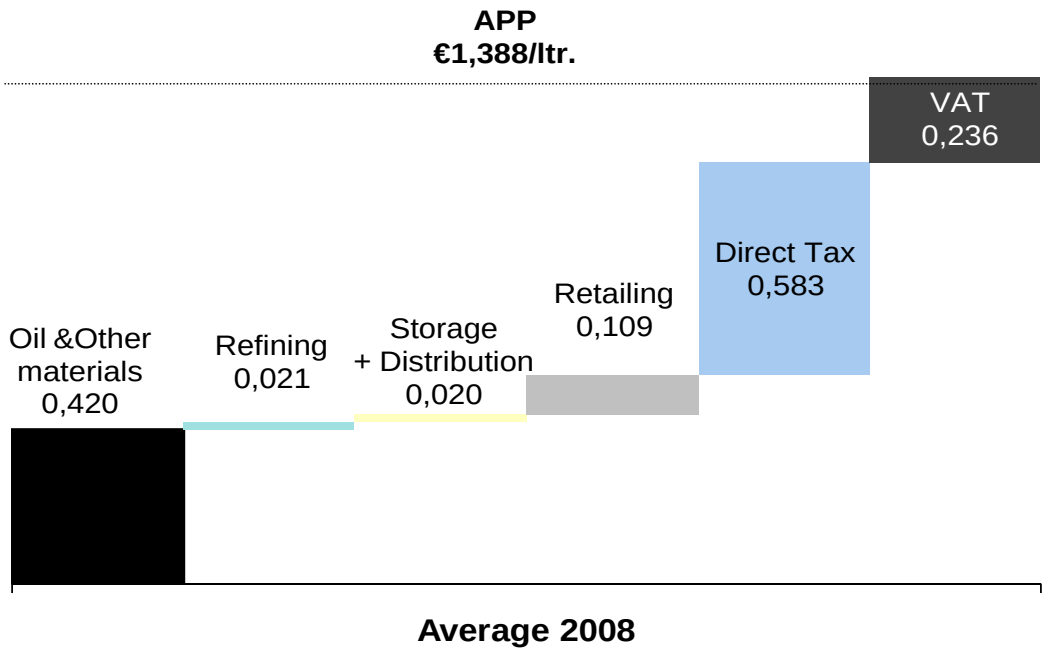
Source: PCA analysis based on Galp; Repsol; Cepsa; BP; Platts; EC and ECB data.

Chart 4 –Breakdown of the average retail price of diesel for road use in Portugal in 2007



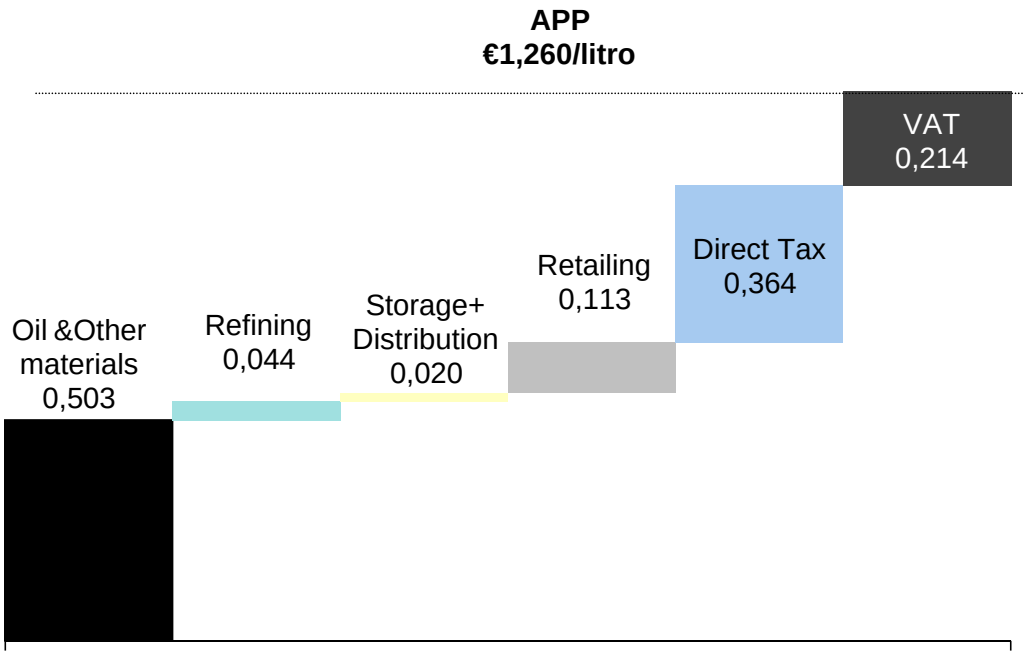
Source: PCA analysis based on Galp; Repsol; Cepsa; BP; Platts; EC and ECB data.

Chart 5 –Breakdown of the average retail price of 95-octane gasoline in Portugal in 2008



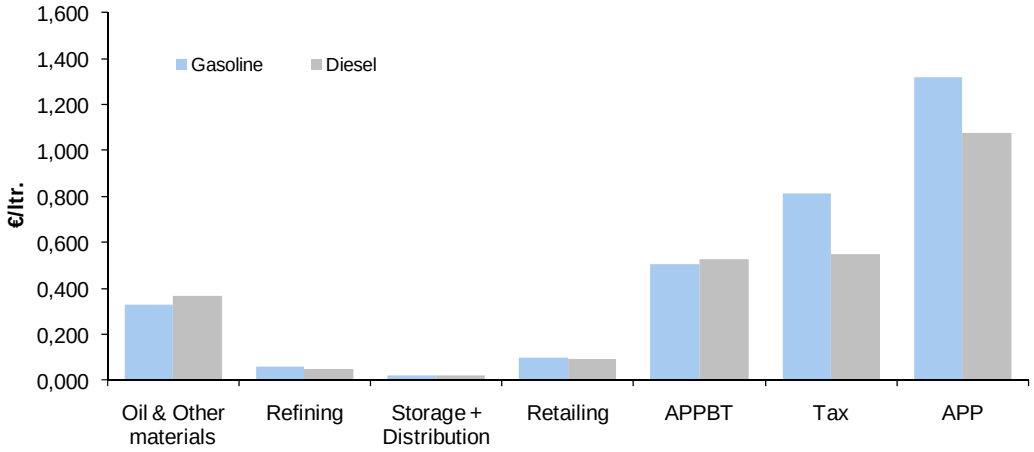
Source: PCA analysis based on Galp; Repsol; Cepsa; BP; Platts; EC and ECB data.

Chart 6 –Breakdown of the average retail price of diesel for road use in Portugal in 2008



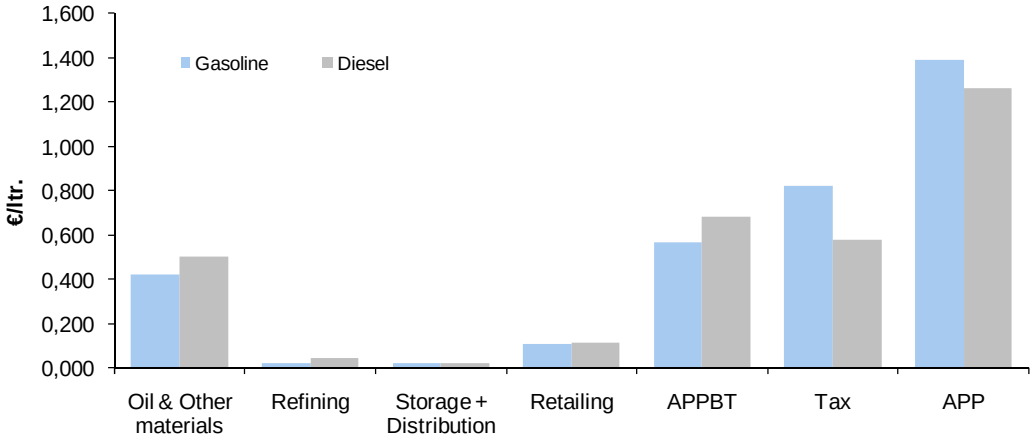
Source: PCA analysis based on Galp; Repsol; Cepsa; BP; Platts; EC and ECB data.

Chart 7 –Breakdown of the average retail price of fuel for road use in Portugal in 2007



Source: Analysis by the Portuguese Competition Authority based on data from Galp, Repsol, Cepsa, BP, Platts, the European Commission and the ECB.

Chart 8 Breakdown of the average retail price of fuel for road use in Portugal in 2008



Source: Analysis by the Portuguese Competition Authority based on data from Galp, Repsol, Cepsa, BP, Platts, the European Commission and the ECB.

219. Charts 7 and 8 illustrate an important fiscal effect of the ISP: the relative price of gasoline and of diesel are inverted before and after tax. Although the price of diesel is higher than that of gasoline before tax, it becomes cheaper after tax. This is because of the difference between the special tax (ISP) on gasoline (58.3 cents/litre) and on diesel (36.4 cents/litre). In 2007, the

relative price of diesel and of gasoline was 1.039 (= 0.527/0.507) before tax and 0.817 (=1.078/1.319) after tax; in 2008, the relative price was 1.197 (= 0.681/0.569) before tax and 0,908 (=1.260/1.388) after tax.

220. The inversion of the relative price in terms of the price after tax, in other words, the pump price, has played a part in the emphasis on diesel ("dieselisation") in the Portuguese economy, a feature that is common to most European economies, and one that we will return to again further on.

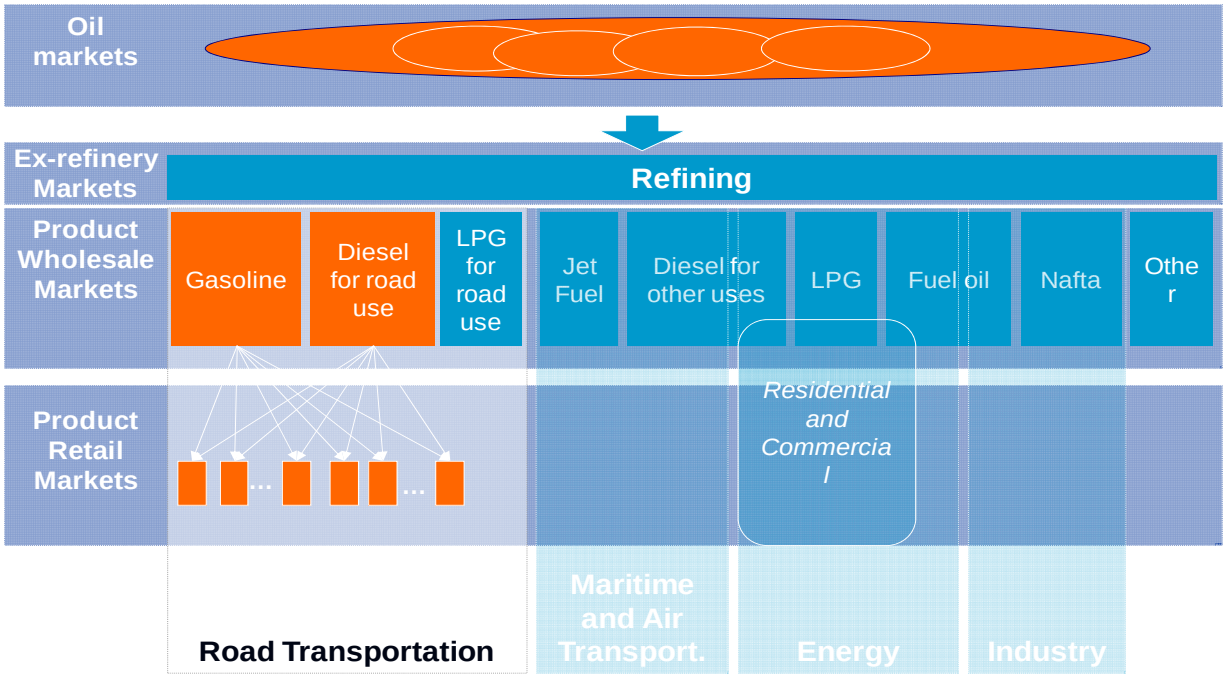
4.3. Each stage in the value chain may include various distinct markets

221. In order to understand how retail prices of fuel for road use are reached in Portugal, it is necessary to understand that there is not just one single "fuel market".

222. The markets for crude are distinct from the retail market of fuel for road use and therefore any moves in prices in the markets do not have to be the same at all times, indeed not even similar to moves in prices in other markets.

223. It is more a question of various markets in the fuel sector which work at different stages of the value chain and have different supply and demand characteristics.

Illustration 2 – The various markets and stages in the fuel sector



224. Apart from this, and in an analysis from the perspective of competition, each of these markets may and indeed does have a different geographical spread: there are markets with global scale and others with a national, regional or local scale.

225. In short, and for the sake of simplicity, it is possible to put these markets into 3 large groups (each large group is not in itself a single market but a range of markets):

- The markets for crude (crude);
- The international ex-refinery markets (ex-refinery), which may include imports and/or exports for each of the products refined from crude;
- The domestic markets, which may be bulk or retail for one of the products refined from crude.

226. There are also other related markets, such as those of transport operations involving crude, the transport of refined products, storage of refined products, and others.

227. These groups of markets are closely interconnected but moves in prices in each of them are not necessarily the same in the short term, and there may

be moments in time when the price goes up in one specific market and down in another.

228. In particular, there are time lags and asymmetries in the adjustments of prices downstream to changes in the prices upstream (this point is analysed in detail in chapter 12.

229. Even so, in the long term, the prices of products in these markets are closely interrelated.

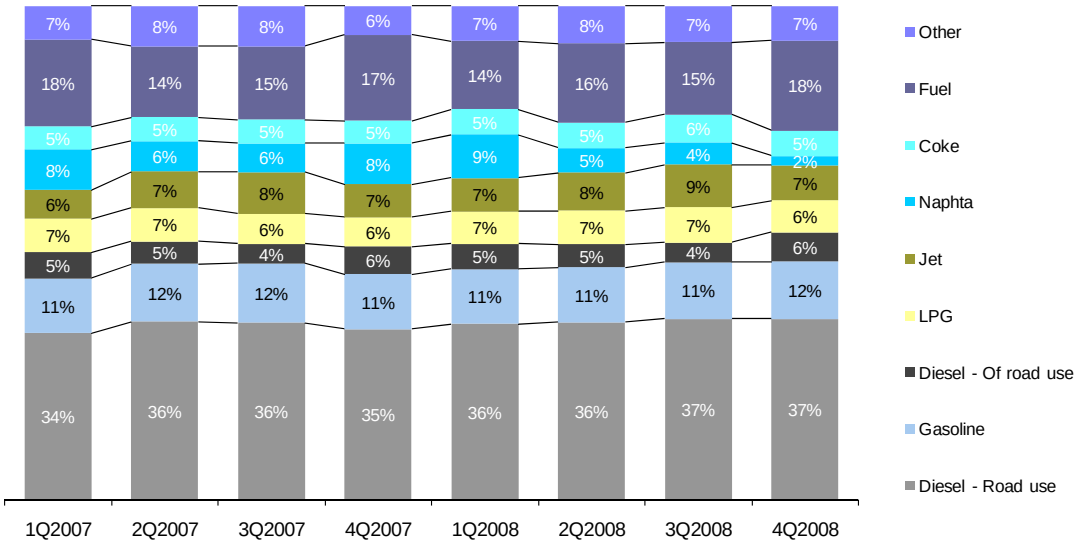
4.4. The relationship between prices of crude, international prices of gasoline and diesel and retail prices of fuel for road use

230. Comparisons are frequently drawn between moves in the prices of crude in the international markets and moves in the retail prices of gasoline and diesel for road use.

231. However, this type of direct comparison often ignores the way retail prices of fuel are reached, since they do not take into consideration the whole value chain of liquid fuels. Very frequently, the agreement also brings in the exchange rate effect, and this requires extra care when comparing the changes in the prices of crude in dollars and retail prices in euros.

232. In Portugal, the consumption of fuel for road use in 2008 (95-octane gasoline, 98-octane gasoline and diesel) accounted for less than half the total consumption of all the products refined from crude (47% in 1Q 2008 and 2Q 2008; and 48% in 3Q 2008 and 4Q 2008).

Chart 9 – Moves in the relative proportion of consumption of products refined from crude per type of product during 2008

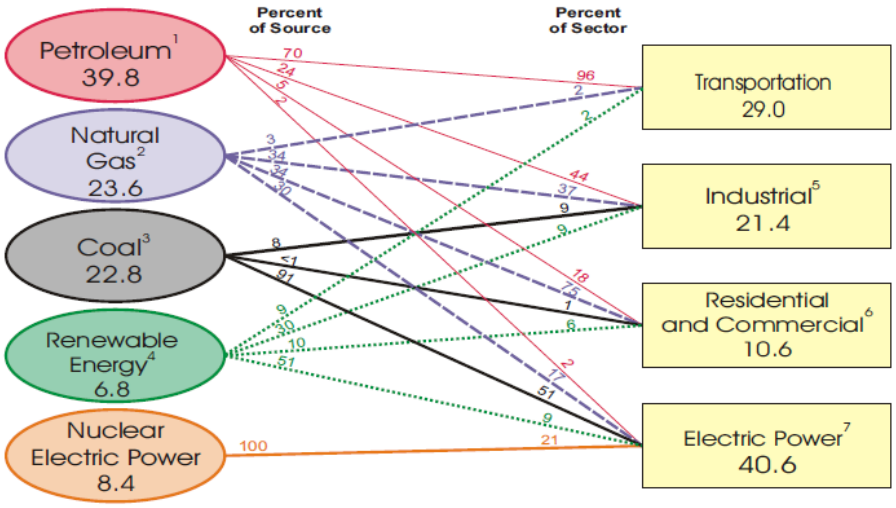


Source: PCA analysis based on DGEG data.

233. In fact, a considerable proportion of the products refined from crude consumed in Portugal are for sea-going or air-borne transport, for the production of energy (either for residential or industrial purposes) and for industry.

234. The panorama of consumption of the products refined from crude in Portugal is not significantly different, for example, from the USA, where during 2007, 31% of the consumption of products refined from crude were for the industrial, residential and commercial and energy production sectors, with the remaining 70% for transport (including transport by road, air and sea).

Chart 10 – Primary consumption of energy in the USA per source and sector in 2007 (figures in thousands of billions (10^{15}) Btu)



Source: Energy Information Administration, Annual Energy Review 2007, and Tables 1.3, 2.1b-2.1f and 10,3.

235. We need to understand the relative importance of the proportion of fuel for road use in aggregate demand for products refined from crude because it means we can see that the demand for crude does not depend exclusively on the demand for 95-octane gasoline and diesel for road use, but on demand for a vast number of other products, with a vast range of uses.

236. The fact is that crude, although it is the main raw material for the production of 95-octane gasoline and diesel for road use, is also raw material for the production of an enormous array of other products, among which there is fuel oil (for the production of energy, bunkers and for industry), LPG (liquefied gas from crude), jet fuel, naphtha, coke, asphalt and many more besides.

237. The price of crude can therefore vary as a result of an increase in demand for other refined products, not just 95-octane gasoline and diesel for road use.

238. For this reason, the prices of crude in the short term can vary in ranges and/or directions that are distinct from the prices of refined products, although in the long term there is a close correlation between them.

4.5. Conclusions

239. The liquid fuel market does not depend solely on the market for crude oil, although it is very influenced by it. The relationship, in fact, is neither linear nor straightforward.

240. Oil company operations are generally subdivided into operations upstream, which are prospecting, extracting, production, transport (by sea), the sale of crude oil, and operations downstream, involving refining, transport and primary storage, bulk sales of fuel, transport and secondary storage and retail sales in service stations.

241. The combined operations upstream and downstream lead to a value chain that it is very important to quantify: (i) the relative proportion of each stage in this value chain, and (ii) the impact that the activities of the various economic agents involved (ranging from operators to consumers and from regulators to competition and tax authorities) can have on this value chain.

242. In order to understand the mechanisms underlying how retail prices of fuel for road use are reached, it is necessary to understand that there is no single “fuel market”. The markets for crude, for instance, are distinct from the retail market of fuel for road use, and therefore moves in the price of one of the markets will not necessarily be the same at all times as moves in prices in the other markets.

243. There is a varied range of markets in the fuel sector and they come in at different stages of the value chain, with different supplies and demands.

244. We need to understand the relative importance of the proportion of fuel for road use in aggregate demand for products refined from crude because it means we can see that the demand for crude does not depend exclusively on the demand for 95-octane gasoline and diesel for road use, but on demand for a vast number of other products, with a vast range of uses.

245. The price of crude can therefore vary as a result of an increase in demand for other refined products, and not just 95-octane gasoline and diesel for road use. For this reason, in the short term, the prices of crude can vary in ranges and/or directions that are distinct from the prices of refined products, although in the long term there is a close correlation between them.

246. For example, the volatility in the pump price for fuel for road use in Portugal in 2007 and 2008 could be explained not only by changes in the price of

crude, but also by changes in the international reference prices of refined products (as can be seen in Chart 7 and Chart 8 - component prices of the raw materials and refining operations) the by the changes in the dollar/euro exchange rate.

247. There is another component in the pump price, and that is tax (ISP and VAT). This is normally less volatile, but with a bigger relative proportion. The importance of this component stems not only from its relative proportion, but also from the distortion that it introduces in the relative price of gasoline and diesel after tax.

248. One result of this was that in 2007 and 2008, pre-tax prices of 95-octane gasoline were lower than diesel, but the pump price of 95-octane gasoline was higher than diesel due to the fact that the special fuel tax on gasoline was significantly higher than for diesel (58.3 cents/litre *vs.* 36.4 cents/litre).

249. Since the price of crude and the reference prices of refined products ex-refinery are set on the basis of international quotations, and the Portuguese tax is set by the tax authorities, these three components are exogenous to the effects of the market in Portugal.

250. Seen from a competition perspective, the points of concern in any country are limited to two components of the value chain: post-refining storage and transport, and retail operations. The relative aggregate proportion of the latter in the value chain, in the case of Portugal, stands between 9% and 11% of the total value, or between 20% and 23% of the value before tax, using data relating to 2008.[46]

[46] Taking the data presented in Table 2 and Table 4, we find that in 2008 the proportion of cost of storage and transport and of cost of retail operations together was 9.2% of the average pump price for 95-octane gasoline and 10.6% of the average pump price of diesel for road use. In terms of pre-tax prices, *i.e.*, the average pump price less the taxes ISP and IVA, and for the same year of 2008, this proportion together was 22.5% in the case of 95-octane gasoline and 19.6% in the case of diesel for road use.

5. Analysis of the markets for the raw material (crude)

5.1. Introduction

251. The markets for crude are global. They have their own supply and demand patterns and these are different from ex-refinery markets, and from bulk sales and retail sales of gasoline and diesel.

252. On the supply side, the price of crude is conditioned by the existence of a cartel of producer countries which sets production quotas. As a result, this leads to a higher price for crude in international markets than there would be if there were a competitive process involved.

253. On the demand side, there are many refineries, though no single one has the purchasing power to be able significantly and independently to influence the international price of crude.

254. Demand for crude from each company with refining operations depends on its capacity for production, its expectations for demand for products refined from crude and the levels of its stocks.

255. Although each single refining company does not seem to have the capacity to influence the market price of crude significantly, this does not mean that all the refining companies pay the same price for their crude at any one time.

256. In fact, the supply of crude to a refinery depends on a number of factors, among them:

- The geographical location of the refinery (that is, the transport costs between the production and the refining facilities);
- The quality of crude purchased in terms of mandatory production specifications;
- Policy issues.

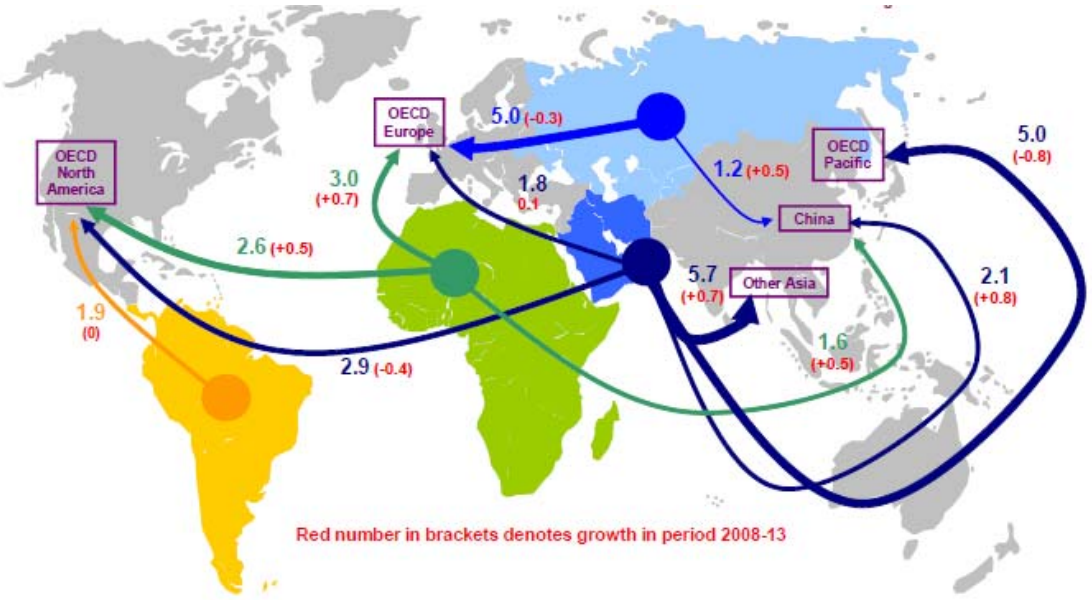
257. In terms of geographical location, crude is generally exported from the producer country to the consumer country and this gives more added value for the producer (commonly known as “netback”). Therefore, all other things being equal, crude is shipped in the first place to the nearest consumer

country (that is, with the lowest transport costs) and only then to the second nearest consumer country, and so on successively.

258. The cost for transport of crude can account for more than 2.3% of its value.[47]

259. As a result, in terms of inter-regional flows, the United States depends for most of its supplies on countries in Africa and South America, the European countries depend on Africa and the former USSR, and the Asian countries on the Middle East.

Illustration 3 – Forecast for exports of crude in 2013 and forecasts of growth between 2008 and 2013 on the main inter-regional commercial routes (in million barrels per day; figures in red between brackets correspond to the rate of anticipated growth of exports per route between 2008 and 2013)



Note: This illustration excludes intra-regional flows.
Source: IEA.

260. In practice, however, the flows of crude do not always follow the rule of supplying the nearest market.

261. The rankings of the suppliers of crude may change because of requirements in a variety of situations: one of these relates to the quality of crude (which

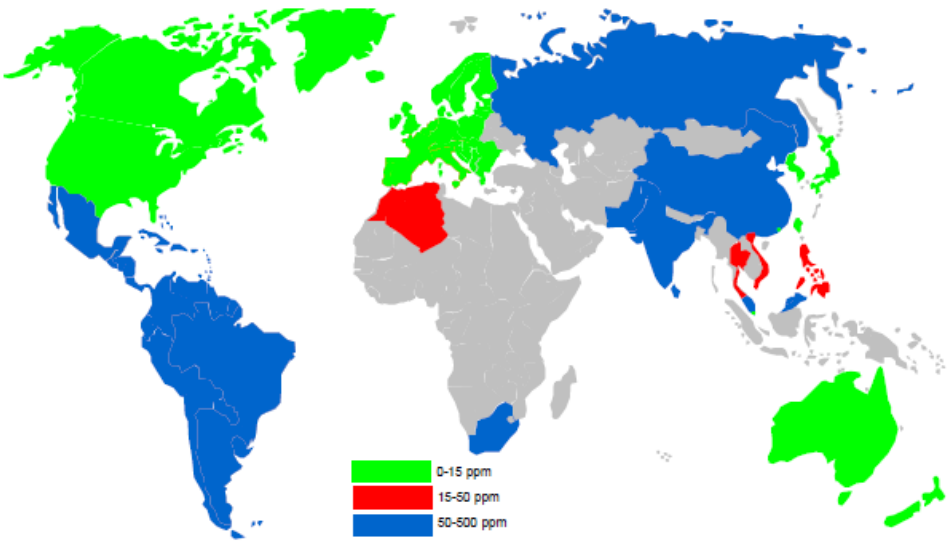
[47] This figure is calculated by a comparison of the price of maritime transport for the North-Sea-USAC (United States Atlantic Coast) route, for ships of 130,000 tons, on a spot basis, with the average price of Brent Dated in 2008, as reported by Platts.

may be determined by the way the process of refining works in the purchasing countries, by the demand mix in the consumer countries, or by product quality specifications). Other points are political relationships between countries and the need to guarantee secure supplies.

262. The technical characteristics of each refinery mean that specific forms of crude may be in more demand from some refineries, either because more can be obtained from them in these refineries, or because there are more possibilities for the production of refined products with greater added value.

263. The differences in product quality specifications mean that the various types of crude have a different value for the refineries. Therefore, as an example, fuel for road use with low amount of sulphur is worth more in the United States and Europe, where the levels of environmental requirements are higher, whereas in Africa and in Asia, heavier and more low-grade crude may be enough to satisfy environmental demands that are 10 to 20 times lower in terms of sulphur levels (ppm).

Illustration 4 – Forecast for the specifications of the amount of sulphur in diesel for 2012 (in ppm)



Source: IEA.

264. These differences in grading quality may be enough to offset the relative importance of transport costs (it can be seen, for example, that Africa, in spite of being farther from Asia than the Middle East still supplies Asian

countries: it exports crude that is heavier, and therefore cheaper, than the crude from the Middle East).

265. Political relationships between countries also have an influence in terms of the prices for purchasing crude and the flows between producer and consumer countries.

266. In specific situations, the import of crude from specific destinations is given priority (for example: crude from Brazil, Angola, Venezuela and Libya to Portugal, crude from Saudi Arabia to the USA, among others). In other situations, there is a disincentive to imports of crude from specific countries (for example the USA embargo on the purchase of crude from Iran and Libya; limitations on sales imposed by Mexico on the USA).

267. In short, the markets of crude can be seen as a large "pool" of various qualities of crude or, in other words, the different markets are interconnected in a large integrated international market.

268. It can thus be seen that there is no single quality of crude but rather a range of crudes with different levels of quality (such as different densities) and different prices.

269. The two specifications of crude used internationally as a reference for the price are commonly known as Brent (Crude) and Western Texas Intermediate (WTI), also known as Light Sweet Crude.

270. This does not mean, however, that all the companies with refining operations buy crude at the Brent price: because there are different qualities of crude, there may be different prices at any one moment in time.

271. What this means is rather that Brent or WTI serve as a reference for indexing these prices for purchase, with spreads (positive and/or negative) which correct the price according to the quality of crude acquired, the location of the purchaser/vendor, and other factors.

272. In Portugal, the price of Brent is normally used as the index.

273. This introduction on the way the markets for crude work is followed by an attempt to summarise recent changes in the quantities and prices for sale used as a reference of crude.

274. In sections 5.2 and 5.3 changes in aggregate demand for crude and the global supply between 2007 and 2008 will be analysed.

275. Section 5.4 contains an analysis of changes in the domestic demand for crude for the same period.

276. Sections 5.6. and 5.7 deal with the prices of crude and with the transport of crude by sea.

5.2. World demand for crude

The structure of demand

277. On the demand side, there are many refineries and economic groups that own refining complexes and compete for the acquisition of crude.

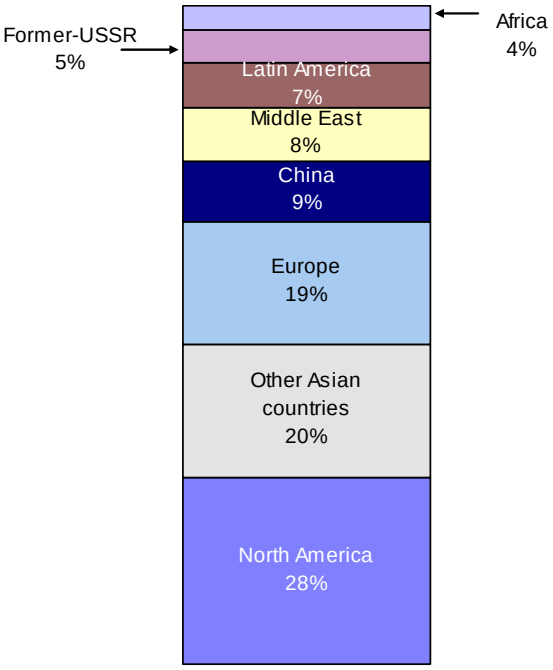
278. Demand is very dispersed, even though there are large economic groups with refining complexes (among these groups are: Exxon Mobil Corp., Royal Dutch Shell plc, BP plc, Sinopec, Valero Energy Corp., Crudes de Venezuela, SA, Total, SA, Conoco Phillips, China National Petroleum Corp, Crude Brasileiro, SA., Crudes Mexicanos, National Iranian Oil Co., and OAO Yukos).

279. As an example of this dispersion, the biggest group in terms of refining (Exxon Mobil Corp.) had only 13.3% of total refining capacity of the 15 biggest refining groups in the world 2008.

280. In terms of geographical areas, the biggest demand for crude in 2008 came from the North America and Asian regions. North America accounted for 28% of consumption while Asia (including the Pacific region) accounted for 29%. This includes China, which by itself accounted for 9% of world demand.

281. Europe came in with 19% of total world demand, the Middle East with 8%, Latin America with 7%, the countries of the former USSR with 5% and Africa with 4%. The picture can be seen in the chart below:

Chart 11 – Relative proportion of the various regions in world demand for crude in 2008



Source: IEA.

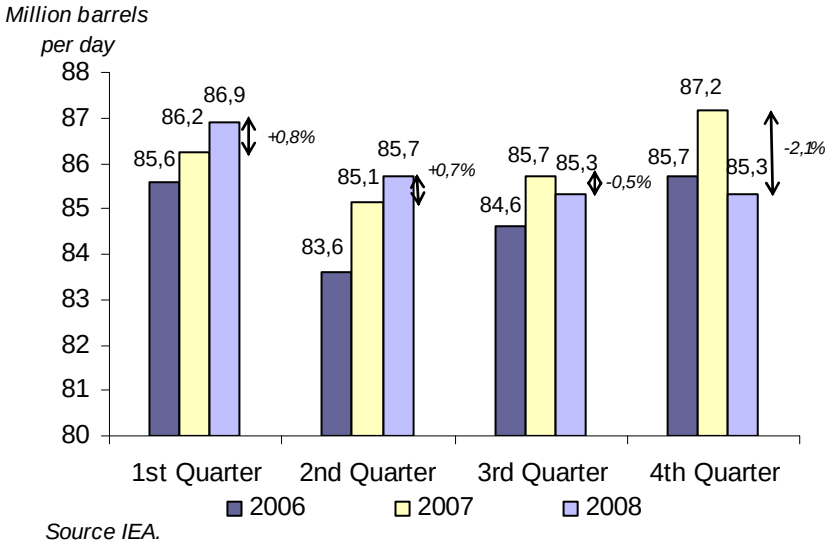
282. As mentioned above, demand for crude from each company with refining operations depends on its production capacity, on the expectation for demand for products refined from crude in its area of influence and on changes in stocks.

Changes in demand

283. The changes recorded in world demand for crude during 2006, 2007 and 2008 (based on the most recent data from the AIE[48]) are illustrated in the chart below:

[48] The data in this document are those used by the IEA in its update of 16 January 2009.

Chart 12 – Changes in world demand for crude from 2006 to 2008



Source IEA.

284. According to the AIE, world demand for crude grew by 0.8% in the first quarter of 2008 and 0.7% in the second quarter (in year-on-year terms).

285. International demand for crude during the first quarter of the year grew fundamentally as a result of the following factors:

- Lower than normal temperatures in Germany, Japan, and South Korea, leading to an increase in demand for heating in these regions;
- Increase in demand in Europe: consumption of fuel increased in Germany, France and Italy, boosted by an increase in the number of vehicles;
- Increase in demand for fuel for transport in Canada, Mexico, Iran and Russia;
- Increase in demand in India due to the growth in consumption of fuel for transport and the needs of the agricultural sector. Demand was also boosted by the low retail prices fixed administratively;
- Increase in demand in China, especially for transport during the festivities marking the public holiday for the new lunar year (in spite of the storms that paralysed part of the country), and for the agricultural and industrial sectors. Additionally, the increase in demand was underpinned by the reconstruction work that followed the snowstorms at the start of the year;
- The use of derivatives from crude for the production of energy in Japan, due to maintenance operations on nuclear power stations during the first months of 2008.

286. The increase in world demand for crude during the second quarter of the year resulted fundamentally from the following factors:

- Increase in demand in China (2.9% in April, 1.6% in May and 6.2% in June) as a result of economic growth and rise in the number of fuel-powered vehicles;
- Growth in demand for fuel for road use as a result of the increase in the number of fuel-powered vehicles for transport in India, in particular in April and May (only mitigated by the administrative decision to raise the price of fuel by more than 10% in June);
- Increase in the use of products refined from crude for the production of energy as a result of smaller production from the nuclear plant in Japan and from natural gas in Australia (as a result of production problems).

287. From the third quarter of 2008, there was a fall in the global demand for crude, down 0.5% compared with the same quarter of 2007.

288. The fall in world demand for crude during the third quarter of 2008 can be fundamentally explained by the following factors:

- A major contraction in demand in OECD countries, above all in North America (down by 3.7% in August) and in the Pacific rim countries (down by 4.4% in the same month) with the international financial crisis impacting on the decisions of economic agents and with the high prices for fuel charged in the summer (reaching all-time highs);
- More moderate growth in demand in India (3.1%), hampered by the monsoon rains;
- A slowdown of growth in demand in China. In spite of the increase in consumption in June and August (6.2% in June and 6.8% in August), spurred by economic growth and the organisation of the Olympic Games, come September the rate of growth in demand had fallen to 3.9%, a figure close to the figure at the end of 2007.

289. In the fourth quarter of 2008 and compared with the same quarter of the previous year, world demand fell more steeply (by 2.1%), to stand at 85.3 mb/d, compared with 87.2 mb/d in the fourth quarter of 2007.

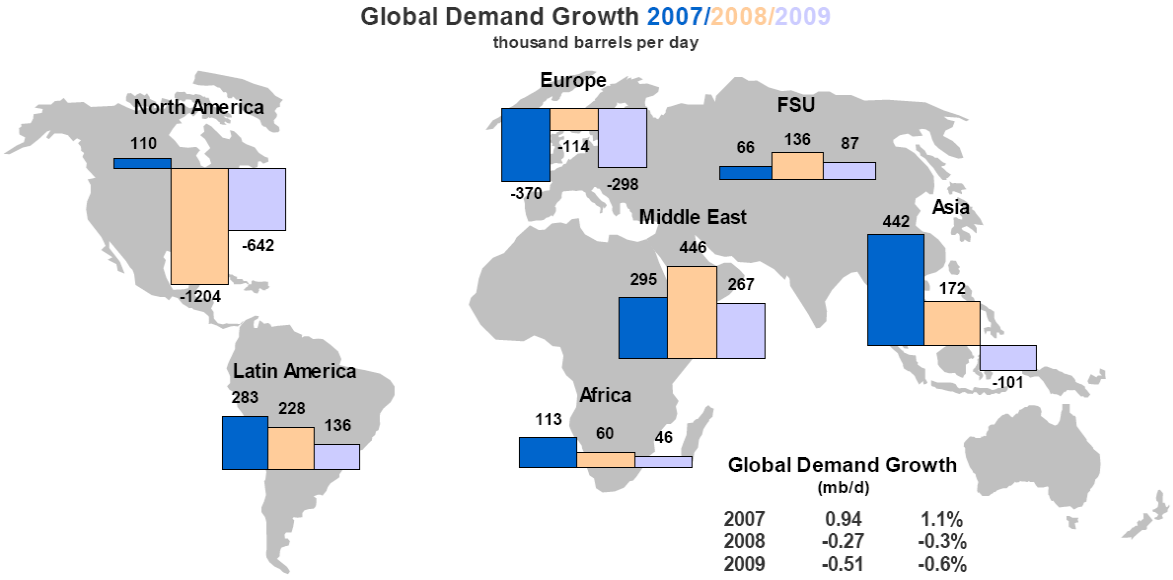
290. The fall in world demand for crude during the fourth quarter of 2008, compared with the fourth quarter of 2007, can be explained fundamentally by the following factors:

- There was big slump in demand in OECD countries, above all in North America and in the Pacific Rim countries. In North America and Latin America demand fell by 6.9% in November as a result of the international economic and financial crisis. In the Pacific Rim countries, the fall in the same month reached 10.7%, explicable, in large part, by weak demand in Japan (down by 12.3%) and in South Korea (down by 12.6%);
- There was a fall in the level of growth in China. There had been an increase in consumption in the summer (in June it was up 6.2% and in August 6.8% in year-on-year terms), stimulated by economic growth and the organisation of the Olympic Games, but in November demand for crude fell by 1.9% (the first downward move since 2005). This was basically due to the bleak international economic scene, which had a direct negative impact on the country's exports (especially to OECD countries);
- The fall in world demand was mitigated to some extent by growth in demand in India (up 2% in November compared with the same month in 2007). It was held up mainly by the strong demand for gasoline (up 5.8%) and diesel (up 8.8%) as a result of the relatively low prices of fuel (prices fixed administratively and subsidised by the State).

291. So it was that 2008 ended with the figure for world demand down by 0.3% compared with 2007. This fall went against the expectations of the IEA, which had indeed made a succession of lower forecasts, but was still at the start of the fourth quarter forecasting that 2008 would come in with a figure for growth in world demand of 0.1%.

292. The AIE estimates for growth in demand for crude in 2009 across the globe are shown on the following map:

Illustration 5 – Growth in world demand for crude in 2007 and 2008 and an estimate for 2009 (in thousands of barrels/day)



Source: IEA.

293. According to the IEA's January forecasts, world demand for crude in 2009 looks to be down by 0.6%. If this occurs, it will be the first time since the start of the 80s with two consecutive years recording a fall in world demand for crude.

294. This expectation for a fall in demand is fundamentally associated with a reduction in consumption in North America and Europe in the wake of the economic recession that has gripped most of the major countries in these regions. The high price of fuel compared with the average of recent decades and turmoil in the financial markets has translated into global economic instability.

295. In a very significant revision of their forecasts for consumption of crude in the countries of Asia, the AIE forecast now is that in 2009 overall demand for crude will also fall in this region as a result of the major slowdown in the Chinese economy. The crisis that has affected the more developed countries has had a direct impact on the contraction in demand and in smaller volumes of exports.

296. The international recession that has hit the more developed economies seems now too deep and widespread, and outstrips the expectations for

growth in demand from the Middle East, Latin America, Africa and the former USSR.

297. Even so, the most recent AIE forecasts for 2009 continue to point towards a growth in demand for crude in Africa, the former USSR, Latin America and the Middle East, even though at levels lower than previous forecasts (the former USSR: down by 103mb/d; Latin America: down by 202 mb/d; and the Middle East: down by 299 mb/d).

5.3. World supply of crude

The structure of supply

298. Currently, the world supply of crude is dominated by the countries belonging to the Organisation of Petroleum Exporting Countries (OPEC), by Russia and by the USA.

299. The main companies operating on the supply side all belong to sovereign states which are members of OPEC. They include the Saudi Arabian Oil Company, the National Iranian Oil Company, Qatar Petroleum; the Abu Dhabi National Oil Company, the Iraq National Oil Company, Gazprom, the Kuwait Petroleum Corporation, Crudes de Venezuela, SA, the Nigerian National Petroleum Corporation, the National Oil Corporation (Libya), Sonatrach, and Rosneft.

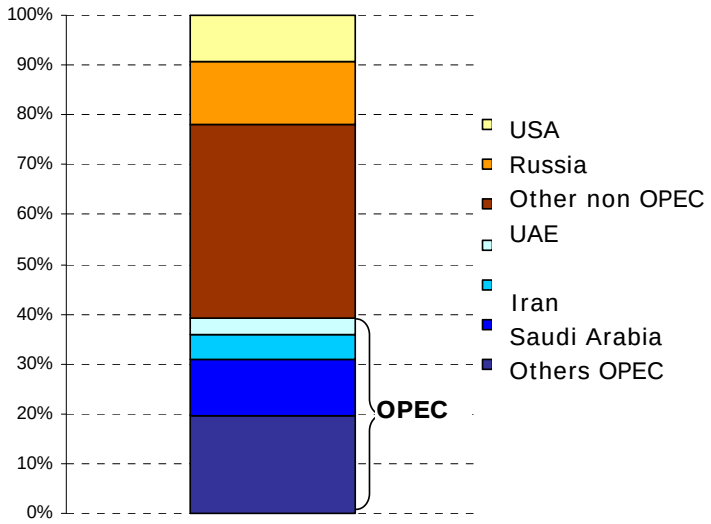
300. The OPEC countries, taken together, accounted for 39% of total world supply in the third quarter of 2007.[49] Saudi Arabia, Iran and the United Arab Emirates were responsible in this quarter for 11%, 5% and 3% respectively of total world supply, (representing 29%, 13% and 8% of the total supply of OPEC).

301. Among the producer countries not belonging to OPEC, Russia and the USA stand out, the first with 13% and the second with 9% of global supply in the third quarter of 2007.

302. The remaining countries which do not belong to the cartel (among them Norway, Mexico, China, Canada, Brazil and so on) accounted for 39% of supply in this quarter.

[49] The last quarter for which there is information allowing for a detailed analysis.

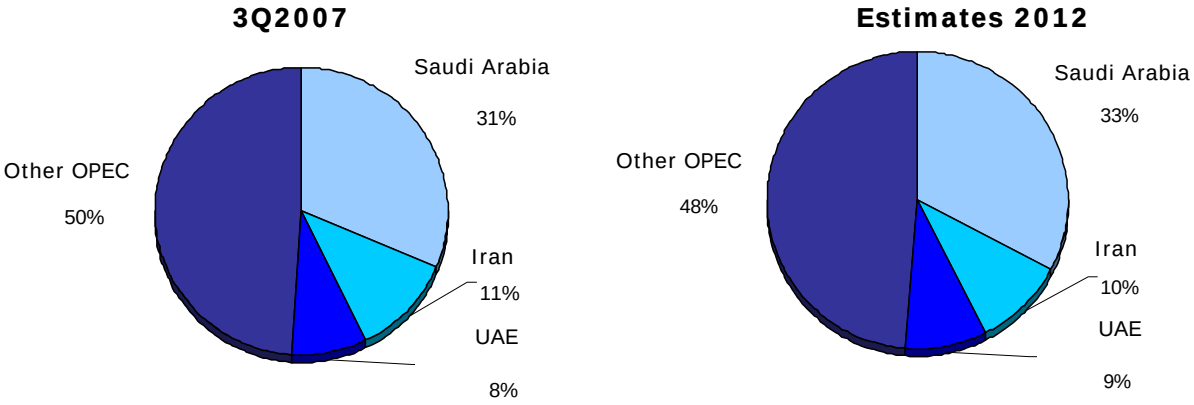
Chart 13 – Share of the global supply of crude in the third quarter of 2007



Source: IEA, Medium-Term Oil Market Report – July 2007.

303. In specific terms relating to the third quarter of 2007, the productive capacity of OPEC, according to AIE estimates,[50] broke down into Saudi Arabia (with 31%), Iran (with 11%) and the United Arab Emirates (with 8%), the remaining 50% coming from the other members of the cartel.

Chart 14 – OPEC productive capacity distribution in the third quarter of 2007 and estimates for 2012



Source: IEA, Medium-Term Oil Market Report – July 2007.

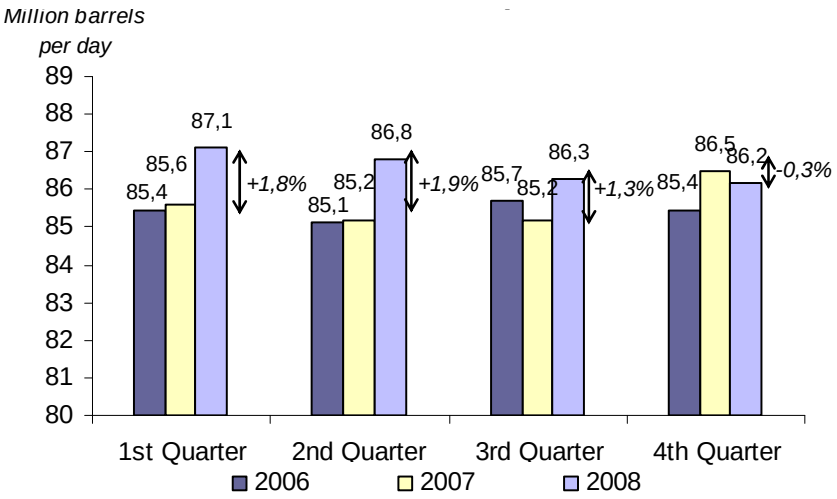
[50] *International Energy Agency* (2007a), *Medium-term Oil Market Report – July 2007*, Paris.

304. In 2012, according to IEA projections,[51,52] the productive capacity of OPEC will grow by 11.4%, using the third quarter of 2007 as the base line, with Saudi Arabia, Iran and the United Arab Emirates still the countries with the highest productive capacity, on 33%, 10% and 9% of the total respectively.

Changes in supply

305. In 2007 the global supply of crude reached an average level of 85.6 mb/d, a 0.1% growth over the average level of 2006 (85.5 mb/d).

Chart 15 – Changes in the global supply of crude from 2006 to 2008



Source IEA.

306. In the three first quarters of 2008, the supply of crude grew by 1.8%, 1.9% the 1.3% compared with the same periods in 2007.

307. The increase in supply of crude recorded in the first quarter of 2008 was justified by:

- New production in Brazil, and a pick-up in production in Azerbaijan, China and Mexico in January;
- Increase in supply from Iraq, Angola, Indonesia and Nigeria in February;
- Increase in production from Iran, North America, Latin America and China in March.

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51 *International Energy Agency* (2007a), *Medium-term Oil Market Report – July 2007*, Paris.

52 The cartel does not publish any projections for production so as not to influence expectations in the markets. They have regular conferences in which they decide production quotas in accordance with an analysis of the fundamentals.

308. The increase in supply of crude in the second quarter of 2008 was related to:

- New production in Brazil, and a pick-up of production in Azerbaijan, China and Kazakhstan in April;
- Increase in production from Saudi Arabia in May and June;
- Record post-war production in Iraq in May;
- Increase in production from Russia and China in May;
- Increase in production from Nigeria in May.

309. The increase in supply in the third quarter of the year was associated with:

- Start of new production in Angola;
- Increase in production from Libya and Venezuela due to the end of maintenance operations;
- Increase in production from the North Sea;
- Increase in production from Australia and New Zealand;
- Increase in production in September from Alaska due to the end of maintenance operations.

310. In the fourth quarter of 2008, supply reached 86.2 mb/d, compared with 86.5 mb/d in the same quarter of 2007.

311. This variation is a 0.3% fall over the fourth quarter of 2007, and a 0.1% fall over the third quarter of 2008.

312. The contraction in supply during the fourth quarter of 2008 is related with:

- Cuts in OPEC production, with particular reference to Saudi Arabia and Kuwait in the months of November and December;
- Continued fall in production from Russia, recorded since the start of the 2008 (the first year of reductions since 1996);
- An increase, although more moderate, in production from Angola.

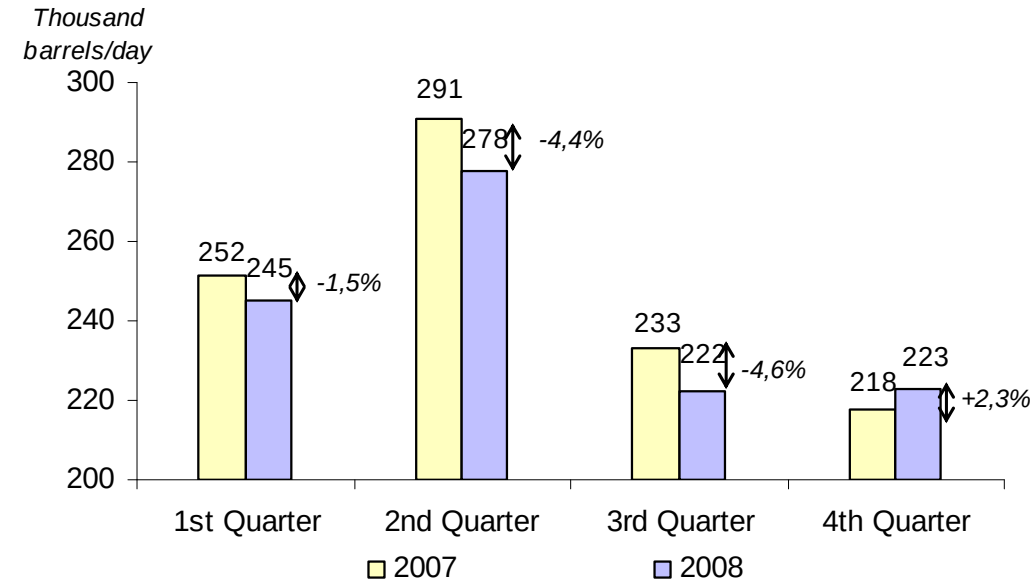
313. During every quarter of 2008, the rate of growth in supply of crude was higher than demand. This phenomenon had a visible impact on the prices of crude, in particular during the second half of 2008, as detailed in section 5.6 below.

5.4. Domestic demand for crude (imports)

314. Since there is no production of crude on Portuguese territory, domestic demand must be satisfied through imports.

315. In the chart below, it is possible to see the changes in imports of crude over the four quarters of 2007 and 2008.

Chart 16 – Changes in the imports of crude in Portugal from 2007 to 2008



Source: Analysis by the Portuguese Competition Authority based on data from Galp Energia.

316. The first quarter of 2008 was characterised by a slight fall in the imports of crude, down by 1.5% compared with the same quarter of 2007.

317. Even so, the amount of crude processed in domestic refineries in this quarter looks to have grown by 4.4%, contributing to the fall in stocks in this period.

318. The reduction in imports of crude in 2008 was clearer in the second and third quarters of the year, when volume fell by 4.4% and 4.6% respectively.

319. This fall was associated with the fall in domestic processing of crude (which looks to have fallen in the third quarter by 17.6% compared with the same period of 2008) as a result of the fall in consumption of refined products.

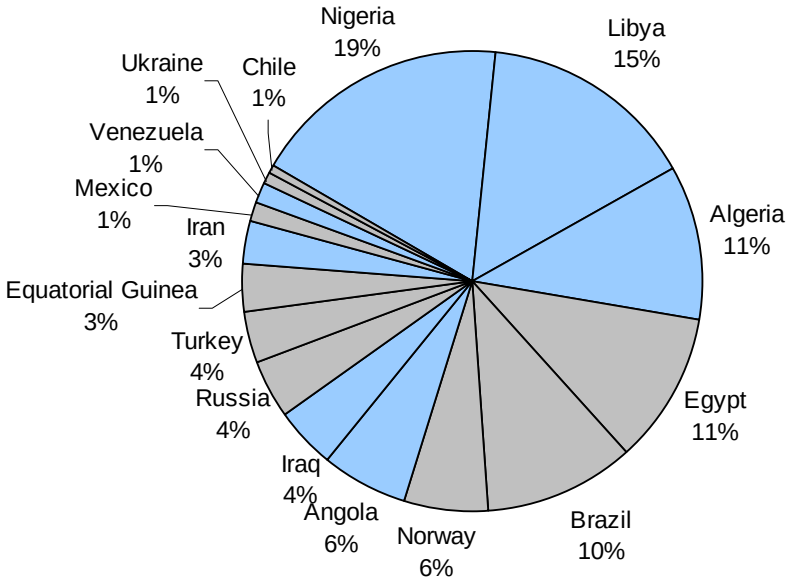
320. According to the most recent published data from Galp, imports of crude in the fourth quarter of 2008 increased as a result of the need to build up stocks, which had fallen in all the previous quarters of the year, and to the

increase in processing in the domestic refineries (by 3% in the fourth quarter of 2008 compared with the previous quarter).

321. In 2008, in aggregate terms, Portugal recorded a 2.3% fall in the imports of crude compared with 2007 and the quantity of crude processed in domestic refineries also fell by 2.3%.

322. In terms of geographical spread, the impression is that Portugal has a diversified structure of imports of crude in terms of countries, as shown in the chart below.

Chart 17 – Source of imports of crude in Portugal during the first 9 months of 2008



Source: Analysis by the Portuguese Competition Authority based on data from APDL and APS

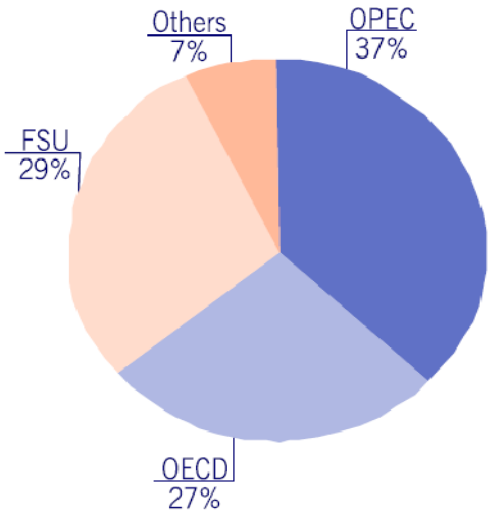
323. During the first nine months de 2008,[53] the main suppliers of crude for domestic refineries were Nigeria (19%), Libya (15%) and Algeria (11%).

324. In spite of the apparent diversity in sources for crude, however, Portugal is very dependent on supplies from the OPEC countries (coloured light blue in the chart above), which account for 59% of all imports.

[53] Up to the date of publication of this report, it was not possible to aggregate the data relating to the fourth quarter of 2008.

325. For a comparison, as mentioned in section 5.3, OPEC accounts for around 39% of the global supply of crude and 37% of the crude processed in European refineries comes from OPEC countries.

Chart 18 – Origin of crude processed in Europe in 2007



Source: IEA; BPI Equity Research.

5.5. Domestic supply of crude

326. As already mentioned, the domestic sector imports all of the main raw material (crude).

327. This does not mean, however, that there is no crude in the country, nor that prospection is non-existent.

328. The first prospection for crude in Portugal was at the start of last century. The drilling was not very deep and was near rocks impregnated by crude at the surface ("seeps"), and on shore, north and south, in the Lusitânica basin.

329. The 1950s were marked by more intense and ever deeper drilling.

330. These operations were again gaining momentum in the second half of the 1970s.

331. So it was that, from 1978 to 2004, 39 areas were allocated, among them 23 concessions onshore in the Lusitânica basin (two of these were in fact sites offshore as well as onshore), 15 concessions were "offshore" (11 in the

Oporto basin, 3 in the Algarve basin and 1 in the Lusitânica basin) and 1 licence for initial assessment in the "deep-offshore" of the Algarve basin.

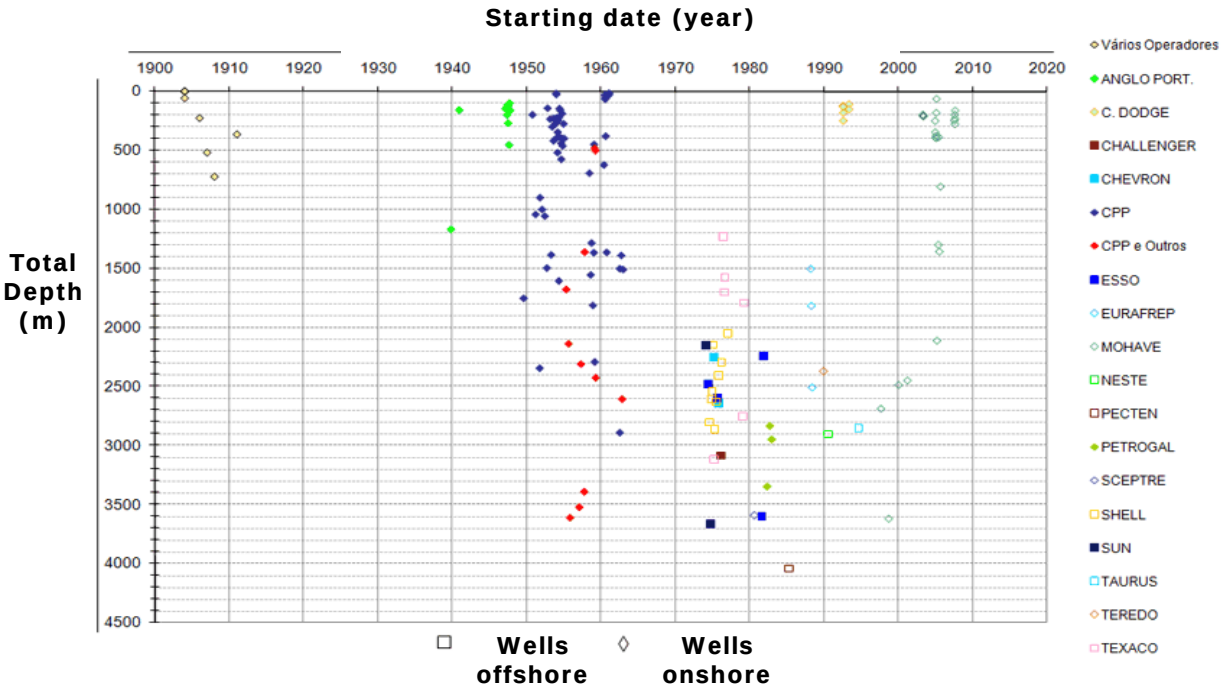
332. At the end of 2006, only one company was operating in Portugal (Mohave Oil & Gas Corporation, headquartered in Houston/EUA), holding 2 onshore concessions for the Lusitânica basin.

333. More recently, in 2007, there was another increase of interest in prospection for crude in Portugal.

334. In that year, there were 12 exploratory concessions put out for the production of crude (On/Offshore - the Lusitânica basin; Deep Offshore - the Peniche basin; Deep Offshore - the Alentejo basin), awarded to three consortiums: 1) Hardman / Galp / Partex; 2) Petrobras / Galp / Partex; and 3) the Mohave Oil & Gas Corporation.

335. In the table below it is possible to see the different periods and the intensities of exploration for crude in Portugal.

Chart 19 – Date of the start and depth of drilling for crude in Portugal from 1900 to 2008



Source: DGEG.

5.6. The international price of crude used as a reference

336. As explained in paragraphs 267 and following, there is no one single quality of crude but rather a range of types of crude with different quality (including for instance different densities) and different prices.

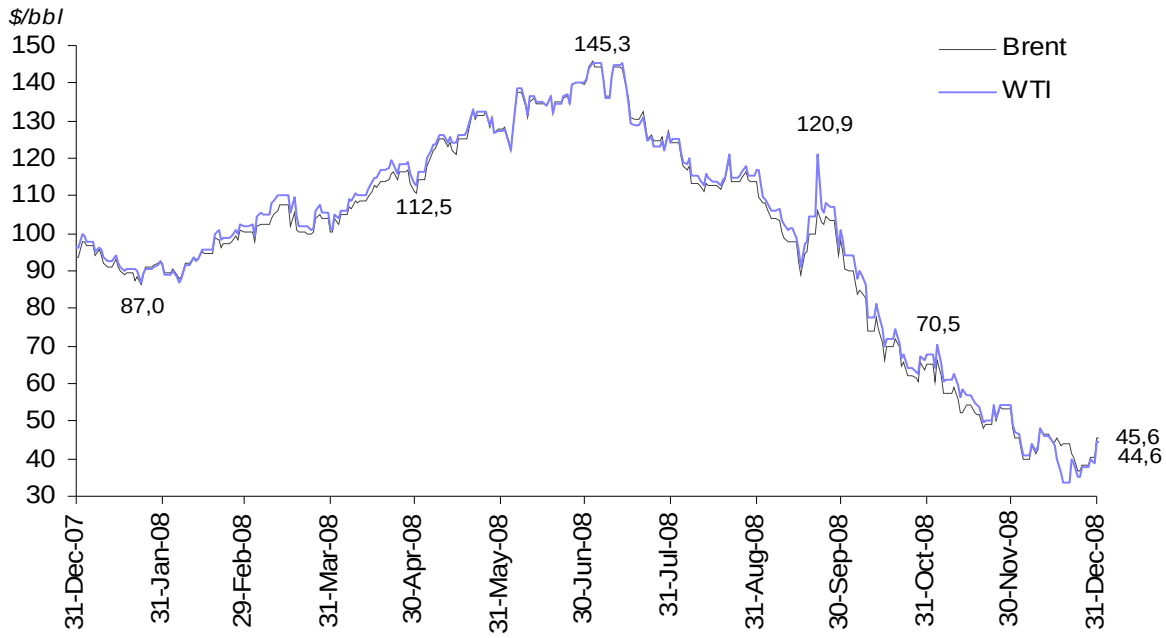
337. Normally the specifications Brent (Crude) and Western Texas Intermediate (WTI) – see paragraph 269 – act as a yardstick for the prices of other types of crude.

338. Brent is the crude used as a reference in the European market, and therefore the Portuguese market also.

339. The international price of crude is quoted in USD/barrel and therefore, in order to understand the impact of changes in domestic prices, it is important to understand not only how the quotation changes, but also how the EUR/USD exchange rate changes.

340. The chart below shows the changes in the prices of Brent and WTI futures in USD per barrel during 2008.

Chart 20 – Changes in the prices of contracts for Brent one-month futures and WTI quoted in USD per barrel in 2008



Source: Reuters.

341. One of the features of 2008 was the extreme volatility of prices for crude.

342. In the first half of 2008, there was an unbroken increase in the price of Brent and WTI one-month futures quoted in USD, following a trend that had set in at the start of 2007.

343. In January 2008, the prices of Brent and WTI one-month futures were being quoted below 100 USD/barrel, while at the start of July these prices had gone beyond the 140 USD/barrel mark.

344. In the third quarter of 2008, however, the trend reversed, with a substantial fall in the international quotations for Brent futures and the WTI.

345. In one quarter, the total rise in the first six months of 2008 was wiped out. Indeed, after the maximums recorded at the start of July 2008, when prices of futures contracts for crude went above 140 USD/barrel, at the end of September these prices were again around 100 USD/barrel.

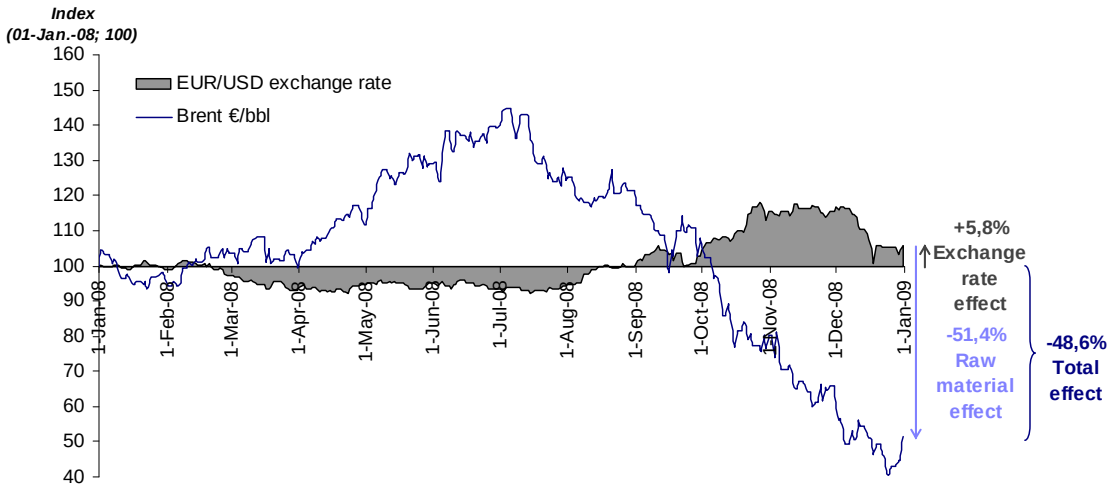
346. In the fourth quarter of 2008, the steep falling trend in the prices of Brent one-month futures continued and the figure reached 45 USD/barrel at the end of December.

347. On aggregate, from 1 January 2008 to 31 December 2008, the prices of Brent one-month futures quoted in USD fell by 51.4%.

348. When translated into EUR/barrel this reduction was 48.6%, in other words, it was more moderate, as a result of the rise in the value of the dollar against the euro (+5.8%).

349. In the chart below, it is possible to see the impact of the changes in the EUR/USD exchange rate on the prices in euros for Brent futures during 2008:

Chart 21 – Changes in the prices of contracts for Brent one-month futures quoted in EUR per barrel, and of the EUR/USD exchange rate in 2008



Source: Analysis by the Portuguese Competition Authority based on data from Reuters and the ECB.

350. What this meant was that there was a fall in the value of the dollar against the euro until mid-August with Europe benefiting from the effect of the increase in the quotation for crude in USD during this period.

351. However, there was a change in the exchange rate trend from mid-August 2008 as the dollar moved up against the euro. As a result, the price of crude when quoted in euros reflected a smaller fall compared with the price of crude quoted in dollars.

352. In terms of average quarterly prices, the table below shows the changes in the prices of Brent one-month futures when quoted in euros.

Table 5 – Average quarterly price of Brent one-month futures (€/bbl)

	2007	2008	Change between periods year on year	Change between periods year on year (%)
1st Quarter	44.8	64.2	19,5	43%
2nd Quarter	51.0	78.9	27.9	55%
3rd Quarter	54.3	77.7	23.4	43%
4th Quarter	61.2	43.4	-17.9	-29%
Annual	52.9	66.0	13.2	25%
Change from 4Q2007 to1Q2008		3.0		
Change from 1Q2008 to 2Q2008		14.7		
Change from 2Q2008 to 3Q2008		-1.2		
Change from 3Q2008 to4Q2008		**-34.3**		
Change from 4Q2007 to1Q2008 (%)		5%		
Change from 1Q2008 to 2Q2008 (%)		23%		
Change from 2Q2008 to 3Q2008 (%)		-2%		
Change from 3Q2008 to4Q2008 (%)		**-44%**		

Source: Analysis by the Portuguese Competition Authority based on data from Reuters and the ECB.

353. The average quarterly price in euros of Brent one-month futures in 2008 was €64.2/bbl in the first quarter, €78.9/bbl in the second, €77.7/bbl in the third and €43.4/bbl in the fourth.

354. These prices, when compared with the previous quarter, represent an increase of 3.0 euros per barrel in the first quarter and 14.7 euros per barrel in the second quarter, a fall of 1.2 euros per barrel in the third quarter and 34.3 euros per barrel in the third quarter.

355. As a result, the fall in the value of crude futures which occurred in the second half of the year cancelled out completely all the upward move that had been witnessed since at least 2007.

356. If we compare the price in the fourth quarter of 2008 with that of the same quarter in 2007, we will see a 29% (€17.9) fall in the average price of Brent futures in euros.

357. Even so, in aggregate terms, the average price of Brent futures converted into EUR/bbl was €66.03/barrel in 2008, which translates into a 25% increase from the €52.9/barrel recorded in 2007.

5.7. The purchase price of crude in the domestic refineries

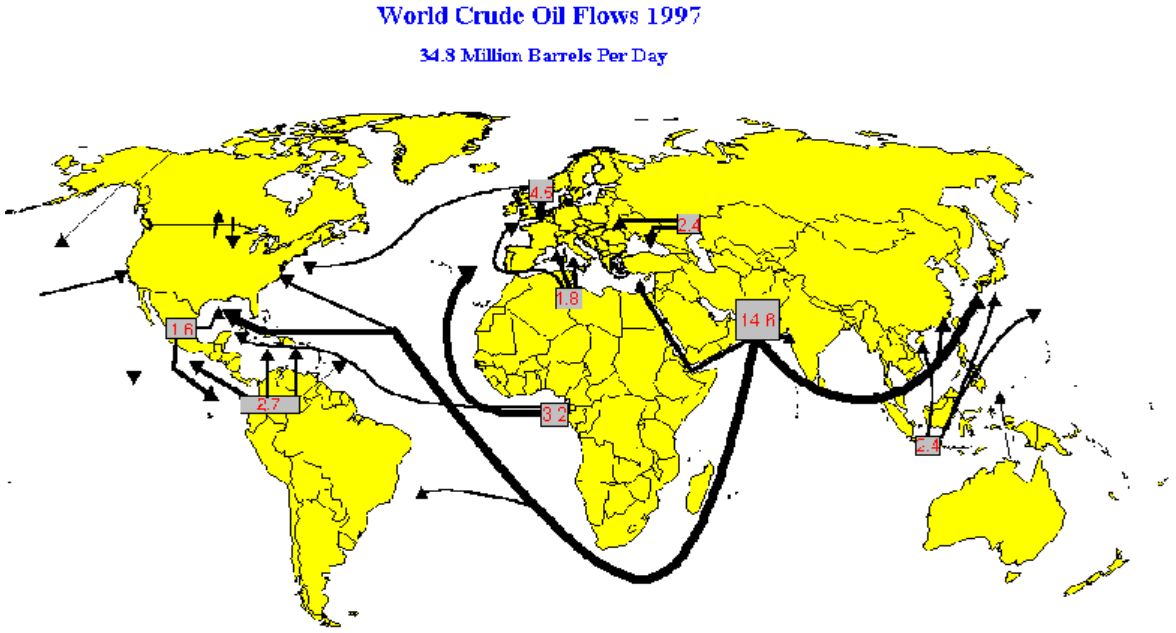
358. As mentioned in paragraph 255 and following, in spite of the fact that each of the refining companies did not have the capacity by itself to influence in any relevant way the market price of crude, this does not mean that at any one moment the refining companies pay the same price for the crude they acquire.

359. In fact, the cost of acquiring crude at the refineries varies and depends fundamentally on:

- The international prices used as a reference;
- The geographical location of the refinery (that is, of the transport costs between the production site of the raw material and the site of refining);
- The quality of crude purchased in relation to the production specifications that the refineries must adhere to.

360. In terms of imports of crude, Portugal benefits from a privileged geographical location which means that the country can take crude from practically any part of the world. It is also close to important routes for transporting crude, such as those that link the north of Africa and western Africa to northwest Europe (see the illustration below).

Illustration 6 – World flows of crude in 1997[54] (to a total of 34.8 million barrels/day)



Source: EIA.

361. Portugal also benefits from the fact that the two refineries it has can process heavier kinds of crude than those normally used as a reference in international markets.

362. This combination of technical characteristics in the country's domestic refining facilities and its privileged geographical location means that it is possible for domestic refineries to import in 2007 heavier types of crudes (with an API gravity[55] of 35.71º, by comparison with the 38.9º API gravity of Brent), and moreover benefit from lower transport costs (bearing in mind the sea routes for crude and the fact that it is closer than other north west European countries to two important centres for the production of crude – the west coast of Africa and north Africa). This meant that in 2007 the average prices for purchase of crude by domestic refineries was 4% lower than the reference price (Brent).[56]

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54 The latest year for which data are available.

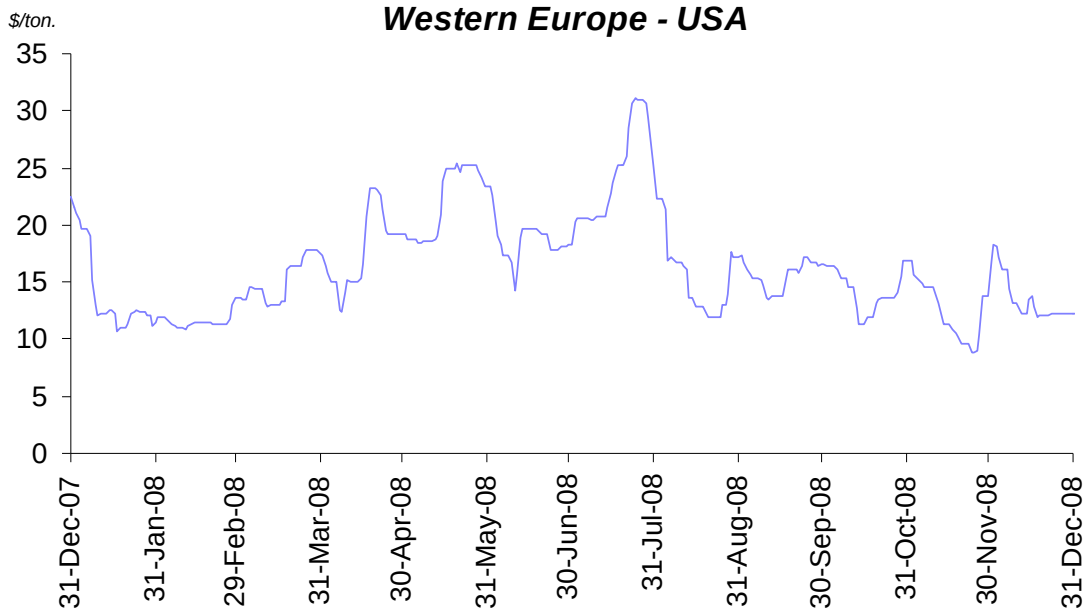
55 API gravity – This is a measurement of the relative density of liquid crude compared with water, adopted by the American Petroleum Institute (API). The smaller the API gravity, the bigger the relative density.

56 *Cf.* Galp Energia – Annual Report 2007.

5.8. The cost of maritime transport for crude

363. 2008 was characterised by big volatility in the prices of maritime transport of crude, as can be seen from an analysis of the chart below:

Chart 22 – Price of maritime transport of crude on the Western Europe-USA route in 2008



Source: Reuters (N-Sea-USAC-130kT - dirty - Spot).

364. The year began with the price of maritime transport of crude on the Western Europe-USA route (for 130,000 tonnage) quoted at 22.5USD/ton. During January there was an abrupt fall in prices to around 11USD/ton to 12USD/ton. These figures remained relatively stable until the end of February.

365. From March to July 2008, prices for maritime transport moved up, with the figure going beyond 30USD/ton at the end of July.

366. This increase was associated with more demand for long distance transport of crude as a result of the increase in production by exporting countries.

367. August saw a sudden fall in the price of maritime transport for crude, coming down to near 15USD/ton on the Western Europe-USA route (for 130,000 tonnage). This was 50% down on the previous month.

368. This reduction was associated above all with the drop in demand for maritime transport as important maintenance periods in the refining facilities

came near and it was also influenced by the increase in stocks of crude during July. In addition, the slowdown in demand for refined products reduced the incentive of the refineries to go ahead with purchase orders for more crude.

369. The September to December period was characterised by the relative stability of transport costs for crude, which for the Western Europe-USA route (for 130,000 tonnage) was around 12USD/ton.

5.9. Conclusions

370. The markets for crude are characterised by the existence of a cartel of producer countries which accounts for around 39% of the supply (2007 data) and fixes production quotas for its associates.

371. Any limitation in supply causes an increase in prices of crude in the international markets.

372. On the demand side, there are a number of companies with refining operations which are part of economic groups with refining complexes of global reach. Individual size, however, is too small to make a significant impact on the price of crude.

373. Even less, of course, would the only two refineries in Portugal be able to influence the price of crude, since they are responsible for less then 1% of world demand for crude.

374. The two domestic refineries are relatively small in terms of world demand, but they are able to purchase crude at prices below the main reference for prices in Europe, Brent crude (4% below in 2007). There are two reasons for this. Firstly, the country's geographical location, and secondly the specific characteristics of its refineries (types of crude processed and the yield from production), meaning that heavier types of crude can be used.

375. To sum up, in 2008 the price of crude and of other raw materials accounted for 30% of the average pump price of 95-octane gasoline in Portugal and 40% of diesel for road use and is not controllable, nor can it be controlled, by economic agents operating in Portugal at the different stages of the value chain.

376. In recent years there has been a considerable and steady increase in the price of crude. In large part, this rise was related with the pressure caused by growing demand for this natural, non-renewable resource.

377. The global economic growth seen up to mid-2008, particularly in Asian countries and in the Middle East, led to a considerable growth in demand for crude for transport, industry and the production of energy.

378. The upward pressure on the prices of crude is caused by a number of factors, among them the rigidity of response on the supply side, through the actions of OPEC, and the time taken by oil companies in investing in new productions.

379. From the second half of 2008, the expectations were for a slowdown in economic growth and for some countries to move into recession. This caused expectations of an increase in demand to cool, contributing to the fall in prices of crude internationally.

380. Portugal's domestic refineries have a relatively high exposure to imports from OPEC countries.

381. In fact, the supply of crude from OPEC countries accounted for around 59% of the total that was imported in the first nine months of 2008, a substantially higher figure than the proportion of OPEC in the global supply (39%) and in the supply of crude to European refineries (37%).

6. Refining operations and imports of liquid fuels for road use in Portugal

6.1. Introduction

382. As mentioned in paragraph 179, crude oil cannot be used in its natural form and needs to be processed at industrial plants (refineries) to obtain refined products.

383. It is important therefore, first and foremost, to understand the framework of refining operations and the import of liquid fuels for road use in Portugal and their role in the sector's value chain.

384. Refining operations and imports are part of what is commonly known as sales ex-refinery/cargo ("ex-refinery/cargo sales") and make up the first level of distribution of fuel for road use.

385. In general, the ex-refinery/cargo level includes sales of large amounts[57] of gasoline and diesel for road use directly from the refineries (domestic and international), at the gates of their facilities, or delivered on primary transport (generally pipeline, ship or train) to client terminals (storage points).

386. In Portugal, ex-refinery/cargo sales may therefore be either sales by domestic or international refineries. In the latter case, there is an import of liquid fuel, not of crude.

387. These operations are different from bulk sales of gasoline and diesel for road use (commonly known as "non-retail sales"), to the extent that they make up a second level of distribution after the first.

388. In chapter 6 the conditions for competition in ex-refinery/cargo sales will be analysed and in chapter 8 there will be an analysis of the conditions for competition in the bulk sales of gasoline and diesel for road use.

389. After purchase from domestic or international refineries, the products are stored in import depots connected by means of large transport (pipelines

[57] Transport in barges with volumes between 2,000 and 5,000 tons; transport by pipeline with volumes of between 4.000 and 12.000 tons; transport in tankers with up tp 80,000 tons and transport by train with between 2.500 and 3.000 tons.

and barges), and it is then possible to route the refined products to distribution depots around the country.

390. The products are then sold from sites known as distribution depots. These are smaller than import depots, and they allow for storage near points of sale (service stations) to which the products are transported by truck.

391. In ex-refinery/cargo purchases, there exists a regime of temporary exemption from tax (specifically the ISP) – see section 3.5.

392. On the supply side, the companies with refining operations in Europe (and at times across the world when there is a shortage in production of one of the products in Europe), among them Galp (the only company with refining operations in Portugal) compete for the supply of gasoline and diesel for road use on the terms mentioned above.

393. In ex-refinery/cargo sales, the comparative advantages of a refinery (or of an economic group with refining operations) will be greater the closer it is to centres of consumption (and naturally to the storage depots of their clients), and the greater the logistical difficulties associated with imports of fuel (for instance in terms of the sea ports and import depots, among other items), which exhert some competitive pressure on the refinery's outputs .

394. On the demand side, ex-refinery/cargo clients in Portugal are normally companies that are in retail sales of fuel, bulk vendors of fuel and traders who normally possess or can rent large capacity storage depots.

395. This chapter will describe the supply and demand for gasoline and diesel for road use on an ex-refinery/cargo basis (section 6.2.), followed by the characteristics of the refining operations of crude (subsection 6.2.1) and the activity of importing fuel for road use (subsection 6.2.2).

396. There will then be details on how ex-refinery prices are reached in Portugal (section 6.3), with details of the bargaining power of purchasers and vendors (subsections 6.3.1 and 6.3.2.1) and the way obstacles hinder penetration and expansion in imports of fuel and have an effect on the price (subsection 6.3.2.2).

397. This will be followed by an analysis of changes in the ex-refinery prices/cargo of fuel for road use in Portugal in 2007 and 2008 (section 6.4).

398. As a last point, the margins in the refining operations in Portugal will be analysed in section 6.5.

6.2. Characteristics of supply the demand for gasoline and diesel for road use on an ex-refinery/cargo basis

6.2.1. Characteristics of the refining operations in Portugal

399. On the demand side there were four economic groups that made ex-refinery purchases of fuel for road use in Portugal in 2008 (Galp, BP, Repsol, and Cepsa).

400. The remaining operators (i.e. those that are not oil companies) are the independents and the supermarket chains. They buy in the bulk markets rather than purchasing ex-refinery.

401. On the supply side, around 4.8 thousand million litres of diesel for road use and around 2.9 thousand million litres of gasoline were produced in Portugal in 2007.[58]

402. Most of the diesel for road use produced was for domestic demand, and part of the gasoline was for export.

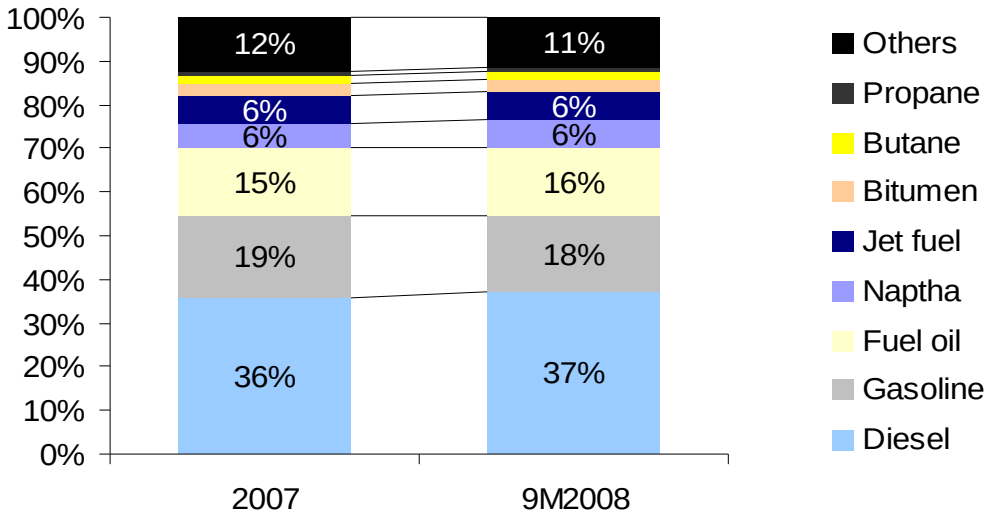
403. In 2008,[59] 93% of the gasoline consumed in Portugal was produced in domestic refineries and 81% of domestic consumption of diesel for road use was guaranteed by domestic production.

404. The production of fuel for road use represented 55% of the refining operations of crude in Portugal in 2007 and in the first nine months of 2008.

[58] The most recent year with definitive data up to the date that this report was prepared.

[59] Based on information from the first 9 months of 2008.

Chart 23 – Relative importance of fuel for road use in domestic refining operations in 2007 and in the first nine months of 2008



Source: Analysis by the Portuguese Competition Authority based on data from Galp Energia.

405. This supply from domestic sources was guaranteed by the two Portuguese refineries, one in the north, in Leça da Palmeira (Matosinhos), and the other in Sines, which is in the south.

406. Both these refineries are owned by the oil company Galp.

407. The main characteristics of the domestic refineries are described in the table below.

Table 6 – Main characteristics of the domestic refineries

	SINES REFINERY	REFINERY DE LEÇA DA PALMEIRA
Owner	Galp Energia Group	Galp Energia Group
Start of operations	1979	1969
Capacity of refining	220 thousands de barrels per day (mbopd)	90 thousands of barrels per day (mbopd)
Type	*Cracking*	*Hydroskimming*
Brief description	• Includes two units for vacuum distillation, one *FCC*[60], a *Visbreaker*[61] and two units for hydro-desulfuration of diesel; • Produces gasoline reformulated since the 90s for export to North America.	• Include a plant for fuel, a plant for aromatics, a plant for base oils and a plant for mixtures of lubricants; • Production of p-Xylene, o-Xylene, toluene and benzene for the Portuguese market and export.
Nelson complexity index[62]	5.3	6.9
Solomon complexity index[63]	7.6	7.9
Storage capacity	3.031 thousand m^3	1.986 thousand m^3
Number Of employees	458	471

Source: 2007 Annual Report of Galp Energia, SGPS.

408. The Sines refinery is most recent and has a productive capacity around 2.44 times higher than Leça da Palmeira.

409. The Sines refinery is connected by pipeline to the port of Sines and Leça da Palmeira is connected by pipeline to the port of Leixões.

[60] FCC – "*Fluidic Catalystic cracking*" is the most important conversion process used in crude refineries.

[61] *Visbreaker* is a processing unit in a refinery, the main aim of which is to reduce the quantity of residual oil in the distillation of crude bruto and increase the quantity of intermediate refined products of greater value in the market (fuel for heaing and diesel).

[62] The distillation capacity of a refinery is determined by its complexity, which is a technical measurement used as an efficiency indicator and potential yield. Complexity is normally measured by reference to the Solomon or Nelson complexity indices. Both these indices are cacluated using a formula that gives a complexity factor for each of the main refining processes (based complexity and on cost) and the importance of each factor is given a weighting by reference to its output.
For example, a refinery with a complexity index of 10 is considered to be 10 times more complex than the basic dstilation of crude for the same output. On the other hand, although greater complexity can indicate the capacity to produce goods with a higher value and to reach higher gross margins, it can also increase operating costs. Therefore greater complexity does not guarantee better profitability. More details on the complexity indices can be found in the Glossary.

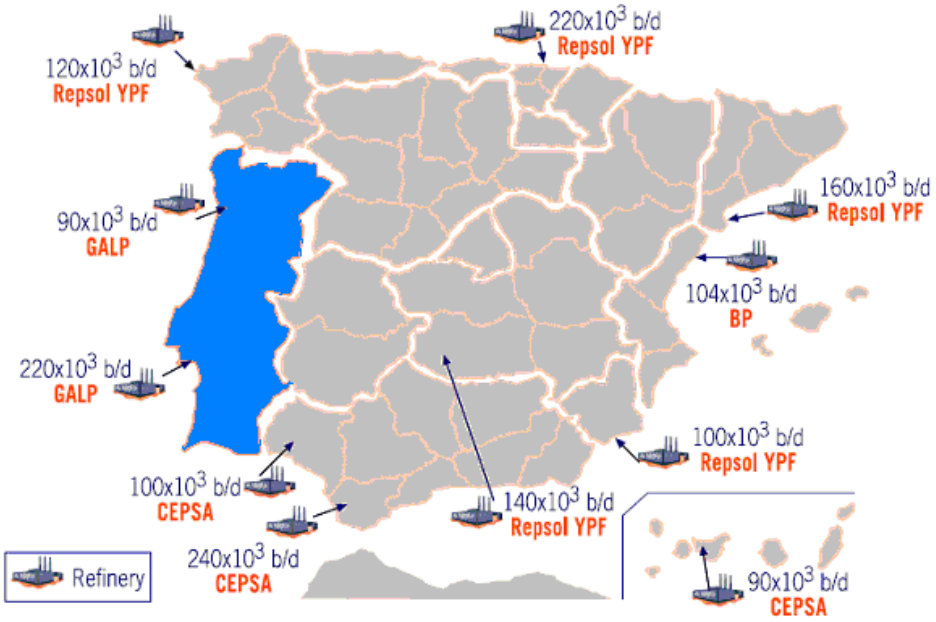
[63] *Idem*.

410. The Sines refinery supplies [60-65%] of diesel for road use on Portuguese territory and [50-55%] of the gasoline, including the south and centre of the country and in particular the region of Lisbon and Vale do Tejo, with this last supplied from a storage site in Aveiras. This is connected to Sines by the only long distance pipeline in Portugal.

411. The Sines refinery is also responsible for the supply of the autonomous regions, providing also refined products to cover production shortfall at the refinery in Leça da Palmeira.

412. The refining capacity of Galp in Portugal in 2008, accounted for the equivalent of 20% of the refining capacity in the Iberian Peninsula, shown in the illustration and table below.

Illustration 7 – Refineries in the Iberian Peninsula in 2008



Source: CLH; BPI Equity Research.

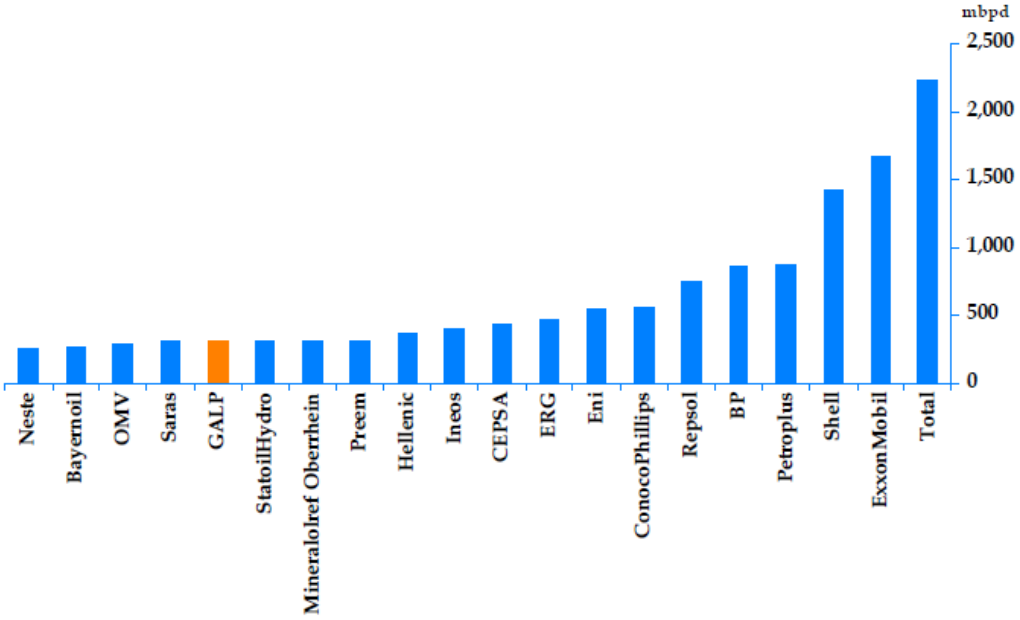
Table 7 – Refineries and refining capacity in the Iberian Peninsula in 2008

Country	Company	Refinery	Capacity	
			kbbl / day	*% Iberia*[64]
Portugal	Galp	Leça da Palmeira	90	20%
		Sines	220	
Spain	Repsol	Somorrostro Vizcaya	220	47%
		Cartagena, Múrcia	100	
		La Coruña	120	
		Puertollano, Ciudad Real	140	
		Tarragona	160	
	Cepsa (Total)	Cádiz	240	27%
		Huelva	100	
		Tenerife	90	
	BP	Castellón de la Plana	104	7%

Key: The refining capacity is expressed in thousands de barrels (kbbl) per day.
Source: CLH; BPI Equity Research.

413. Within the EU15, Galp was the 16th biggest economic group with refining capacity. The main economic groups in refining products deriving from crude in the EU15 were Total, Exxon Mobil, Shell, Petroplus, BP and Repsol.

Chart 24 – Refining capacity in the EU15 (including all the companies with aggregate refining capacity higher than 250 thousand barrels per day) in 2008



Source: Oil & Gas Journal, 2008 Worldwide Refining Survey; and Hart Energy Publishing.

64 The column headed "% Iberia" is the percentage of capacity for each company in the Iberian Peninsula.

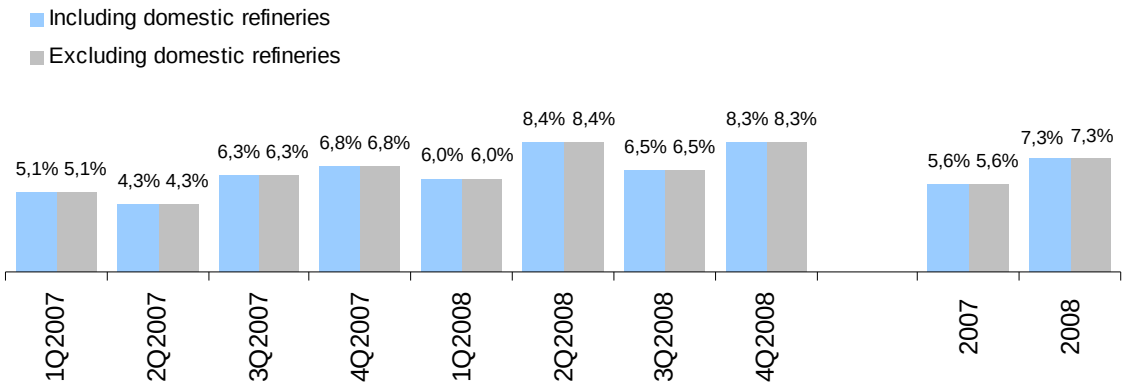
6.2.2. Characteristics of import operations for gasoline and diesel for road use on an ex-refinery/cargo basis

414. In 2008, around a thousand million litres of diesel for road use and 144 million litres of gasoline were imported.

415. In terms of gasoline, the proportion of imports for domestic consumption was very low, around 6% in 2007 and 7% in 2008.

416. The domestic refineries can produce more gasoline than needed, so they did not import gasoline during 2007 and 2008. The imports that were made were by other operators.

Chart 25 – Relative proportion of imports of gasoline for domestic consumption in the four quarters of 2007 and 2008



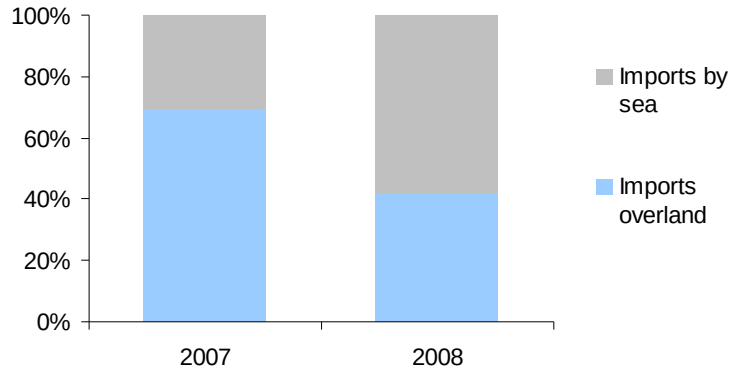
Source: Analysis by the Portuguese Competition Authority based on data from the DGEG, Galp, Repsol, BP, Agip, Esso, Petrin, Alves Bandeira, Cipol, Leclerc, Auchan, Jerónimo Martins.

417. A large part of gasoline imports results from purchases by domestic retailers (in this case, the oil companies) from some Spanish wholesalers, whose area of influence goes in some cases beyond Spanish territory (as can be found in section 7.1.)

418. The storage depots in Huelva and La Coruña, for example, are at times used for the supply of service stations near the Portuguese border with Spain.

419. An analysis of imports per type of transport that in 2007 around 70% and in 2008 around 40% of the imports of gasoline into Portugal came overland, as shown in the chart below.

Chart 26 – Relative proportion of gasoline imports per type of transport in 2007 and 2008



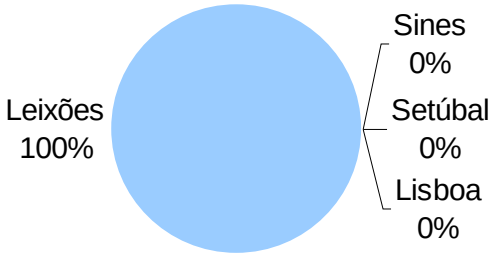
Source: Analysis by the Portuguese Competition Authority based on data from the DGEG, Galp, Repsol, BP, Agip, Esso, Petrin, Alves Bandeira, Cipol, Auchan, Continente, ITMI, Leclerc, J. Martins.

420. In actual fact, the oil companies operating in Portugal also have secondary distribution in Spain, which they use for supplying some of the service stations near the border.

421. In 2007, only one company operating in Portugal imported gasoline by sea and in 2008 only two.

422. Imports of gasoline by sea during 2007 all used the port of Leixões, as can be seen in the following chart.

Chart 27 – Relative importance of each seaport in the imports of gasoline in 2007



Source: Analysis by the Portuguese Competition Authority based on cross checks and reconciliation of information supplied by the port authorities, Galp, BP, Repsol, Cepsa, Esso.

423. In 2007,[65] Portugal had one of the lowest rates of gasoline imports in the EU15.

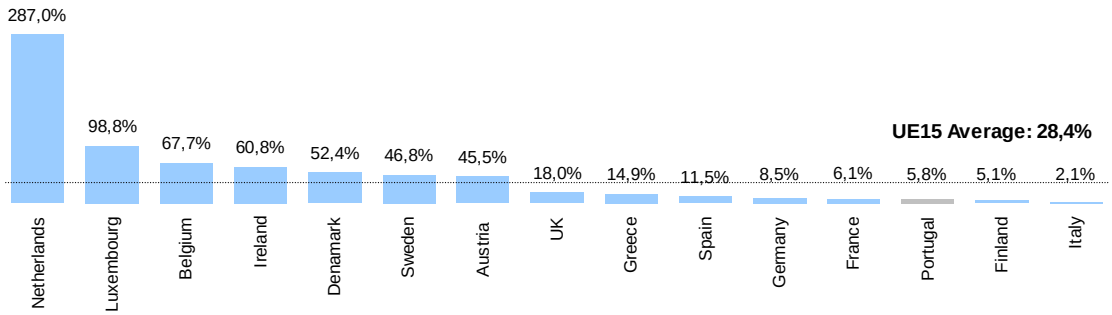
424. On average in the EU15, 28.4% of domestic consumption of gasoline results from imports whereas the figure for Portugal in 2007 was under 6%.

425. Only Finland and Italy had a lower percentage of imports (see the chart below).

426. It should be mentioned, however, that Finland and Italy have a producer profile that is a little different from Portugal's, to the extent that they are countries with a substantially higher level of refining barrels of crude per capita than Portugal, and they are very export oriented (see Chart 34).

427. There is also a proviso in the comparisons that must be mentioned: both the Netherlands and Belgium act as a launch pad for sales of refined products, and this pushes up the EU15 average.

Chart 28 – Relative proportion of the imports of gasoline in consumption in the EU15 in 2007



Source: Analysis by the Portuguese Competition Authority based on information from the IEA.
1) Includes gasoline for road use, gasoline for aircrafts and jet fuel

428. In terms of diesel for road use, the proportion of imports in domestic consumption was also relatively low, although it was higher than gasoline, with the figure standing at 14% in 2007 and at 19% in 2008.

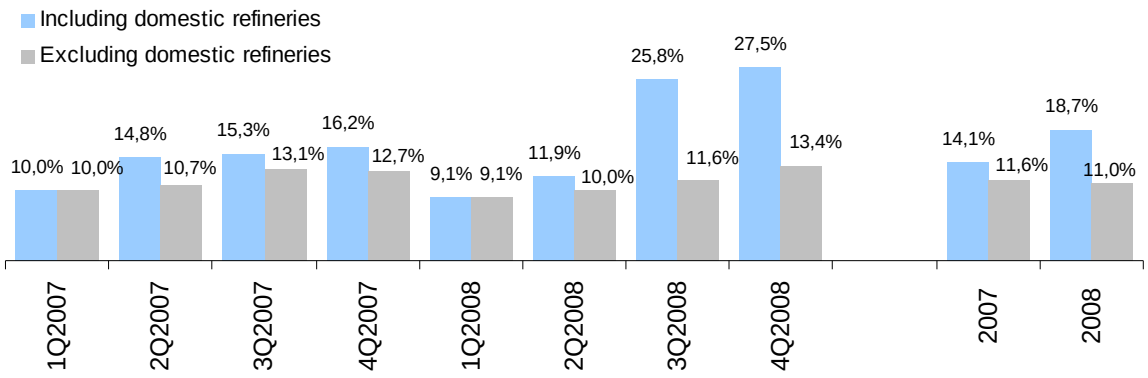
429. Since Portuguese refineries cannot produce enough diesel for road use, they imported this fuel in 2007 and 2008 to make up for the shortfall. Leaving this figure out, the proportion of imports that other agents made for domestic consumption was 11.6% in 2007 and 11.0% in 2008.

[65] The last year for which statistics were available for the EU.

430. In large measure, the bigger proportion of imports of diesel compared with gasoline in Portugal is related to two things: on the one hand, to the fact that the relative price of gasoline compared with diesel makes it more attractive, and on the other hand, the fact that domestic refineries produce a surplus of gasoline, and therefore do not import this fuel, unlike diesel, which they do.

431. On the possible influence of these characteristics on Portuguese refining operations, where there is a surplus in the production of gasoline and a shortfall in the production of diesel (see subsection 6.3.2 below).

Chart 29 – Relative proportion of imports of diesel for road use in domestic consumption in the four quarters of 2007 and 2008

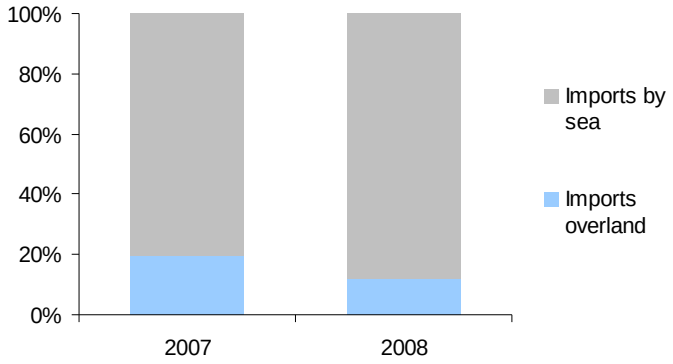


Source: Analysis by the Portuguese Competition Authority based on data from the DGEG, Galp, Repsol, BP, Agip, Esso, Petrin, Alves Bandeira, Cipol, Leclerc, Auchan, Jerónimo Martins.

432. In terms of diesel for road use, only a small portion of imports came by road from Spain (less than 20% of the total during 2007 and 2008).

433. Most imports of diesel for road use in Portugal in 2007 and 2008 came by sea, as illustrated in the chart below.

Chart 30 – Relative proportion of the imports of diesel for road use per type of transport in 2007 and 2008

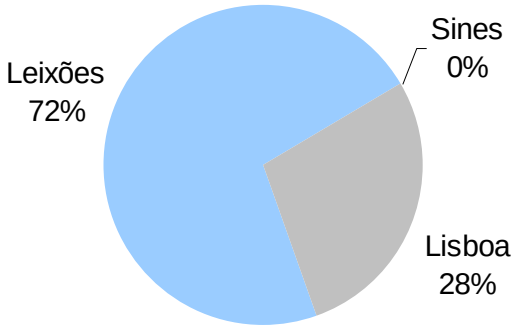


Source: Analysis by the Portuguese Competition Authority based on data from the DGEG, Galp, Repsol, BP, Agip, Esso, Petrin, Alves Bandeira, Cipol, Auchan, Continente, ITMI, Leclerc, J. Martins.

434. Imports of diesel by sea in 2007[66] came in mostly through the port of Leixões (72%), although there were also imports through the port of Lisbon (28%) as shown in the chart below.

435. In 2007,[67] there were no imports of diesel through the port of Sines.

Chart 31 – Relative importance of each seaport in the imports of diesel for road use in 2007



Source: Analysis by the Portuguese Competition Authority based on cross checks and reconciliation of information supplied by the port authorities, Galp, BP, Repsol, Cepsa, Esso.

436. In 2007 and 2008, five companies imported diesel by sea (Galp, BP, Repsol, Cepsa and Esso), although only three (Galp, BP and Repsol) brought in volumes higher than 40,000 m^3 for the year.

[66] The last year for which it is possible to reconcile the figures provided by the oil companies and by the sea ports.

[67] It was not possible to consider 2008 since there very significant divergencies for this year between the data provided by the sea ports and by the oil companies.

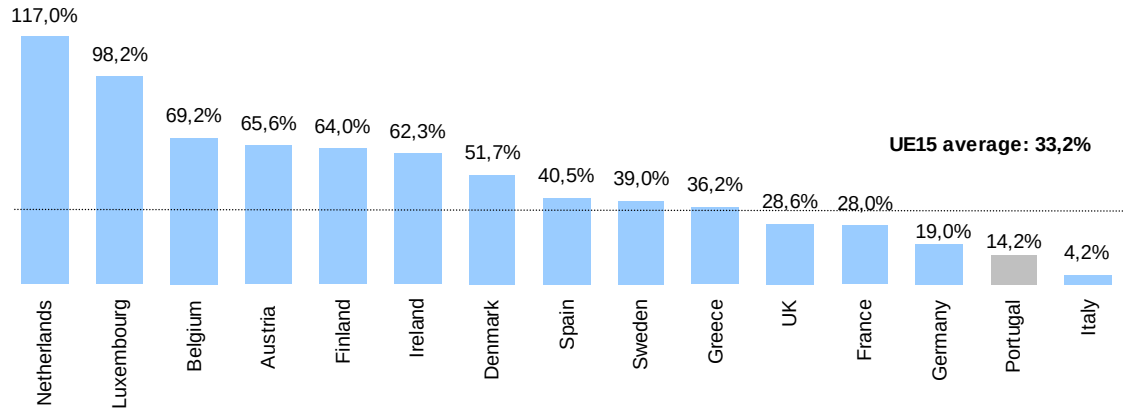
437. In comparative terms, Portugal had one of the lowest rates of import of diesel in the EU15 in 2007,[68] as with gasoline.

438. On average in the EU15, 33.2% of domestic consumption of diesel for road use in 2007 resulted from imports. In Portugal, this percentage was under 14% (or 12% if imports made by the domestic refineries to cover the production shortfall are left out).

439. Only in Italy is there a lower percentage of imports, as shown in the chart below.

440. It should be mentioned, however, that Italy has a producer profile that is different from Portugal's, to the extent that it has a substantially higher level of refining barrels of crude per capita than Portugal, and is very export oriented (as can be seen in chart 33).

Chart 32 – Relative proportion of imports of gasoline in consumption in the EU15 in 2007



Source: PCA analysis based on data from IEA.
1) Includes diesel fuel, heating oil, agricultural diesel, gas oil bunker, and diesel fuel for petrochemical production.

6.3. How ex-refinery prices/cargo of fuel for road use are reached in Portugal

6.3.1. The import parity price (IPP)

441. In principle, and in the absence of any barriers to import, each purchaser, at each moment, can decide whether to acquire fuel for road use as needed

[68] The last year for which there are statistics available for the EU.

from a domestic refinery or imported from a refinery located outside Portugal.

442. Given this, fuel for road use is a tradable good and the ex-refinery price depends not directly on the price of crude and of the costs of refining at domestic refineries, but rather on the price that the purchaser has to pay for this product at other refineries, plus transport costs and other relevant spreads for the site chosen for storage in Portugal.

443. The price so determined is what is commonly termed the import parity price (IPP) corresponding to the price (FOB) in the international markets for fuel for road use, plus transport costs, insurance, discharge and wharfage.

444. Basically, the IPP would be the cost incurred if the same product were purchased abroad and was then brought to Portugal and delivered to a domestic import depot. In other words, the IPP is the maximum level that the ex-refinery price can reach if there are no obstacles to imports.

445. The IPP can be summed up in the following formula:

IPP = Price of fuel for road use in the market used as a reference + bonus for quality + transport costs from the market used as a reference to Portugal and insurance + costs with seaports + wharfage.

446. Or even more succinctly:

IPP = Price of fuel for road use in the market used as a reference + relevant spreads.

447. With no logistical or other obstacles in the way of imports, no domestic refinery would be prepared to sell at a price significantly below the IPP to the extent that they would know that potential purchasers would have no alternative for supply at a lower price.

448. In the same way, in this position, no refinery would be able to put a higher price on the IPP, even if this implied a negative net refining margin due to the high price for purchase of crude or the high costs of refining, to the extent that if an ex-refinery price was put forward higher than the IPP, the potential purchaser would opt for imports.

449. It is important in the first place, for this reason, to analyse in greater detail the various components in the IPP as it relates to Portugal, and in the second place, to assess whether there are barriers to the import of fuel for

road use that may be able to justify differences between the ex-refinery price charged in Portugal and the IPP.

6.3.2. The price of fuel for road use in the market used as a reference

450. The prices negotiated in Europe, and also in Portugal, for the purposes of imports of fuel for road use are generally indexed to the quotations for refined products published by Platts for transactions carried out with refineries in north western Europe (from here on called NWE) or in the Mediterranean (from here on called MED).

451. Platts is a company in the McGraw Hill Group and publishes a daily figure that is used as a reference for each of the different specifications of refined products traded in Europe, using what it considers to be the market value of the product at 16:30 hours London time, based on information provided by traders dealing in the products concerned.

452. Platts is therefore not a stock market, nor a platform for regulated trading. It is more of a system of information on transactions of crude and refined products. For example, it fixes the reference prices for these products, commonly known as Platts, for different price centres in Europe, and as indicated below, there are two price centres: Rotterdam and Lavera.

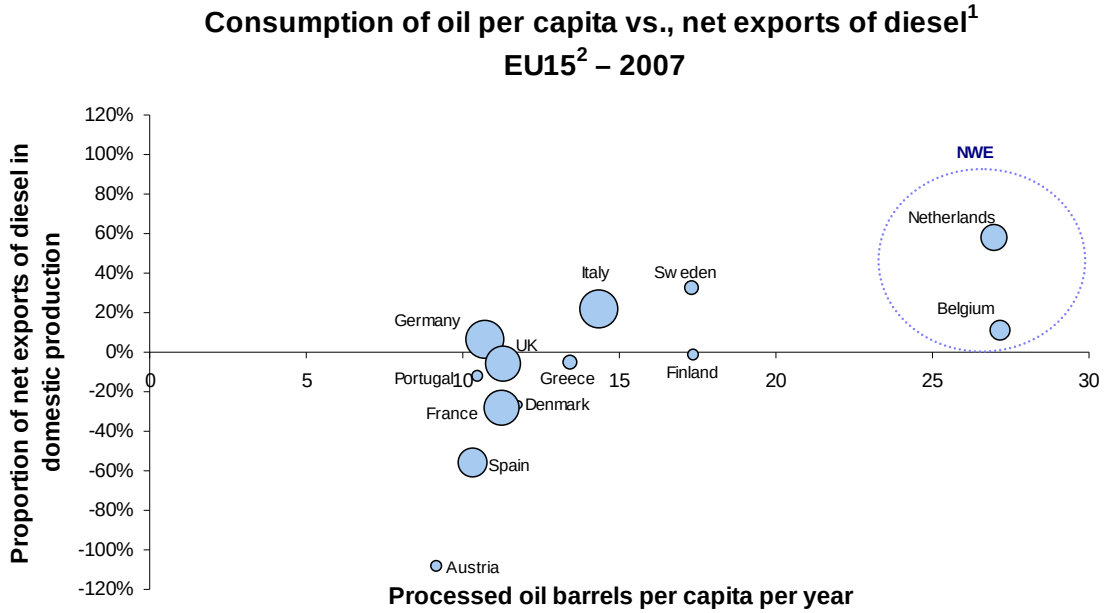
453. The use of a reference price based on Platts has been a common practice for many years all over the world, including Portugal, the rest of Europe and the USA.

454. Within the Platts reference prices, those relating to transactions in gasoline and diesel for road use in the ARA region, also known as NWE (Northwest Europe), are the most frequently used by the oil industry in Northwest Europe, given its closeness and its liquidity.

455. The Platts reference prices relating to transactions in gasoline and diesel for road use in the region of Genova/Lavera, also known as MED (Mediterranean), are the most frequently used by the oil industry in the Mediterranean region.

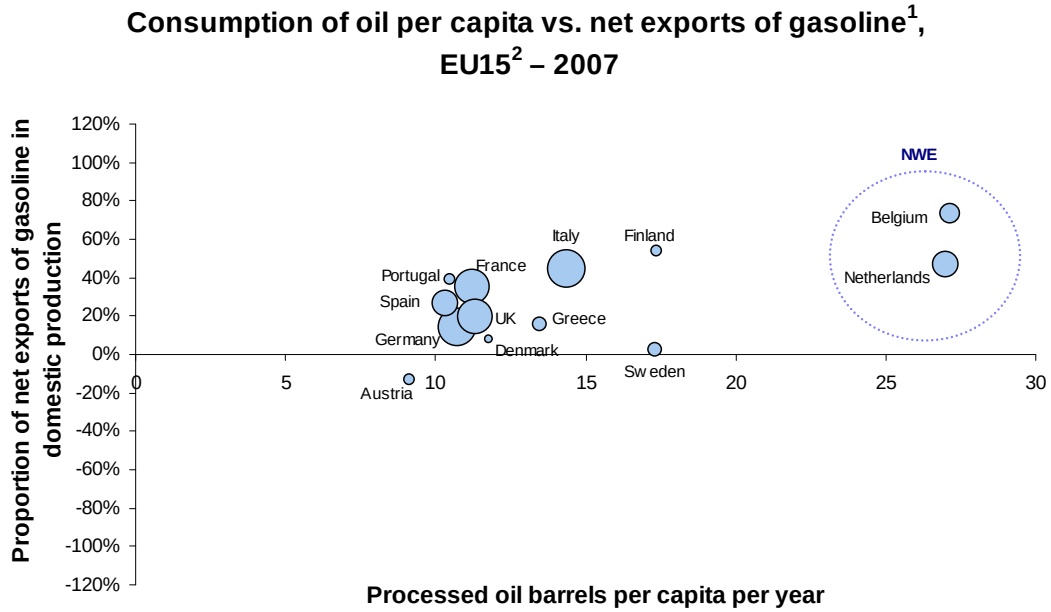
456. The charts below show very clearly the export thrust and the relevance of the refining facilities in the countries that serve as a reference for reaching the Platts quotations for NWE and also for Portugal.

Chart 33 – Production and exports of diesel in the EU15 in 2007



Source: Analysis by the Portuguese Competition Authority based on information from the IEA and OECD.
Note: The size of the circles for each country reflects the country's refining capacity, expressed in bbl/day.
1) Includes diesel for road use, for heating, for agriculture, for bunkers and for petrochemicals.
2) Excludes Ireland, where the proportion of net exports in domestic consumption is -204%.

Chart 34 – Production and exports of gasoline in the EU15 in 2007



Source: Analysis by the Portuguese Competition Authority based on information from the IEA and OECD.
Note: The size of the circles for each country reflects the country's refining capacity, expressed in bbl/day.
1) Includes gasoline for road use, gasoline for aircrafts and jet fuel.
2) Excludes Ireland, where the proportion of net exports in domestic consumption is -217%.

457. The Netherlands and Belgium have a per capita refining capacity for gasoline and diesel nearly twice the other countries in the EU15. They have a level of exports net of imports, in particular the Netherlands in the case of diesel and Belgium in the case of gasoline, accounting for between 60%-80% of the domestic production of fuel in those countries, and they also have a refining capacity which in absolute terms is relatively high.

458. Until the end of 2008,[69] the reference prices taken for the IPP base formula for Portugal, were the Platts prices (NWE) for a given specification of gasoline (Premium gasoline 50ppm for 95-octane gasoline) and diesel (Diesel 50ppm for diesel for road use).[70]

459. As a last point here, and bearing in mind the rules imposed by the publishers of Platts on traders and on the specifications of the products they publish the price of, the number and volumes of transactions based on which the reference price of the product is determined may raise issues that only a *supra*-national competition authority would be in a position to clarify.

6.3.3. Quality premium

460. In most cases, the domestic specifications of gasoline and of diesel for road use correspond to the specifications reported by Platts and therefore there is no need to add or subtract any factor that would provide an additional correction to the Platts prices so that they would reflect domestic specifications.

461. In terms of fuel for road use, the exception is 98-octane gasoline, for which there is no specific Platts specification.

462. In this case, since it is more expensive to refine and/or purchase 98-octane gasoline than 95-octane gasoline, a spread is added to the Platts quotations for 10ppm gasoline with a 95-octane index to set the ex-refinery price of 98-octane gasoline.

463. This spread is called a “quality premium”.

6.3.4. The costs of transport (freight) by sea and insurance

464. To reach the IPP from Platts quotations, using FOB as the basis, it is important at the start to add on the cost of freight by sea from the point

[69] In 2009, the specification for fuel in Portugal was changed, for environmental reasons, with the number of particles of sulpher per million reduced from 50 to 10.

[70] Platt’s is the FOB price, based on a deal for a tanker of 30,000 tons (± 10%) for gasoline and equivalent to 20,000 tons for diesel, to be loaded in a period of time between 10 and 25 days.

where FOB is charged (in the Portuguese case, the ARA region), to a specific seaport for discharge (in the Portuguese case, the ports of Sines and Leixões, which are connected by pipeline to the domestic refineries).

465. The costs of freight are calculated on the basis of daily freight quotations or, in other words, the unit cost of transport for the product, and an index known as Worldscale.

466. Quotations for freight are usually based on standardisations relative to the variables (i) size of the ship, and (ii) contractual conditions for the journey involved.

467. The size of the tanker is one of the basic variables for the competitiveness of freight. The bigger the tanker the smaller the cost of transport per unit of measurement.

468. To adjust the different dimensions of the ships and the characteristics of the ports at each end of the route, a Worldscale points system is used. It is possible in this way to make a calculation adjusted to the freight on a specific journey.

469. An analysis of the imports of fuel for road use by sea to Portugal shows that in spite of the big volatility in the markets, the most frequent sizes of tankers are 20,000 to 30,000 tons (with the average being 22,000 tons) for diesel and 5,000 to 15,000 tons for 95-octane gasoline (with the average being 8,000 tons). For this reason, these were the dimensions used for the calculation of the IPP.

470. Quotations for freight vary daily.

6.3.5. Costs with seaports

471. To calculate the IPP, the FOB quotations for refined products and the freight charges have to be considered, but it is also important to consider the costs of loading and discharge at the seaports in the country.

472. In specific terms, to determine the IPP for Leça da Palmeira (for a comparison with the ex-refinery price there) it is important to know the average cost for discharge at the port of Leixões (the port that serves this refinery), and to determine the IPP for Sines (for a comparison with the ex-refinery price there) it is important to know the average cost for discharge at the port of Sines (the port that serves this refinery).

473. These costs include a range of services which vary from port to port and include, for example, the rates for using the port, the rates for discharge and others.

474. These costs are normally based on EUR/ton, but in some ports in the country (for example Leixões) there are different price bands which depend on the total quantity offloaded. In general terms, the bigger the load discharged, the smaller the unit cost of the goods.

6.3.6. Costs with wharfage

475. The import of fuel for road use implies wharfage, normally related to evaporation, losses at interfaces (that is, in the transfer of a product from one place to another).[71]

476. For this reason, the quantity received in the import depots is normally lower than the quantity loaded at the port of departure, and therefore losses are incurred. This wharfage can be translated into percentages of the quantity lost.

477. It is therefore necessary to take the costs associated with wharfage into consideration in the IPP formula. These costs result from an increase in the unit cost of the product stemming from the loss in quantity.

6.3.7. The relative proportion of each of the components in the structure of the IPP

478. Some of the components of the IPP have a specific proportion fundamental for its structure.

479. In particular, the major item in the structure of the IPP for fuel for road use in Portugal is the price of fuel in the market used as a reference, that is, the NWE.

480. This component accounted for more than 95% of the IPP of 95-octane gasoline in Sines and in Leça da Palmeira in 2007 and 2008.

481. The second most relevant component was freight by sea (including insurance), and this accounted for only around 2.9% in 2007 and 1.7% in 2008 no IPP in Sines, and 3.9% in 2007 and 2.3% in 2008 of the IPP in Leça da Palmeira.

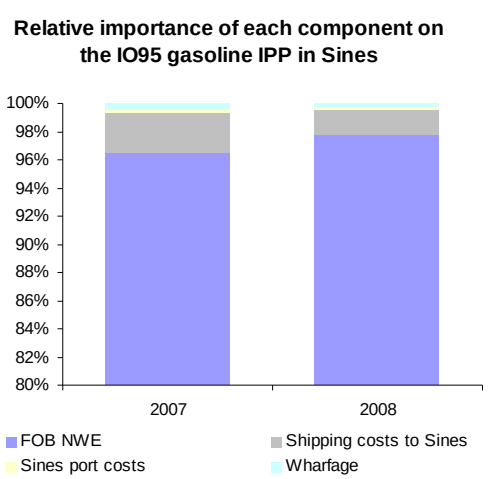
[71] Note that the level of wharfage is higher with refined products than with crude.

482. The third most relevant component was wharfage, which accounted for around 0,45% of the IPP of 95-octane gasoline in 2007 and 0,26% in 2008.

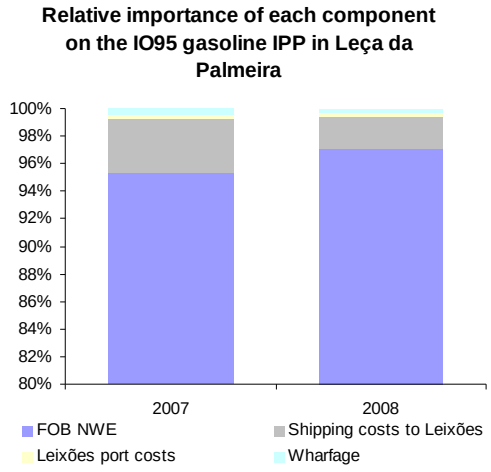
483. As for costs with sea ports, the port of Sines accounted for 0,2% of the IPP of 95-octane gasoline in Sines, and the port of Leixões accounted for 0,3% of the IPP of 95-octane gasoline in Leça da Palmeira.

484. The relative proportion of each of these components in the structure of the IPP of 95-octane gasoline in Sines and in Leça da Palmeira is best illustrated in the charts below.

Chart 35 – Relative proportion of each of the components in the structure of the IPP of 95-octane gasoline in Sines and in Leça da Palmeira in 2007 and 2008



Source: PCA analysis based on Platts; ECB; Galp; Repsol; and BP data.
Note: y-axis begins at 80% in order to improve readness.



Source: PCA analysis based on Platts; ECB; Galp; Repsol; and BP data.
Note: y-axis begins at 80% in order to improve readness. forma a facilitar a

485. In the structure of the IPP of diesel for road use in Sines and in Leça da Palmeira, the component relating to the price of fuel in the market used as a reference (NEW) accounted for more than 97% of the IPP in both places, a figure that is higher than for gasoline.

486. The bigger relative proportion of this component is related with the smaller relative proportion of the cost of maritime transport (including insurance) of diesel for road use.

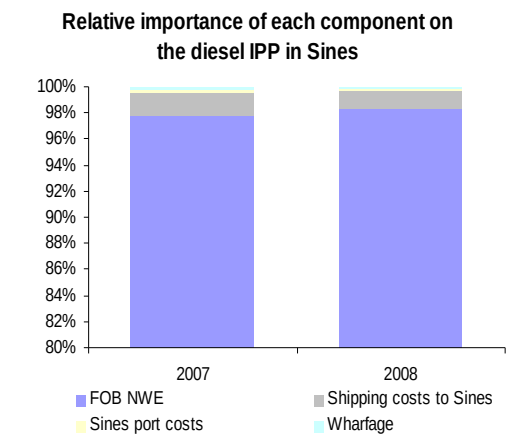
487. Indeed, the cost of freight by sea (including insurance) only accounted for around 1.8% in 2007 and 1.4% in 2008 for the IPP in Sines, and 2.2% in 2007 and 1.6% in 2008 for the IPP in Leça da Palmeira.

488. The third most relevant component was wharfage, which accounted for around 0,21% do IPP of diesel for road use in 2007 and 0,15% in 2008.

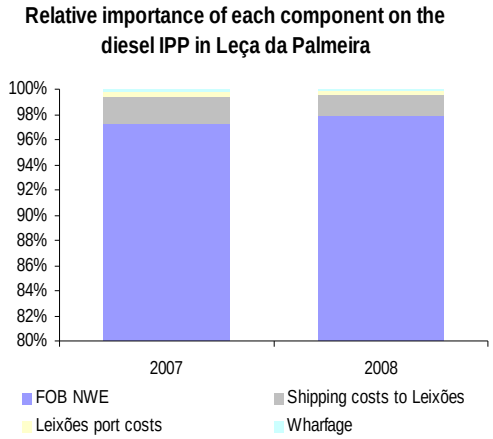
489. As for costs with sea ports, the costs involved at the port of Sines accounted for 0.2% of the IPP of diesel for road use, and the costs involved at the port of Leixões accounted for 0.3%-0.4% of the IPP of diesel for road use in Leça da Palmeira.

490. The relative proportion of each of the components in the structure of the IPP of diesel for road use in Sines and in Leça da Palmeira is best illustrated in the charts below.

Chart 36 – Relative proportion of each of the components in the structure of the IPP of diesel in Sines and in Leça da Palmeira in 2007 and 2008



Source: PCA analysis based on Platts; ECB; Galp; Repsol; and BP data.
Note: y-axis begins at 80% in order to improve readness.



Source: PCA analysis based on Platts; ECB; Galp; Repsol; and BP data.
Note: y-axis begins at 80% in order to improve readness.

6.3.8. Changes in each of the components of the IPP in 2007 and 2008

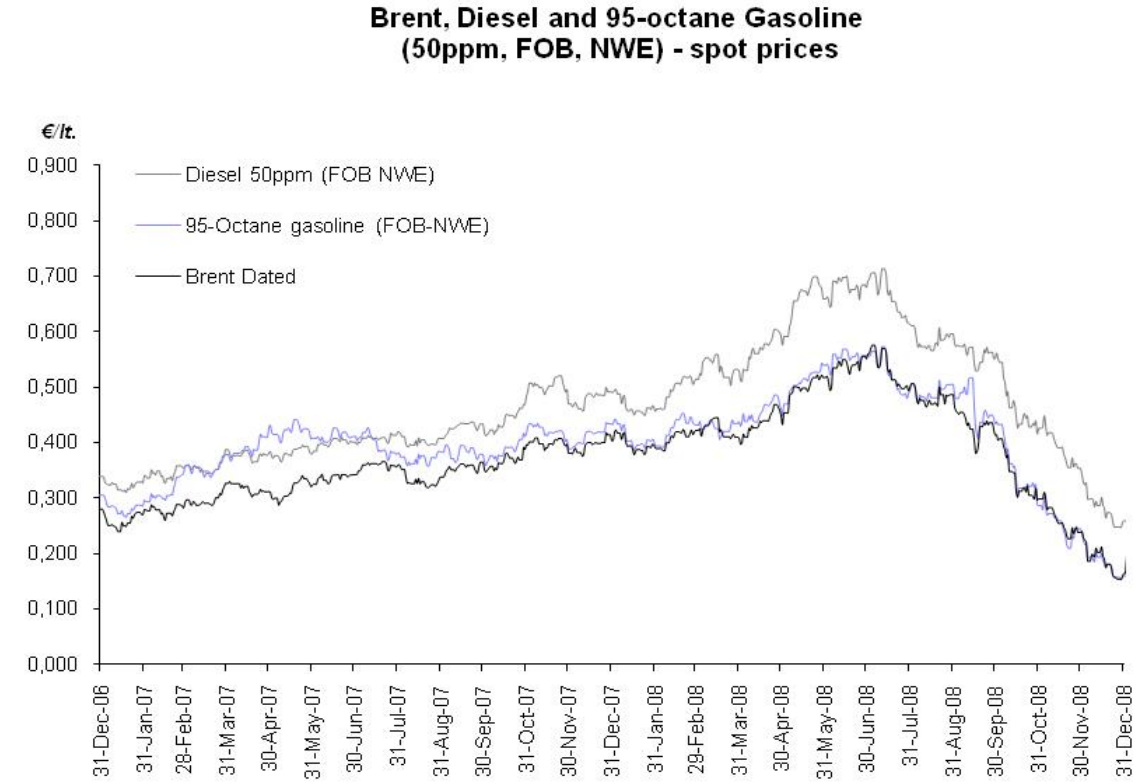
The price of fuel for road use in the market used as a reference (FOB NWE)

491. With crude being the main raw material for the production of gasoline and diesel for road use, the Platts quotations (FOB NWE) for these two products tend in the long term to vary according to the prices of Brent (crude) (this analysis will be set out in more detail in subsection 6.3.1.7).

492. As with crude, therefore, during the whole of 2007 and into the first half of 2008 there was an uninterrupted increase in the price of fuel for road use in the international markets used as a reference.

493. This trend was only inverted during the second half of 2008, with an abrupt fall in the prices and by the end of 2008 they were below the quotations seen at the start of 2007 (as illustrated in the chart below).

Chart 37 – Changes in the spot prices of Brent, diesel for road use (50ppm) and 95-octane gasoline (50ppm), FOB, NWE in 2007 and 2008, in EUR/litre



Source: PCA analysis based on Platts and ECB data.

494. The difference between the lines relating to the prices of fuel for road use and the black line (showing the spot price of crude) is a rough representation of the refining margin or, more specifically of the crack for gasoline and diesel (which is a key component for the refining margin).

495. This issue will be analysed in greater detail in section 6.5. of this chapter.

496. It is, however, possible to see an increase in the differential between the spot price of diesel for road use and with the *Brent* a fall in the differential with the spot price of gasoline in relation to *Brent* (this differential in the case of gasoline reached negative values at some points in 2008).

497. This change in the differentials is related to the increase in the consumption of diesel relative to gasoline, as a result of the move towards diesel in

Europe's cars and the shortfall in refining capacity for diesel in Europe as against the excess capacity for the production of gasoline.

498. In 2008, the average quarterly price of 95-octane gasoline in the international market used as a reference varied in relation to 2007 as shown in the table below.

Table 8 – Bulk prices used as an international reference for 95-octane gasoline (FOB NWE) – €/ltr.

	2007	2008	Change between periods year on year	Change between periods year on year (%)
1st Quarter	0.316	0.420	0.104	33%
2nd Quarter	0.407	0.505	0.098	24%
3rd Quarter	0.383	0.495	0.112	29%
4th Quarter	0.406	0.264	-0.142	-35%
Annual	**0.378**	**0.421**	**0.042**	**11%**
Change from 4Q2007 to1Q2008		0.014		
Change from 1Q2008 to 2Q2008		0.085		
Change from 2Q2008 to 3Q2008		-0.010		
Change from 3Q2008 to 4Q2008		**-0.231**		
Change from 4Q2007 to1Q2008 (%)		4%		
Change from 1Q2008 to 2Q2008 (%)		20%		
Change from 2Q2008 to 3Q2008 (%)		-2%		
Change from 3Q2008 to 4Q2008 (%)		**-47%**		

Source: Analysis by the Portuguese Competition Authority based on data from Platts.

499. In terms of average quarterly prices it can be seen, in year-on-year terms, that in 2008 the average price of 95-octane gasoline in the international markets used as a reference increased in the three first quarters of 2008 and decreased in the fourth quarter of the year.

500. As for diesel for road use, it can be seen that in 2008 the average quarterly price in the international market used as a reference varied relative to 2007 as shown in the table below.

Table 9 – Bulk prices used as an international reference for diesel for road use (FOB NWE) – €/ltr.

	2007	2008	Change between periods year on year	Change between periods year on year (%)
1st Quarter	0.341	0.498	0.157	46%
2nd Quarter	0.386	0.634	0.248	64%
3rd Quarter	0.412	0.604	0.192	47%
4th Quarter	0.473	0.379	-0.094	-20%
Annual	**0.403**	**0.528**	**0.125**	**31%**
Change from 4Q2007 to1Q2008		0.025		
Change from 1Q2008 to 2Q2008		0.136		
Change from 2Q2008 to 3Q2008		-0.030		
Change from 3Q2008 to 4Q2008		**-0.225**		
Change from 4Q2007 to1Q2008 (%)		5%		
Change from 1Q2008 to 2Q2008 (%)		27%		
Change from 2Q2008 to 3Q2008 (%)		-5%		
Change from 3Q2008 to 4Q2008 (%)		**-37%**		

Source: Analysis by the Portuguese Competition Authority based on data from Platts.

501. In terms of average quarterly prices, it can be seen that, by comparison with the same quarter of 2007, in 2008 the average price of diesel for road in the international markets used as a reference increased in the three first quarters of 2008 and decreased in the fourth quarter of the year.

Quality premium

502. In the Portuguese case, as previously mentioned, a quality premium cannot be applied to 95-octane gasoline and diesel for road use to the extent that the Platts quotations refer to product specifications similar to domestic ones.

503. In terms of 98-octane gasoline, the average value for a "quality premium" compared with 95-octane gasoline (10ppm) in the international markets was 25.93 USD/ton in 2007 and 33.76 USD/ton in 2008, corresponding to 1.4 cents/litre and 1.7 cents/litre.[72]

[72] Calculations of the Portuguese Competition Authority based on information from *Platts* (spread between the quotation for specification 98 RON Gasoline 10 ppm FOB ARA and the specification PREMIUM Gasoline 10 ppm Barges FOB ARA).

504. In Portugal, in 2007 and 2008, the implicit quality premium for 98-octane gasoline compared with 95-octane gasoline (10ppm) was between 20 USD/ton and 30 USD/ton, corresponding to a value of between 1 and 1.5 €cts/lt, based on the average exchange rate (USD/EUR) in 2008.

505. This bonus is, therefore, in line with what is observed for gasoline in international transactions.

The costs of maritime transport (freight) and insurance

506. The cost of maritime transport of fuel for road use is the second most relevant variable for determining the IPP, whether for 95-octane gasoline or for diesel, and therefore it is important to analyse changes in these prices for the years under review (2007 and 2008).

507. It is complex to determine changes in the costs of maritime transport of fuel for road use from the point where reference prices are set (NWE) to the ports of Sines and Leixões. There are two reasons for this: in the first place, because there is not much import of fuel for road use in Portugal, with various days for which there is no market reference; in the second place, because most domestic companies, when they do import, they do so on a CIF basis, that is, with the price of freight and insurance included in the final figure to pay.

508. Apart from this, and as an example, for the Port of Sines in the same years there are no imports (or very few) of fuel for road use, and those that are made come from one single company, which makes it difficult to get to a figure for the cost of maritime freight. By the same token, the cost of insurance is even more difficult to gauge.[73]

509. Therefore, bearing in mind:

- That the cost of maritime transport of fuel for road use on the routes NWE-Sines[74] the NWE-Leixões is necessarily indexed to the cost of maritime transport of the main routes to and from NWE (since the companies compete to get the best freight costs);
- That the way prices are reached for prices of maritime transport follows what is commonly called the "*Worldscale rate*";

[73] In order to give extra information on marítime freight between NWE and the port of Sines, there was also included in the calculations the reference of freight between NWE and Lisbon for ships of similar tonnage, bearing in mind the relative proximity of the two ports.

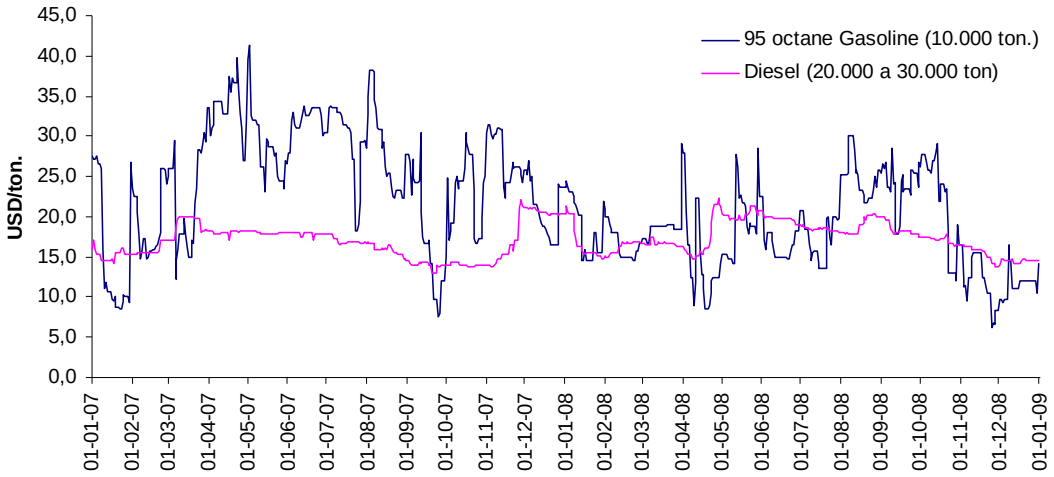
[74] The NWE-Lisbon freight was also used as a proxy.

510. Then, for the purposes of calculating the cost on the NWE-Sines and NWE-Leixões routes, the base point used was the cost of the most frequent routes to and from NWE applying a spread (positive and/or negative depending on the case) which would take in the differences in prices between freight on the NWE-Sines and NWE-Leixões routes borne by the companies importing into Portugal and freight on the main routes to and from NWE.

511. For the purposes of the model developed by the Portuguese Competition Authority, the changes in the price of maritime transport of fuel for road use on the basis of spot on the NWE-Sines the NWE-Leixões routes corresponds to the changes observed for the main NEW routes.

512. These changes are detailed in the chart below:

Chart 38 – Changes in the prices of maritime transport on the most frequent routes in NWE for 95-octane gasoline and for diesel for road use in 2007 and 2008



Source: PCA calculations based on Platts data.
Reference routes: The main routes in the NWE, namely, Hamburg, Bordeaux and North Spain.

513. The quotation for maritime transport of 95-octane gasoline during the 2007 to 2008 period was very volatile (with prices varying between 10 USD/ton and 40 USD/ton), reflecting the smaller relative liquidity of this type of transport on the intra-European routes compared with the transport of diesel (it should be noted that in general Europe has a surplus of gasoline, and therefore the most frequent routes are for dispatching this fuel out of Europe and not between European countries).

514. In spite of the big volatility in the price of maritime transport for 95-octane gasoline, there was from May 2007 a general trend towards a reduction in the price of maritime transport for this fuel on the most frequent routes for NWE.

515. The price of maritime transport for diesel was less volatile in 2007 and 2008, being quoted normally between 15USD/ton and 20USD/ton.[75]

516. During this period there were, generally speaking, two spikes in the cost of maritime transport of diesel for road use, one between the end of November 2007 and mid-January 2008 and the other from mid-May 2008 when the price went over 20 USD/ton.

Costs with seaports

517. The costs below relate to the use of the Sines and Leixões seaports for importing liquid fuels for road use (including all types of direct costs) from 2006 to 2008.[76]

Table 10 – Average costs of port operations for the import of fuel for road use from 2006 to 2008 (in €/m^3)

	2006	2007	9M2008
Diesel			
Sines	0.78	0.85	0.87
Leixões	1.61	1.42	1.45
Gasoline			
Sines	0.69	0.76	0.77
Leixões	1.49	1.31	1.34

Source: BP; Cepsa; Galp; Repsol.
9M2008 – First nine months of 2008. Note that when the request for information was sent, 2008 was not yet closed, so it was not possible to get data for 4Q 2008.

518. The average cost for discharge of fuel for road use in the port of Leixões during 2006 to 2008 was close to double the cost in Sines.

519. In the first 9 months of 2008, the import of diesel through the Port of Leixões meant an additional cost on the product (before tax) of 0.15

[75] The fact that there was less volatility may also be associated with the greater liquidity of market of maritime transport with tankers of bigger dimensions.

[76] Along with these diect costs, there may be other indirect costs associated with port operations (demurrages, for instance). For the purposes of this calculation, these costs were not taken into account,, bearing in mind the difficulty in estimating their residual value.

cents/litre for diesel for road use and 0.13 cents per litre for 95-octane gasoline.

520. In the port of Sines, and for the same period, the additional cost (before tax) was 0.09 cents/litre for diesel for road use and 0.08 cents per litre for 95-octane gasoline.

Costs with wharfage

521. In Portugal, from 2006 to 2008 the percentage of wharfage varied between 0.15% and 0.18% for diesel for road use and between 0.26% and 0.45% for gasoline.

Table 11 – Wharfage associated with import of fuel for road use between 2006 and 2008 (in €/m^3)

	2006	2007	9M2008
Diesel	0.18%	0.21%	0.15%
Gasoline	0.32%	0.45%	0.26%

Source: BP; Cepsa; Galp; Repsol.
9M2008 – First nine months of 2008.

6.3.9. The way ex-refinery prices/cargo of fuel for road use are reached in Portugal

6.3.10. From the IPP to the ex-refinery prices/cargo of fuel for road use in Portugal

522. As previously mentioned in subsection 6.3.1, tendentially, and if there are no barriers to imports, it is likely that the ex-refinery prices/cargo of fuel for road use in Portugal will be similar to those resulting from the formula used for the IPP.

523. The contracts for domestic ex-refinery sales/purchases are evidence of a trend towards using prices near the IPP. This stems from the fact that:

- The ex-refinery prices of 95-octane gasoline, 98-octane gasoline and diesel for road use in Portugal were indexed to the quotations published by Platts for the NWE market;
- The indexation is not made on the basis of CIF quotations for the NWE markets and not FOB. There is a spread applied to these prices, which shows that the differential between the CIF and FOB quotations for NWE is adjusted

by the spreads for an estimate of costs with maritime transport between the NWE region and the ports where the Portuguese refineries are located.

524. Even so, there is no single ex-refinery price. The amount depends on the contracts between the various operators and the domestic refineries with differences in terms of spreads.

525. In spite of this trend towards an approximation of ex-refinery prices[77] to the IPP, the Portuguese Competition Authority analysed to what point these prices in 2007 and 2008 reflected the IPP in Sines and in Leça da Palmeira.

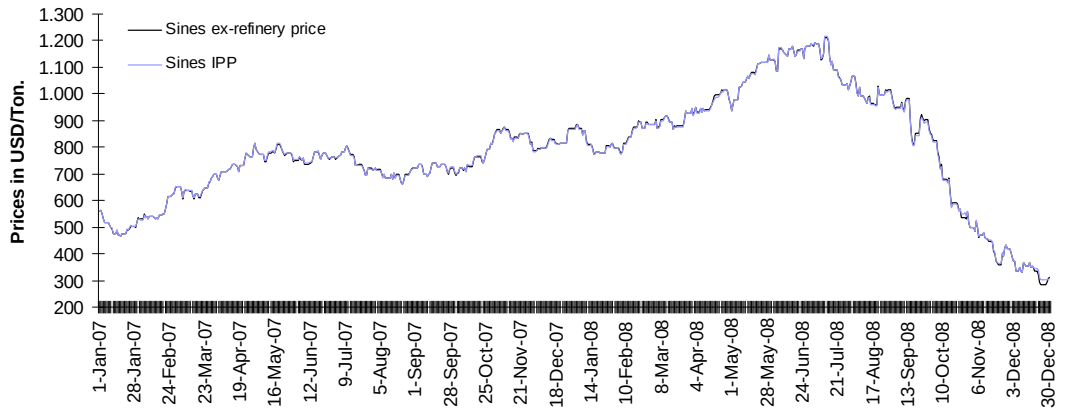
526. For 95-octane gasoline, it can be seen that in 2007 and 2008 the ex-refinery prices charged in Portugal were similar to the IPP.

527. In relation to the prices charged in Sines, the difference was negligible, being one-tenth of a cent per litre less.

528. In relation to the prices charged by the refinery of Leça da Palmeira, it can be seen that on average during 2007 and 2008 the ex-refinery prices were 0.3 cents per litre below the IPP in 2007 and 0.1 cents per litre in 2008.

529. This situation is illustrated in the charts below:

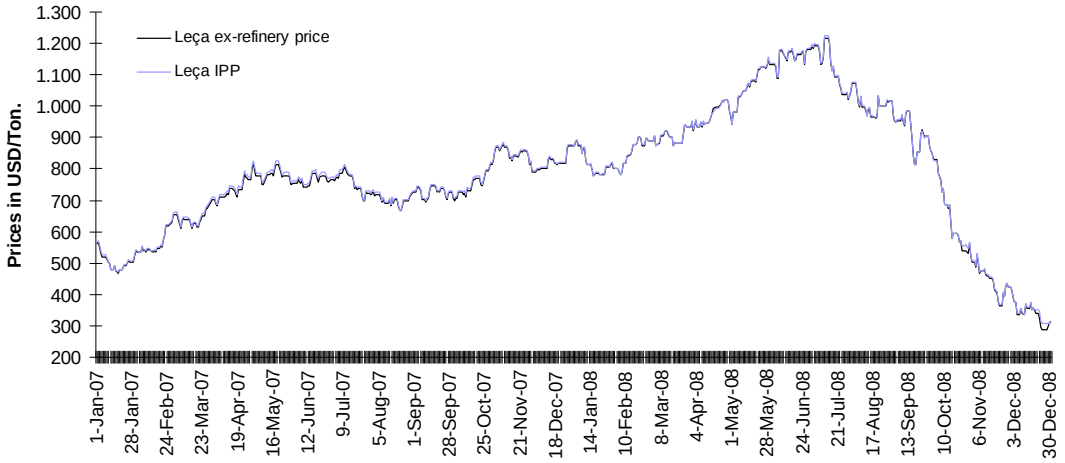
Chart 39 – Comparison between ex-refinery prices of 95-octane gasoline in Sines and the IPP in 2007 and 2008



Source: PCA analysis based on Platts, BCE, Galp, BP, Repsol, Cepsa, Porto de Leixões, Porto de Lisboa and Porto de Sines data.
Notes: y-array was changed to improve readness.

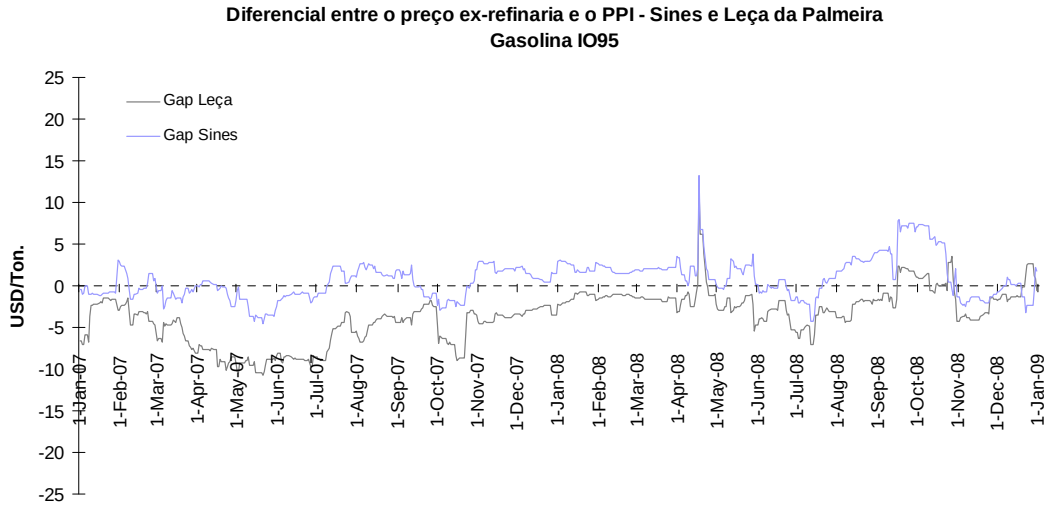
[77] The basis for this was the simple average of ex-refinery price for the operators who purchase products on these terms in Portugal.

Chart 40 – Comparison between ex-refinery prices of 95-octane gasoline in Leça da Palmeira with the IPP in 2007 and 2008



Source: PCA analysis based on Platts, BCE, Galp, BP, Repsol, Cepsa, Porto de Leixões, Porto de Lisboa and Porto de Sines data.
Notes: y-array was changed to improve readness.

Chart 41 – Differential between ex-refinery prices and the IPP of gasoline in Sines and Leça da Palmeira in 2007 and 2008



Source: PCA analysis based on Platts, BCE, Galp, BP, Repsol, Cepsa, Porto de Leixões, Porto de Lisboa and Porto de Sines data.

530. There are various factors that explain why the ex-refinery price of 95-octane gasoline is very close to the IPP and in some cases even below.

531. On one side, the costs of maritime transport for 95-octane gasoline in 2007 and 2008 were higher than those for maritime transport of diesel for road use, as a result of the fact that the tankers most frequently used for the transport of gasoline were smaller (around half or a third) of the tankers

used to transport diesel, as a result of the smaller relative consumption of gasoline.

532. The use of bigger tankers for transport of gasoline may bring down the average price per ton, but it increases the costs of storage, to the extent that more time is needed to clear the fuel and there is more expenditure by the oil companies on risk cover for the price of the product.

533. This element means that the IPP of gasoline, all other things being equal, is higher than for diesel for road use, and this can contribute to the fact that, at any one time, the IPP of gasoline in Portugal may be above that of the ex-refinery price for the same product of gasoline.

534. Moreover, another pertinent factor underlying hid situation stems from the fact that the domestic refineries have a gasoline production surplus for the needs of the domestic market. Such a situation creates additional pressure on the domestic refineries for clearing as big an amount as possible of the product when it is on Portuguese territory.

535. As shown clearly in the results of the analysis presented in subsection 6.2.2, the proportion of gasoline imports for domestic consumption was 6% in 2007 the 7% in 2008, that is, of little significance.

536. The fact that the difference between the ex-refinery price and the IPP of 95-octane gasoline is higher in Sines than in Leixões reflects the differences in the import conditions for third parties in these two ports, whether for questions of access to port infrastructures or to import depots, as analysed in subsection 6.3.2.2.

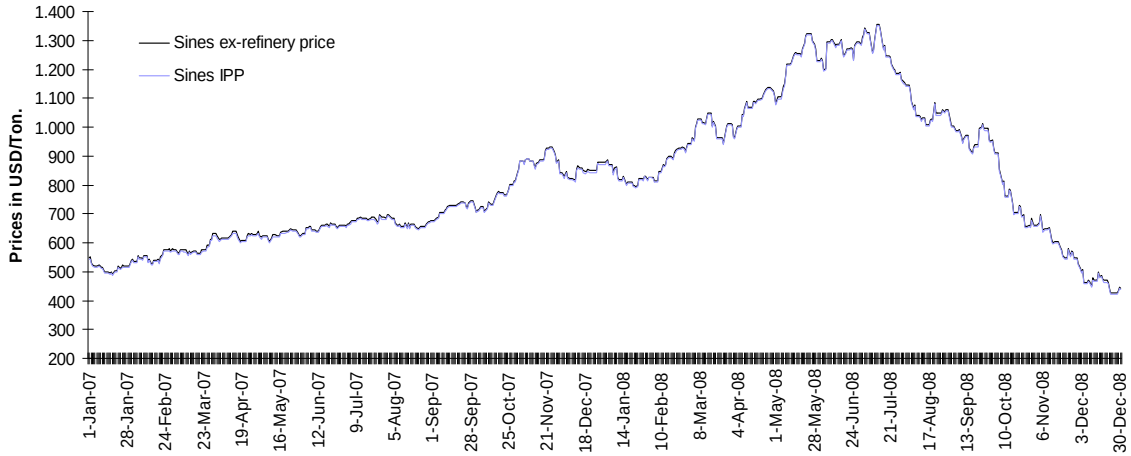
537. In terms of diesel for road use, it can be seen that in 2007 and 2008 the ex-refinery prices charged in Portugal were very close to the IPP.

538. Even so, the ex-refinery prices in Sines and in Leça da Palmeira were, on average, slightly higher than the IPP.

539. In relation to the prices charged in Sines, the difference was equivalent to 0.3 cents/litre and in Leça da Palmeira to 0.2 cents/litre in 2007 and in 2008.

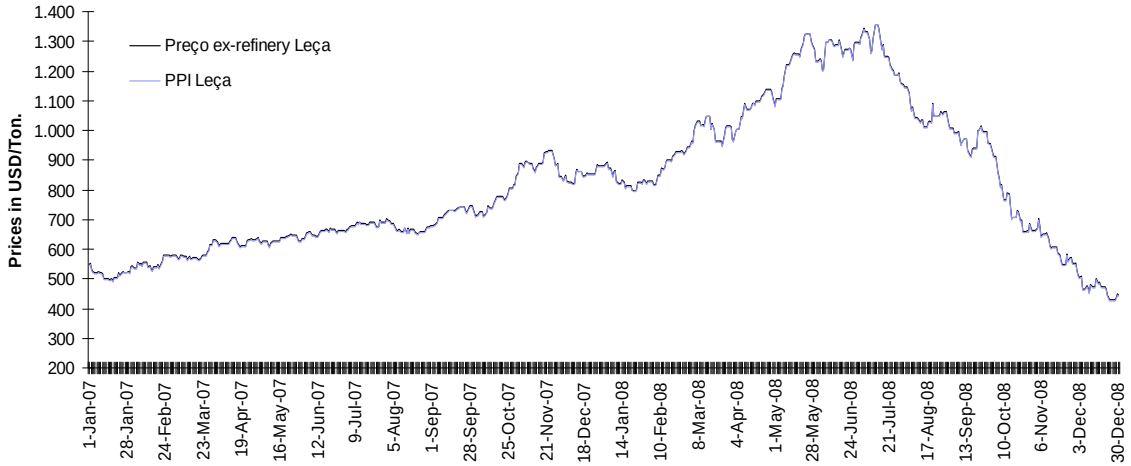
540. This situation is illustrated in the charts below.

Chart 42 – Comparison between ex-refinery prices of diesel for road use in Sines and the IPP in 2007 and 2008 [78]



Source: PCA analysis based on Platts, BCE, Galp, BP, Repsol, Cepsa, Porto de Leixões, Porto de Lisboa and Porto de Sines data.
Notes: y-array was changed to improve readness.

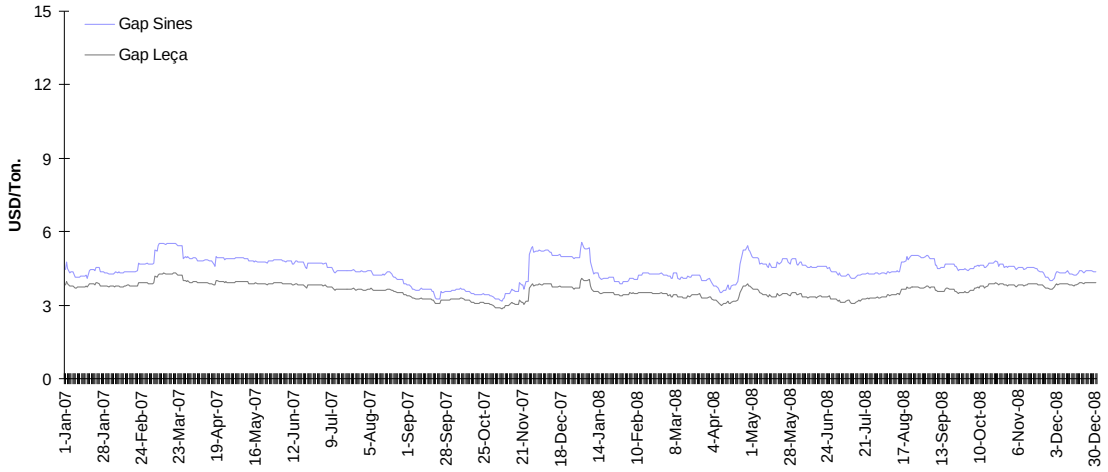
Chart 43 – Comparison between ex-refinery prices of diesel for road use in Leça da Palmeira and the IPP in 2007 and 2008



Source: PCA analysis based on Platts, BCE, Galp, BP, Repsol, Cepsa, Porto de Leixões, Porto de Lisboa and Porto de Sines data.
Notes: y-array was changed to improve readness.

[78] There is less volatility in the differences between Sines and Leça in the case of diesel than gasoline, and this can be explained not only by the smaller relative proportion of cost with maritime transport of diesel for road use (including insurance) than for gasoline – see paragraph 486– but also because there is less volatility in prices of maritime transport of diesel for road use – see paragraphs 513 and following.

Chart 44 – Differential between ex-refinery prices and the IPP of diesel for road use in Sines and Leça da Palmeira in 2007 and 2008



541. In the case of diesel, the logistic elements related to port operations and to the use of storage depots are items that may help explain this situation. They are clear for two reasons:

- One is that the transport of diesel for road use is in larger tankers, creating more demands in terms of the docking points in the ports, and the other is that the discharge of diesel for road use, because of its volume, implies more capacity in the import depots and a relatively rapid dispatch to other depots for secondary distribution;
- Moreover, there is a structural deficit of diesel in Portugal, in the Iberian Peninsula, and in most European countries, meaning that there is more active pressure on logistic elements and there is thus an increase in the comparative advantage of the refineries that are nearer from the consumption centres.

542. In subsection 6.2.2.2 the conditions for import of fuel for road use in Portugal will be analysed in greater detail.

6.3.11. The role of barriers to import in the gap between the IPP and the ex-refinery prices/cargo of fuel for road use in Portugal

6.3.12. Introduction

543. The differentials between the IPP and the ex-refinery prices were in fact low in 2007 and 2008, in particular for diesel for road use, and, bearing this in mind, the Portuguese Competition Authority looked into the problem of barriers to the import of fuel for road use.

544. Importing fuel for road use at a competitive price, in particular diesel for road use, depends on various situations. Among them are:

- The characteristics of the port infrastructures (such as the kind of liquid bulk that can be taken; the maximum admissible draft of a ship; size and depth of the ports and so on);
- The characteristics and conditions for operating fuel depots for road use with connections to the sea ports (among which the existence and ownership of the capacity for receiving and dispatching from the import depots of fuel for road use);
- Contracts that have been made between economic agents for ceding storage capacities that allow for imports;
- The conditions for operating the port infrastructures (such as waiting times).

545. Access to seaports is indispensable for imports of fuel for road use by sea. It is not, however, a condition that is by itself sufficient for such imports through these ports.

546. In the first instance, therefore, the Portuguese Competition Authority analysed all the wharves for discharge in seaports in Portugal so as to assess their characteristics. Among these are the dimensions of the wharves, and the sites for manoeuvering which would enable them to be used, in principle, for the competitive import of diesel for road use.[79] A detailed analysis of all this will be found in subsection 6.3.2.2.2.

547. At a second stage, and as per the analysis detailed in subsection 6.3.2.2.3 the Portuguese Competition Authority assessed each of the wharves

[79] The competitiveness of a cargo of fuel for road use is very closely connected to the total quantity transported.

identified in the analysis mentioned in the paragraph above to see not only the docking facilities for tankers, but whether their outlets were connected to depots which allowed for the competitive import of diesel for road use.

548. At a third stage, in subsection 6.3.2.2.4, for each one of the wharves with conditions for discharge and storage, and constraints on the operation of these wharves, there needed to be an identification of possible operational difficulties that could condition the use of these wharves for the import of fuel for road use.

549. As a last point, and as per the analysis detailed in subsection 6.3.2.2.5, the Portuguese Competition Authority made a brief analysis of the contracts for supply of refined products, storage and logistics operations to assess the way these had an impact on imports of fuel for road use.

6.3.13. Seaports – Analysis of the basic characteristics of the wharves for discharge and conditions for entry into the port

550. The Sistema Portuário Nacional is constituído por five main ports (Leixões, Aveiro, Lisbon, Setúbal and Sines) and four secondary ports (Viana do Castelo, Figueira da Foz, Portimão and Faro).

551. It is important, however, to understand from the start that some ports in the country do not have the infrastructures needed for the import of diesel for road use on competitive terms.

552. In particular and according to most of the economic agents operating in Portugal, the import of diesel on competitive terms implies the use of tankers with a minimum capacity of 20,000 tons and a median capacity of 30,000,

553. At an international level, market surveys undertaken by the European Commission reveal that the prices for transport per unit carried were 35% higher for tankers of 10,000 tons than for large capacity ships (30,000 tons).

554. According to the data gathered by the Portuguese Competition Authority, looking at the main routes for imports of diesel into Portugal, the difference in prices for transport in barges of 10,000 tons and tankers of 30,000 tons was, in some cases, higher than 60% in 2007 and 2008.

555. It follows, therefore, that the ports of Viana do Castelo, Figueira da Foz, Portimão and Faro do not provide a competitive alternative for the import of

diesel for road use because they only allow for the docking of liquid bulk cargo tankers of tonnage significantly less than 20,000 tons.

556. Indeed, this is consistent with the fact that there are imports of diesel for road use through these ports.

557. Even the remaining ports in the country with docking points have major limitations in terms of the type of tankers they can take. It is important to see what these limitations are.

558. In the table below there is a summary of the conditions of various port terminals capable of serving the north of the country for the import of liquid fuels:

Table 12 – Brief description of the sea ports that serve the north of the country in terms of loading / discharge of liquid fuels

	Port of Leixões				**Port of Aveiro**	
Terminal	Terminal Petroleiro de Leixões (TPL)			Terminal Oceânico Galp-Leça (TOGL)	Liquid bulk terminal	
Pier	PA TPL	PB TPL	PC TPL	TOGL	Pier no. 22	Pier no. 26
Organisation that has use of the terminal	Galp Energia (Crudes de Portugal - Petrogal, SA)				Galp Energia (Petrogal, S.A.)	APA, S.A.[80]
Type of liquid bulk capable of being taken at the pier	Diesel	Diesel, Gasoline, Butane, Propane		Crude Oil	Liquid fuels and chemical products	Liquid fuels and chemical products
Maximum size tanker for diesel for road use able to discharge at the pier (kton)	80	30	5	N/A	8	22

Sources: APDL (the Leixões port authority); APA (the Aveiro port authority).

Port of Leixões

559. In the port of Leixões there is a terminal that allows for transport of diesel for road use, commonly known as the Terminal Petroleiro (oil terminal).[81]

[80] The Aveiro port authority (Administração do Porto de Aveiro, S.A.)

[81] Apart from the oil terminal, there are two other terminals for transport of liquid bulk cargo in the port of Leixões: Doca 2 Sul for the private use of Cepsa, which is connected to the storage of bitumen and the company's fuel oil outside the port grounds; the Molhe Sul, for which the

560. The oil terminal at Leixões is connected to the Petrogal refinery, and to the various storage parks for oil-based products which are in the urban district of Matosinhos. Among these, there is one that belongs to BP (for the storage of LPG, gasoline and diesel), one to Repsol (for the storage of LPG, gasoline and diesel), da Cepsa (for the storage of gasoline and diesel) and of Galp (for the storage of LPG, gasoline and diesel).

561. This oil terminal is made up of three wharves for mooring at shoreline and one wharf for mooring at sea, also known as Monobóia.

562. This last is connected to the Porto refinery and only serves for the discharge of crude, in loads of around 80 thousand to 160 thousand tons and therefore is irrelevant for use in the import of diesel for road use.

563. Of the three wharves for mooring at shoreline only two (designated Posto A and Posto B) allowing for the transport of tankers for diesel of around 30 thousand tons.

564. The third wharves for mooring at shoreline (Posto C) is, for this reason, not a viable alternative for the import of diesel for road use.

565. The terminal petroleiro of Leixões is currently under concession to Galp, for public service.[82]

566. In short, there are two docking points in the port of Leixões which, in terms of length, depth of the wharves and leeway for manoeuvre, are capable of taking imports of diesel for road use, with both operated by Galp.

Port of Aveiro

567. According to the Aveiro port authority (APA), there are currently two docking points in the port capable of being used for the import of fuel for road use[83], located in the port's liquid bulk terminal.

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concession is held by EDF&FMAN and is used for transporting molasses and derivatives. It is important to note that these two terminals only allow for the transport of cargoes of less than 5 thousand tons, and this fact, in the light of what has been said above on the competitiveness of imports, means that these two terminals are not competitive for transporting diesel for road use, and this is apart from the fact that they are not connected to large capacity storage depots for imports of diesel for road use.

[82] Under the terms of Decree law no. 298/93, of 28 August, which sets out the legal regime for port operations, the provision of cargo transport services is considered to be of public interest, public service of cargo transport being considered as that which is provided by third parties through a company that is duly licensed for commercial purposes in the grounds of the port.

[83] In the port of Aveiro, the transport of liquid bulk is through the special terminal de Granéis Líquidos. This is cuirrently made up of four docking wharves, three for private use, associated with the storage facilities of their respective operators – Galp, Dow and Cires and one currently for public use. Of these four wharves, only two are capable of taking cargoes of diesel for road use (the

568. The first docking point (designated Posto no. 22), is for private use by Galp and can only take tankers of up to 8.000 tons and therefore is not competitive for the import of diesel for road use.

569. The second docking point (designated Posto no. 26) is a public outlet currently operated by the APA.

570. According to information from the APA, this docking point would have the capacity to allow discharge from tankers of up to 22 thousand tons.

571. However, those using the docking point at the moment have reported that no discharge has been possible in practice from ships of more than 10,000 tons due to recent silting up.

572. Therefore, in 2007 and 2008, and in spite of the fact that in 2008 there were discharges of liquid fuels in small amounts at this wharf, this docking point does not offer an alternative for imports of diesel for road use on competitive terms.

573. Also according to the APA, this situation will be resolved from the 4th quarter of 2009, as a result of the "conclusion of the first stage of the project to improve maritime access to the port of Aveiro, consisting of dredging works outside the breakwater at height -12.5m Z.H.".

574. After conclusion of these works, the APA expects that no. 26 can be used for discharge from ships with a capacity of up to 40 thousand tons.

575. A public tender has been launched for the rights to operate this docking point and the others planned for the future liquid bulk cargo terminal[84] of the port of Aveiro (now in progress).

576. However, the tender for adjudication of this concession is at the stage when proposals are due to be open, but the procedures are currently suspended

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one for Galp's private se and the public one). The other private wharves are used for the transport of bitumen and chemical products. They also have some limiting factors, in terms of access and leeway for manoeuvre, which means that they can only be used by ships with cargoes of less than 5 thousand tons. In other words, fgiven these limitations, the current terminal of liquid bulk cargo of Aveiro would hardly be competitive for the transport of liquid fuels, snd it is not, in point of fact, currently used for the transport of this type of products.

[84] The Aveiro port authority hopes that the concession for operating transport of cargoes in the terminal of liquid bulk cargo as a public service will be awarded by the end of 2009, and it has allocated piers no. 24, no. 25 and no. 26 for this purpose. It is important also to highlight that in this tender, the piers no. 24, no. 25 and no. 26 que, não obstante de no processo de concurso para a adjudicação da exploração das pontes cais n.os 24 a 26 estar previsto a afectação da ponte cais n.° 26 para a transport of oil-based products, existe the possibility of no decurso of prazo da concession, fruto de um aumento in demand for transporting the above-mentioned products, the concessionaire can propose to the Aveiro port authority that ário propor à APA, S.A. a use das piers n.os 24 the 25 be made available for the import of these products if the necessary investment was made.

by judicial order (decreed on 30 September 2008) following an injunction presented by Galp.

577. In short, the port of Aveiro in 2007, 2008 and, as far as can be anticipated, during a large part of 2009, has not been in a position to allow for the import of diesel for road use on competitive terms.

578. However, it is likely that docking point for discharge no. 26 of the port of Aveiro, in terms of length, depth at the wharf and leeway for manoeuvre, could in 2010 become an alternative to the wharf (wharves?) for discharge A and B of the Leixões terminal petroleiro.

579. In the south of the country, maritime transport of liquid fuels use the ports of Sines, Lisbon and Setúbal.

580. In the table below there a summary of the conditions of various port terminals capable of serving the south of the country for imports of liquid fuels:

Table 13 – Brief description of the sea ports that serve the south of the country in terms of loading / discharge of liquid fuels

	Port of Sines					
Terminal	TGLS - Terminal de Granéis Líquidos de Sines – Sines Liquid Bulk Terminal					
Pier	Pier 2	Pier 3	Pier 4	Pier 5	Pier 6	Pier 7
Organisation that has use of the terminal	Galp Energia Group (CLT - Companhia Logística de Terminais Marítimos, S.A.)					
Type of liquid bulk capable of being taken at the pier	Crude, Bunker diesel, Marine Diesel and Bunker fuel	Crude, Fuel, Diesel, Gasolines, Jetfuels, Naphtas, Butane, Propane, Bunker diesel, Marine Diesel and Bunker fuel.			Diesel, Gasolines, Jetfuels, Naphtas, Butane, Propane, Bunker diesel, Marine Diesel and Bunker fuel.	
Maximum size tanker for diesel for road use able to discharge at posto (kton)	Does not handle diesel	135	150	135	5	5

Source: APS (the Sines port authority).

	Port of Lisbon							
Terminal	Liquid bulk cargo terminal - Barreiro	Sea terminal - Porto Brandão	Liquid cargo terminal - Banática		Liquid cargo terminal - Porto Brandão		Liquid cargo terminal - Porto dos Buchos (Trafaria)	
Pier	Liquid bulk cargo - Barreiro		Pier 1	Pier 2	Pier 1	Pier 2	Liquid cargo terminal - Porto dos Buchos (Trafaria)	
Organisation that has use of the terminal	LBC Tanquipor S.A.	LISNAVE – Estaleiros Navais, S.A. (ETC)	Repsol (REPSOL Portuguesa, S.A.)		Galp Energia (Crudes de Portugal - PETROGAL, S.A.)		Galp Energia (ex- ESSO PORTUGUESA, S.A.)	
Liquid bulk cargo capable of being taken at the pier	Diesel, Fuel, Gasoline, Acrylonitrile, Ammonia, Dop, Vinil	Fuel and diesel	Fuel, Diesel, Butane and Propane, Bitumen, Mineral Oils		Diesel, Biodiesel		Diesel	Diesel Butane and Propane Mineral Oil
Maximum size tanker for diesel for road use able to discharge at pier (kton)	24	40	26		26	30[85]	3[86]	20

Source: APL (the Lisbon port authority) and concessionaires.

	Port of Setúbal	
Terminal	Tanquisado	Praias do Sado
Pier	Tanquisado	Pipeline of the Praias do Sado
Organisation that has use of the terminal	Galp Energia (Tanquisado)	EDP Production (Sociedade Pirites Alentejanas, Somincor - Sociedade Mineira de Neves Corvo)
Liquid bulk cargo capable of being taken at the pier	Liquid fuel (according to the contract giving concession for private use)	In the case liquid bulk, only fuel oil (for the EDP power station - for private use).
Maximum size tanker for diesel for road use able to discharge at posto (kton)	23	23

Source: APSS (the Setúbal and Sesimbra port authority) and the concessionaires.

[85] The concessionaire gave the specific tonnage. However the port authority gave a different tonnage, to the value of 18.

[86] The concessionaire gave the specific tonnage. However the port authority gave a different tonnage, to the value of 18.

Port of Sines

581. There are two terminals in Sines where granéis líquidos are transported: the TGLS, which takes types of crude, fuel (fuel oil, gasoline, diesel, LPG), asphalt, bitumen and chemical products and the petrochemical terminal (Terminal Petroquímico de Sines), which is used for transporting chemical products.

582. The petrochemical terminal at Sines is under concession to Repsol, and provides a back-up service for the petrochemical complex that the company has. According to information from Repsol and the APS (the Sines port authority), this terminal cannot take liquid fuels, since there are no facilities for docking tankers.

583. So, in Sines there is only one terminal that could be used for the import of diesel and gasoline for road use: the TGLS – Terminal de Granéis Líquidos de Sines.

584. In this terminal, piers 3, 4 and 5 have the necessary conditions, in terms of length, depth at the wharf and leeway for manoeuvre, to take the import of diesel for road use on competitive terms.

585. The remaining docking points, either do not have the size needed to take tankers of around 30,000 tons (as is the case of docking points 6 and 7) or not are structured to take diesel for road use (point 2).

586. The TGLS – Terminal de Granéis Líquidos de Sines is under concession to Galp for public service.[87]

587. In short, there are three docking points in the port of Sines which, in terms of length, depth at the wharf and leeway for manoeuvre, would allow for imports of diesel on competitive terms, all under concession to Galp.

Port of Lisbon

588. According to the Lisbon port authorities, there are 5 terminals[88] capable of allowing for the transport of liquid bulk cargo and, more specifically, liquid fuels for road use:

- The liquid bulk terminal in Barreiro;

[87] This concept was defined in footnote 82 above.

[88] There is also the terminal for liquids of Portinho da Costa. However, this terminal is a wharf that is for military use, and it is run by the Portuguese navy, and it handles diesel, and is associated with NATO' storage facilities, normally used for purposes of mandatory strategic reserves, and was therefore not considered for this analysis.

- The maritime terminal at Porto Brandão;
- The terminal for liquids at Banática;
- The terminal for liquids at Porto Brandão;
- The terminal for liquids at Porto de Buchos (Trafaria).

589. The terminal for liquid bulk in Barreiro has a docking wharf and takes liquid and gas products from crude (fuel oil, diesel, and gasoline) and products related with the chemical and food and beverage industries. This terminal has been under concession for public service to LBC/Tanquipor[89] for a number of decades, and is being used by clients of the LBC.

590. The terminal has a capacity to take tankers of up to 22 thousand tons and therefore is n just about competitive for the import of diesel for road use. Even so, it must not be ignored in an analysis of wharves with potential for discharge of diesel for road use that is imported to sites which have at least a minimum competitive edge.

591. The maritime terminal of Porto Brandão allows for discharge from tankers of more than 30,000 tons of diesel for road use and therefore, in terms of this characteristic, is an alternative for imports of diesel for road use. It is currently under concession to LISNAVE – Estaleiros Navais, S.A. (and sub-conceded to the ETC[90]) for private use.

592. The Banática terminal for liquids has two wharves for discharge and is used by Repsol, for private purposes, through a licence that is renewed annually. The terminal is used for transporting fuel oil, gasoline, LPG and bitumen. It can be used for discharge from tankers up to 26 thousand tons loaded with diesel for road use.

593. So, this terminal is just about competitive for the import of diesel for road use and must not be ignored in an analysis of wharves with potential for discharge of diesel for road use that is imported to sites which have at least a minimum competitive edge.

594. The terminal for liquids in Porto Brandão has two docking points, although only one of them has the capacity to take tankers of up to 30 thousand tons.

89 LBC/Tanquipor is a company with headquarters in Barreiro. It provides services in operations involving the running of storage terminals and transport of liquids or bulk liquefied gas. LBC/Tanquipor is part of the international group LBC Tank Terminals, which has storage infrastructures in Europe and in the USA.

90 ETC-Terminais Marítimos, S.A. is a company with head office in Portugal, in Porto Brandão, Caparica.

For this reason, it is the only one of the two, in terms of length, depth at the wharf and leeway for manoeuvre that would allow for the import of diesel for road use on competitive terms.

595. This terminal is used by Galp on a private basis, through a licence which is renewed annually.

596. As a last point, the terminal for liquids in Porto de Buchos have a wharf for discharge used habitually for the transport and storage of gasoline, diesel and LPG.

597. This terminal has a capacity to take tankers of up to 20 thousand tons and is therefore at the minimum competitive threshold for the import of diesel for road use, and therefore must not be ignored in an analysis of wharves with the potential to discharge diesel for road use imported on competitive terms.

598. Previously operated by Esso, on an annual licence, it is currently operated by Galp as a result of its acquisition of the operations from Exxon Mobil in Portugal. However, its running should be ceded to third parties as a result of the measures imposed by the European Commission when it gave approval for the acquisition.

599. In short, there are six docking wharves in the port of Lisbon with the necessary conditions, in terms of length, depth at the wharf and leeway for manoeuvre, for the import of diesel for road use on competitive terms. Two of these wharves are used by Galp, two by Repsol, um by the LBC and the others by the ETC.[91]

Port of Setúbal

600. According to the Setúbal and Sesimbra port authority (APSS), there are two[92] terminals in the port of Setúbal that could be used for the discharge of liquid fuels:

- the Tanquisado terminal, and
- the Praias do Sado terminal.

[91] The LBC and the ETC have tanks capable of storage of fuel for road use. They are rented to Galp, Cepsa, and BP.

[92] There is also a third terminal for liquid bulk where the concession is held by Sapec, but it only handles chemical products and not fuel for road use.

601. The Tanquisado terminal of is used by Galp for fuel oil, gasoline and diesel for private use (through the Tanquisado company), and has docking points for 800-ton tankers.

602. The Praias do Sado terminal is for the private use of EDP and is exclusively used by this company for the transport of fuel oil to its power station nearby. According to EDP, it is not set up to receive ships carrying diesel for road use.

603. In short, in the port of Setúbal there is a wharf for docking (in the private terminal belonging to Galp) and this has the right set up for the import of diesel for road use on competitive terms, in terms of length, depth at the wharf and leeway for manoeuvre.

Summary

604. In short, if we are looking only at length, depth of wharves and leeway for manoeuvre, there were two wharves in the north of Portugal capable of taking discharges of diesel for road use from tankers of competitive size in 2007 and 2008.

605. These two outlets are in the liquid bulk terminal of the port of Leixões and are subject to concession to Galp for public service, beyond 2030.

606. According to the APA, it is likely that from 2010 there will be a third outlet with these characteristics in the port of Aveiro.

607. The table below sums up this situation.

Table 14 – Summary of the docking points in the country's ports in 2007 and 2008 which, as regards the length of the wharves, depth and the leeway for tanker manoeuvre, would be able to take imports of diesel for road use for the north of the country, with at least a minimum of competitive advantage

Port	Terminal	Pier	Concessionaire	Maximum size of tanker that could be discharged
Leixões	Leixões	PA TPL	Galp Energia Group	80,000 Tons
Leixões	Leixões	PB TPL	Galp Energia Group	30,000 Tons
TOTAL in the north: 2 Outlets				

Source: APDL.

608. In the south of Portugal, looking only at the length and depth of the wharves and leeway for tanker manoeuvres in 2007 and 2008 there were ten wharves of competitive size capable of taking discharges of diesel from tankers of competitive size.

609. Three of these outlets are in the port of Sines and are under concession to Galp, and one is in the port of Setúbal and is also under concession to Galp.

610. The remaining six docking points are in the port of Lisbon, with two under concession to Galp, two to Repsol, one to the LBC group and the remainder to the ETC group.

611. The table below sums up this situation:

Table 15 – Summary of the docking points in the country's ports in 2007 and 2008, which, as regards the length of the wharves, depth and the conditions for tanker manoeuvre, would be able to take imports of diesel for road use for the south of the country, with at least a minimum of competitive

Port	Terminal	Outlet	Concessionaire	maximum size de tanker that could off load
Sines	TGLS – Sines liquid bulk terminal	Pier 3	Galp Energia	135,000 Tons
Sines	TGLS – Sines liquid bulk terminal	Pier 4	Galp Energia	150,000 Tons
Sines	TGLS – Sines liquid bulk terminal	Pier 5	Galp Energia	135,000 Tons
Setúbal	Tanquisado	Single	Galp Energia	23.000 Tons
Lisbon	The terminal for liquids at Porto Brandão	Pier 1	Galp Energia	30,000 Tons
Lisbon	The terminal for liquids at Porto dos Buchos (Trafaria)	Single	Galp Energia	20,000 Tons
Lisbon	The terminal for liquids at Banática	Pier 1	Repsol	26.000 Tons
Lisbon	The terminal for liquids at Banática	Pier 2	Repsol	26.000 Tons
Lisbon	Liquid bulk terminal at Barreiro	Single	LBC	24.000 Tons
Lisbon	The terminal for liquids at Porto Brandão	Single	ETC	40,000 Tons
TOTAL in the south: 10 Outlets				

Source: APS, APSS, APL.

6.3.14. Import depots

612. When identification has been made of the wharves in Portugal's sea ports which have the characteristics needed in principle for discharge in terms of the size and leeway for tanker manoeuvre, it is important then to assess whether, apart from docking conditions for tankers, these outlets are connected to storage depots which can handle imports of diesel for road use on competitive terms.

613. Import depots can be defined as places which can handle large ships (from 30,000 tons to 50,000 tons), that is, they can take loads (of imported products) transported in large volume.

614. These depots allow for storage of all the liquid fuels that are connected by pipeline to seaports.

615. Import depots have features that are different from other types of depot, such as coastal depots and distribution.

616. Indeed, although import depots can take supplies for service stations nearby, like coastal and other distribution depots, they have the means to take imports of fuel from large and economically competitive ships, unlike the other depots.

617. For those operators who are looking to import fuel for road use, only the import depots are relevant, to the extent that, even though the rental prices may be high compared with the price of renting other depots, their only option is to use these depots. The fact is that a lack of access to means of transport that can take large volume is a limitation on substituting these depots by others.

618. For these reasons, there is deemed to be no possibility of substitution between import depots connected to means of transport of large volume (ships of between 30,000 and 50,000 tons) and other fuel storage depots.[93]

619. So an assessment will be made of the import depots connected to each of the outlets for the northern and southern parts of the country identified in the previous subsection.

In the north

620. From the analysis in the previous chapter, it can be seen that in the north of the country in 2007 and 2008, there existed two docking points in the port of Leixões capable of being used for fuel imports bearing in mind the conditions provided for the ships used.

621. These outlets are connected by pipeline to depots capable of fuel storage in the refinery of Leça da Palmeira (belonging to Galp), to Parque do Real (where there are depots belonging to Repsol, Galp and BP) and the storage area belonging to Cepsa in Matosinhos Norte.

[93] See also the European Commission decision in case COMP/M.1628 – TotalFina/Elf of 09.02.2000,

622. However, not all of these depots have the characteristics needed for competitive import. BP has in Parque do Real a usable capacity[94] for deposits of less than 10,000 m^3, and therefore it is not in a position de take ships for the import of diesel on competitive terms. This demands bigger volumes for sufficient reduction in the relevant unit costs.

623. The companies with potential for competitive imports of diesel for road use in the north of the country in 2007 and 2008 were Galp, Repsol and Cepsa (see the table below).

624. The import potential of the companies in 2007 and 2008 was considerably asymmetric, with Galp holding [55%-60%] of the import depots, Repsol [20%-25%] and Cepsa [15%-20%], as shown in the table below.

Table 16 – Summary of the usable capacity (in m^3) of the import depots of fuel for road use in the north of the country in 2008 and an estimate for 2010

	2008		**2010 (Estimate of the Portuguese Competition Authority)**	
Port of Leixões				
Galp	[120,000-130,000]	[55%-60%]	[120,000-130,000]	[40%-45%]
Repsol	[50,000-60,000]	[20%-25%]	[50,000-60,000]	[15%-20%]
Cepsa	[40,000-50,000]	[15%-20%]	[40,000-50,000]	[10%-15%]
Port of Aveiro				
Martifer	0	0%	[70,000-80,000]	[20%-25%]
Agregado	**[210,000-220,000]**	100%	**[290,000-300,000]**	100%

Source: Companies.

625. If the scheme to improve the port of Aveiro materialises, and pier 26 can be used for the competitive import of diesel for road use in 2010, then the storage depots belonging to the Martifer group and connected by pipeline to this outlet can function as import depots.

626. These expected changes in the port infrastructures will lead to a reduction in dependence on the port of Leixões for imports and will allow other operators access to import depots.

627. It should be noted that the Martifer depots in Aveiro are currently mainly used by BP, the idea being to reduce over time the logistic shortfalls that

[94] Usable capacity equals the maximum capacity minus unrecoverable residue.

mean there is no chance for the competitive import of diesel for road use for the north of the country.

628. In short, in the north of the country, in 2007 and 2008, the conditioning factors with these ports and with the storage depots meant that only two companies, Repsol and Cepsa (apart from the Leça da Palmeira refinery) had any potential for imports of fuel for road use. This situation is likely to stay unchanged in 2009 and from 2010, BP (through the depots belonging to Martifer and in the port of Aveiro) may also be in a position to import diesel for road use competitively.

629. It will be important to check if this import potential can be used in a suitable way, bearing in mind the contracts and the operating conditions of the only two wharves capable of being used for discharge (an analysis of this point will be found in subsection 6.3.2.2.4).

In the south

630. As seen in the previous subsection, there are 3 outlets in the port of Sines with potential for imports of fuel for road use.

631. The only storage depots connected by pipeline to these three outlets are the depots of the Sines refinery.[95]

632. There are import depots that could be used for the competitive import of diesel for road use, bearing in mind the unique characteristics of the port of Sines, which can discharge from ships of between 30,000 and 135,000 m^3, and the unique characteristics of the import depots (com a usable aggregate capacity of more than 350,000 tons). They belong to Galp.

633. So as things stand, only an agreement with Galp would allow for the import of diesel for road use by third parties through the port of Sines.

634. In the port of Setúbal, there is only one wharf for discharge which, as analysed in the previous subsection, could be used for the import of fuel for road use, and it is connected by pipeline to import depots with a usable capacity of [40,000-50,000 m^3], so it could be used for the competitive import of diesel for road use.

[95] None of the other storage depots in or near the port of Sines, according to their owners (Carbogal, Repsol, Euroresinas), could store fuel for road use. They are all for chemical products and other composites with very specific storage characteristics and they are not connected by pipeline to any wharf.

635. The terminal in the port of Setúbal where this wharf is if for private use under concession to Galp. The import depots are held by Galp.

636. Apart from Galp, no other economic group would seem to be in a position to import fuel for road use through the port of Setúbal on competitive terms.[96]

637. As for the Port of Lisbon, in the previous subsection 6 outlets were identified (in 5 terminals) which are potentially usable for the import of diesel for road use. It is a matter now of checking whether they have import depots that would make imports possible.

638. The Banática terminal for liquids is under concession to Repsol, and in spite of there being two wharves for discharge with potential for receiving imports (point 1 and point 2), this terminal does not have import depots (with com capacities between 30,000 and 50,000 tons). There is only one cluster of coastal depots connected to the port with joint usability of less than 25,000 tons.

639. In addition, according to the concessionaire of the terminal, the owner of the depots, Repsol, it is not possible to enlarge the storage park because of issues related to land use and the environment.

640. Therefore, in spite of the fact that the Banática terminal would allow for the import of fuel for road use, it does not seem that it could do so competitively.

641. There is another terminal in the port of Lisbon with major restrictions, and these make it impossible for its use for the competitive import of diesel for road use and that is the terminal at Porto Brandão, operated by the ETC.

642. In spite of the fact that there exists in this terminal a usable storage capacity, belonging to the same company, of [50,000-55,000] m^3, there are difficulties in subsequently dispatching of the products tanker trucks to the places of consumption.

643. According to the ETC, there is only one point of access for the terminal exits overland (the Porto Brandão road), and this has a transport limit of 10 tanker trucks per day, in other words 300 m^3 per working day.

644. This situation implies that a ship transporting 30,000 m^3 would need 100 working days to be totally discharged into the outlets. This comes to around

[96] The EDP company has storage depots in this area, but they are for storing fuel oil for the power station nearby and are used permanently for these operations.

four months. This makes it impossible to ensure competitive imports of diesel for road use.

645. For this reason, the depots in this terminal belonging to the ETC cannot be used as import depot, so there are only coastal depots, with potential interest from the point of view of fuel for road use, for setting up strategic reserves.

646. On top of all this, the majority of ETC depots are currently being used by Galp.

647. The liquid bulk terminal at Porto de Buchos is operated by Galp, and could be turned to competitive advantage for the import of diesel for road use, bearing in mind the characteristics of its only wharf (as analysed in the previous subsection), which is connected by pipeline to import depots belonging to Galp with a total usable capacity of [40,000-50,000] m^3.

648. These import depots for fuel for road use belong to Galp as a result of the acquisition of the operations da Exxon Mobil in Portugal, carried out in 2008. Following measures imposed by the European Commission for the approval of this operation of concentration Galp must hive off these facilities.

649. The terminal for liquids at Porto Brandão is operated by Galp and could in principle be turned to competitive advantage for the import of diesel for road use, bearing in mind the characteristics of its only wharf (as analysed in the previous subsection), and the fact that it is connected by pipeline to depots belonging to Galp with a total usable capacity of [115,000-130,000] m^3.

650. However, as with the ETC terminal, located nearby, so in this case the exits from the terminal overland allow for only a maximum of 10 tanker trucks per day (due to restrictions imposed b the local Town Hall), and this means that this terminal cannot be used for competitive import of fuel.

651. As a last point, the liquid bulk terminal at Barreiro could be used for competitive import of diesel for road use bearing in mind the characteristics of its only wharf (as analysed in the previous subsection), which is connected by pipeline to import depots belonging to the LBC and CUF group (with a total usable capacity of [100,000-120,000] m^3).

652. These import depots are currently being used by Cepsa, BP and Galp.

653. In short, in the south of the country, in 2007 and 2008, the conditioning factors with these ports and with the storage depots of the ten docking

points de ships initially identified as having any potential for competitive imports of diesel for road use, bearing in mind their characteristics, in only six are there import depots and of these six, only one (the liquid bulk terminal at Barreiro), is connected by pipeline to storage depots that do not belong to Galp.

654. Therefore, in the south, there is only one docking point, in the terminal de graneis líquidos do Barreiro, through which it is possible currently for other operators than Galp to import diesel for road use in a way that gives at least a minimum competitive edge.

655. At the end of 2008, Galp owned [75%-80%] of the usable capacity of import depots existing in the south of the country.

Table 17 – Summary of the usable capacity (in m^3) of the import depots of fuel for road use in the south of the country, in 2008, and an estimate for 2010

	2008		2010 (Estimated)	
Port of Sines				
Galp	[350,000-360,000]	[60%-65%]	[350,000-360,000]	[60%-65%]
Port of Setúbal				
Galp	[40,000-50,000]	[5%-10%]	[40,000-50,000]	[5%-10%]
Port of Lisbon				
Galp	[40,000-50,000]	[5%-10%]	[0-10,000]	[0%-5%]
LBC (includes CUF)	[110,000-120,000]	[20%-25%]	[110,000-120,000]	[20%-25%]
Other	0	0%	[40,000-50,000]	[5%-10%]
Aggregate	[560,000-570,000]	100%	[560,000-570,000]	100%
Galp	[440,000-450,000]	[75%-80%]	[395,000-405,000]	[70%-75%]
LBC (includes CUF)	[110,000-120,000]	[20%-25%]	[110,000-120,000]	[20%-25%]
Others	0	0%	[40,000-50,000]	[5%-10%]

Source: Operators.

656. In the medium term, this situation can only undergo a minor change as a result of the Galp having perforce to dispose of the depots that it holds in the liquid bulk terminal at Porto de Buchos, as a result of the measures imposed by the European Commission following its acquisition of the operations of Esso in Portugal.

657. Even so, after this disposal, Galp will continue to hold [70%-75%] of the import depot capacity in the south of the country.

658. In practice, only two companies, Cepsa and BP (apart from Galp), had any potential for importing fuel in the south, even though with capacities clearly different from Galp, as shown in the table below.

Table 18 – Distribution of the usable capacity of import depots existing in the south in terms of the user (in m^3)

	2008		**2010 (Estimated)**	
Galp	[460,000-470,000]	[80%-85%]	[410,000-420,000]	[70%-75%]
BP	[60,000-70,000]	[10%-15%]	[60,000 – 70,000]	[10%-15%]
Cepsa	[30,000-40,000]	[5%-10%]	[30,000-40,000]	[5%-10%]
Other	0	0%	[40,000-50,000]	[5%-10%]
Aggregate	[560,000-570,000]	100%	[560,000-570,000]	100%

Source: Companies.

659. Galp held [80%-85%] of usable capacity in the import depots in the south in 2008.

660. Even considering the disinvestment this company is obliged to make, estimates are that in the medium term its capacity will stay at around [70%-75%].

661. For those places that simultaneously meet the conditions in terms of the physical characteristics of the seaport terminals and of the import depots, it is important then to check that the contracts and the operating conditions for the ports allow for competitive imports of diesel for road use (see subsection 6.3.2.2.4 for this analysis).

6.3.15. Analysis of the operating conditions at the wharves for discharge and for loading sufficient cargoes of diesel for road use

662. As a result of the analyses made in subsections 6.3.2.2.2 and 6.3.2.2.3, it can be seen that the following wharves for ships are those that have both the physical characteristics allowing for the handling of ships with adequate

size and are connected to import depots which allow for imports of diesel for road use by sea on competitive circumstances are the following:

Table 19 – Sea ports which allow for imports by sea because they have both the physical characteristics that allow for the handling of ships with minimum competitive size and are also connected by pipeline to import depots

Zone	Sea port	Terminal	Point	Concessionaire	maximum tanker size
Northern zone	Leixões	Leixões	PA TPL	Galp Energia	80,000 Tons
	Leixões	Leixões	PB TPL	Galp Energia	30,000 Tons
Southern zone	Sines	TGLS – Terminal de Granéis Líquidos of Sines	Posto 3	Galp Energia	135,000 Tons
	Sines	TGLS – Terminal de Granéis Líquidos of Sines	Posto 4	Galp Energia	150,000 Tons
	Sines	TGLS – Terminal de Granéis Líquidos of Sines	Posto 5	Galp Energia	135,000 Tons
	Setúbal	Tanquisado	Único	Galp Energia	23.000 Tons
	Lisbon	Porto de Buchos (Trafaria)	Único	Galp Energia	20,000 Tons
	Lisbon	Terminal de granéis líquidos of Barreiro	Único	LBC	24.000 Tons

Source: APDL, APS, APSS, APL.

663. It is important at this point to understand the operating conditions for the discharge of a relevant amount of diesel for road use at each of the docking points mentioned above.

664. To this end, the Portuguese Competition Authority checked on the possible existence of congestion at the wharves and the impact of such congestion in the costs for the users of the port. The following points were assessed:

- The availability of the docking points;
- The effective rate of use of the docking points;
- The number of ships with cargoes of fuel for road use that paid demurrages.

665. Generally speaking, and with one single exception, it can be seen that the docking points under review had good levels of availability.

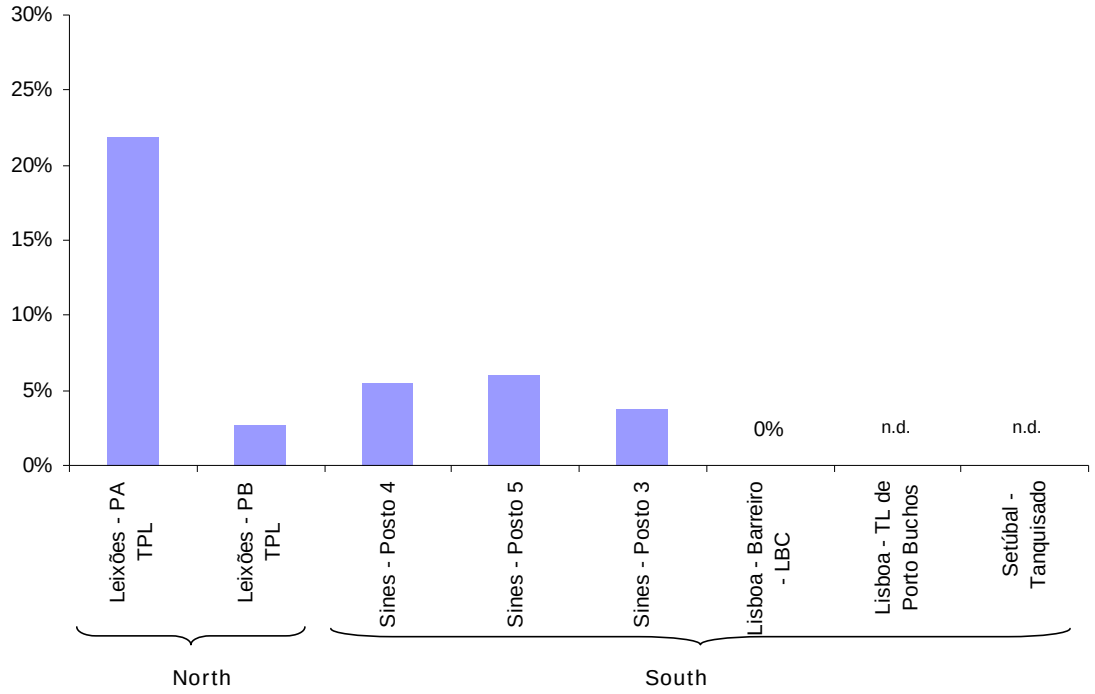
666. Indeed, most of the docking points were available around 95% of the time, that is, the out-of-service rate was around 5% in 2007[97] (as can be confirmed from the chart below).

667. There is, however, an exception, in particular the pier PA at Leixões TPL, which was closed for more than 20% of the days in 2007 (during the first nine months of 2008 the out-of-service rate for this point was 43%), which meant on average more than one day per week.

668. This situation clearly limits the operating capacity of the pier, generating uncertainty in terms of the planning of arrivals and departures and with a potential point of bottlenecks, in particular in periods of bad weather.

669. This situation has an impact, as we shall see further on, not only relating to the operation of this outlet but also to the other outlet that provides an alternative to this one, to the extent that it means a change in the planning of arrivals and departures in the other outlet as well.

Chart 45 – Percentage of days when the docking point was out of use in 2007



Source: Portuguese Competition Authority analysis based on data from the port authorities and concessionaires.

[97] The data for the fourth quarter of 2008 are not yet available. However, this analysis would not differ substantially if the information for the first nine months is taken, given that the data is very similar to the same period in 2007.

670. Once the availability of each of the piers has been checked, it is important to find out its level of congestion, in particular for those that have higher availability indices.

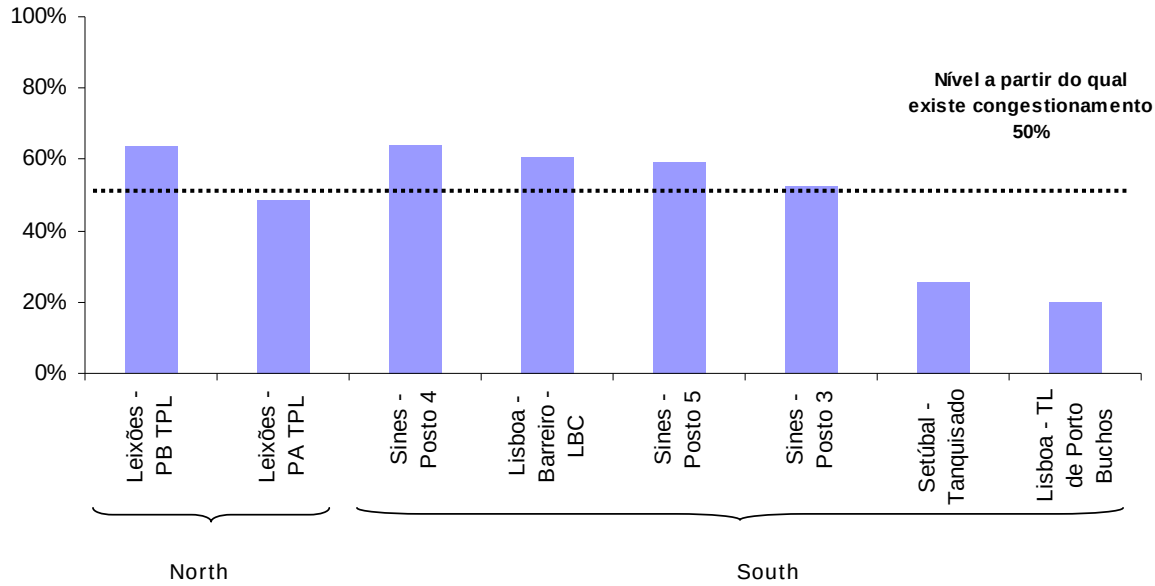
671. According to sectoral data used by the European Commission for its decisions in this field, an import depot is taken to be saturated when its docking point is used more than 50% of the time.

672. During 2007, and relative to the docking points under review, there were congestion levels at the pier PB of the port of Leixões, in all the outlets in Sines and in the pier TGL at Barreiro of the port of Lisbon.

673. The PA terminal of Leixões had, as we have seen already, lower availability rates and was very close to what is considered congestion, with the level of greatest congestion having been observed in pier PB in this same port.

674. As for the other docking points, the only ones with no congestion were those in Tanquisado in Setúbal and those of the TL of the port of Buchos in Lisbon, both used for private use by Galp, as shown in the chart below.

Chart 46 – The effective rate of use of the docking point as a percentage of the time that it is open in 2007



Source: Portuguese Competition Authority analysis based on data from the port authorities and concessionaires.

675. The existence of various points in a specific port that can be used as an alternative provides leeway for managing congestion at less cost for the operators wishing to use the port.

676. As we have already seen, the Port of Leixões may have two docking points, but one of them is out of service for a lot of time and the other has the level of highest congestion among all the points analysed (the occupation rate was 64% in 2007; and 71% in 2006).

677. This situation is particularly complex from the point of view of congestion management since there are no alternatives.

678. The port of Leixões in fact, for the period between 2006 and the end of the third quarter of 2008, was the port where the level of congestion had most effects on the costs for the operators who used it for loading and discharge of fuel for road use.

679. On average in this period, around 17 tankers/year of transport of fuel for road use were paid demurrage[98] costs by the users, thus making the transport of fuel more expensive.

680. This port not only had the highest costs for discharge of fuel (see the analysis detailed in paragraphs 518 and following), almost double the costs in Sines, but there was congestion that led to additional costs for the operators (due, for instance, to payment of demurrages, and others).

681. This situation results, on the one hand, from the limitations on expansion and development of the port itself, taking into consideration the surrounding urban fabric, and, on the other hand, the inexistence, up to 2008, of an alternative for the discharge of fuel for road use from tankers of large size in other ports within the area of influence of this port (in the north).

682. If the expansion plans for the port of Aveiro materialise, it is likely that in 2010 already there may exist in this port a docking point with capacity for taking competitive imports of diesel for road use. This will introduce a new competitive dynamic in regard to the port of Leixões and the Leça da Palmeira refinery.

683. In the port of Lisbon, in spite of the fact that the TL of the port of Buchos does not show any signs of congestion, this terminal cannot be replaced by the terminal of Barreiro, to the extent that are they are managed by different concessionaires in different regimes.

684. The terminal of the port of Buchos is managed by Galp on a private basis while Barreiro is managed by the LBC for public use.

[98] A demurrage – the costs with demurrage reflect additional payments for the carrier because the ship was not loaded/discharged within the time frame agreed.

685. This means that, in spite of the existence of congestion in the terminal of the Porto de Buchos, the congestion at the LBC terminal in Barreiro has to be managed autonomously, since there are no options involving recourse to other wharves for docking apart from the only one that exists at this terminal.

686. It follows from this situation that the port of Lisbon, during the period from 2006 up to the third quarter of 2008, had the second biggest number of ships paying demurrages.

687. Bearing in mind the fact that this is the only port where imports of fuel for road use can currently be made on competitive terms in the south of the country, this level of congestion should be reduced.

688. This means that in the ultimate analysis, there are only limited possibilities here for competitive imports of fuel for road use.

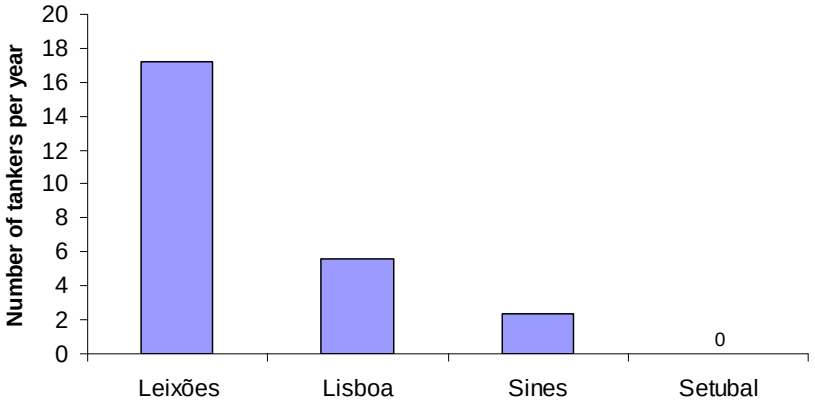
689. The three points that there are in the port of Sines, in spite of having reached congestion levels, are in fact managed as a single whole, allowing for a level of flexibility that does not exist in the port of Lisbon, and is more limited in the port of Leixões.

690. It is therefore possible to maximise the use of the wharves in Sines, and in spite of the level of congestion at each docking point, to reduce the impact of this situation in terms of the costs to the operators who use the port.

691. In fact, in the period from 2006 up to the third quarter of 2008, only 2 tankers of fuel for road use were charged for demurrages.

692. In the port of Setúbal, there was no congestion at the docking point, plus the fact that this was for private use, meant that, during the period from 2006 up to the third quarter of 2008, there were no examples of demurrage paid on ships carrying fuel for road use.

Chart 47 – Average annual number of ships for transport of fuel for road use paying demurrages in the period from 2006 to the end of the third quarter of 2008



Source: Portuguese Competition Authority analysis based on data from BP; Cepsa; Galp; Repsol.

6.3.16. Type of contracts used between the various operators

693. Apart from the conditions relating to sea ports and import depots, as conditioning factors for imports of fuel for road use, it is important to analyse the contracts for supply of oil-based products,[99] for the provision of logistical services[100], and for storage rental contracts.[101.102]

694. Supplies ex-refinery are normally, based on contracts covering supply and provision of services (logistics and storage). The duration is normally annual, renewable or for a longer period (3/5 years) and, typically, the contract defines the estimated date, the delivery point for the product, quantity and characteristics, the way that prices are set, invoicing and payment, definition of risk, and other elements.

695. The base price is the same for all operators (quotation *Platts*) with variable commissions normally added (for example: bonus for location, the rate for

[99] The contracts for supplies of oil-based products are contracts through which, over a period of time, a specific organisation supplies oil-based products to the other party.

[100] The contracts for provision of logistical services are contracts through which one party supplies specific logistical services to the other party, and this may include transport, storage, and despatching products.

[101] The contracts for leasing storage capacity are through which, over a period of time, a specific organisation leases storage capacity for oil-based products to the other party, against payment of an agreed amount.

[102] The majority of these contracts are mixed, or, in other words, notwithstanding the fact that they have a main purpose, they include characteristics of other types of contracts (for example, a storage contract and with terms from acontract for the provision of logistical services, a contract for supplies with terms from a contract for providing services).

services rendered), and some of these vary from operator to operator, depending on individual bargaining power.

696. Some of these contracts have "*matching*" clauses (if a more favourable import price is found, Galp will match it).

697. The contracts also in some cases set out maximum and minimum limits for quantities to be supplied, based on annual estimates for supply required per product, with penalty clauses for non-fulfillment.

698. Between the oil companies there are also "*swap*" contracts between Portugal and Spain (or "*swap* agreements", according to which there is an exchange of products and storage services) determining quantities of products and the Portuguese companies can collect from Spanish refineries and the Spanish companies can collect in Portugal from a Portuguese refinery.

699. More specifically, in a "*swap* agreement" between two companies, one of them agrees to make a specific volume of fuel available for the other at a specific site in exchange for the same volume of fuel made available by the other company at a specific site. The aim is to save on transport costs and these agreements are common in the oil sector.

6.4. Changes in the ex-refinery prices/cargo of fuel for road use in Portugal

700. Given that the level of ex-refinery prices of fuel for road use in Portugal has been analysed in section 6.3, it is important now to look at its changes during 2007 and 2008, in order to assess how they tracked the international prices used in reference to fuel, for instance the prices of north west Europe (for details, see the analysis at the start of subsection 6.3.1.7).

701. The ex-refinery prices charged in Portugal are fixed in contracts between the oil companies, which use mathematical formulae to index them to the Platt's prices charged in north western Europe (NWE).

702. Spreads are applied to the prices calculated in this way, reflecting situations such as the siting of the refinery, conditioning factors in the seaport terminals and import storage, and the competitive advantages of each purchaser.

703. The ex-refinery prices in Portugal are subject to change every Wednesday. These prices remain unchanged from that day in one week to the Tuesday of the following week.

704. Since early 2008, the price fixed on the Wednesday has been the average for the prices published by Platts for the fuel used as a reference from Monday to Friday of the previous week. These prices are converted into euros using the euro/dollar exchange rate published by the ECB.

705. In 2007, the formula for the calculation was similar, only differing to the extent that it took the average of the two previous weeks and not the average of the previous week.

706. This being so, the reason why changes in the ex-refinery prices in Portugal may not be the same as changes in the reference prices in North Western Europe is due:

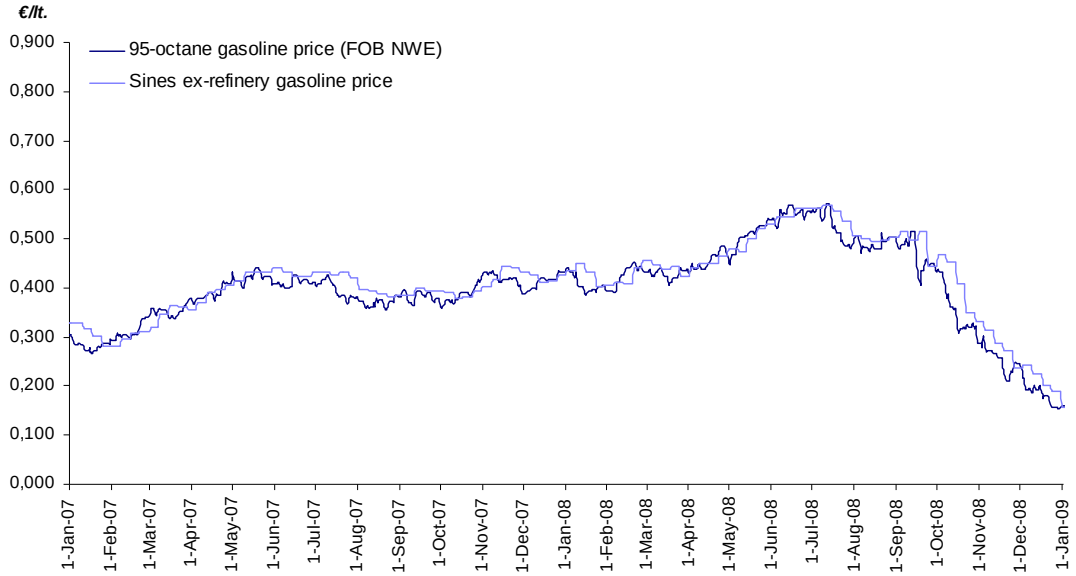
- Firstly, to the fact that the formula used in Portugal implies a time lag for the adjustment (on average around 1 week); and
- Secondly, to a smoothing out of prices implied by the fact that a five-day average is used and not the day's spot price.

707. Therefore, if we compare the ex-refinery prices in Portugal with the NWE prices, we will notice two points: that the ex-refinery prices in Portugal are more stable (they vary less, since they remain constant for each seven-day period), and they do not react so quickly to changes in NWE prices.

708. Therefore, in periods when NWE prices are rising, the ex-refinery prices in Portugal will go up with a lag and, in the same way, when NEW prices are falling, the prices in Portugal will go down with a lag too.

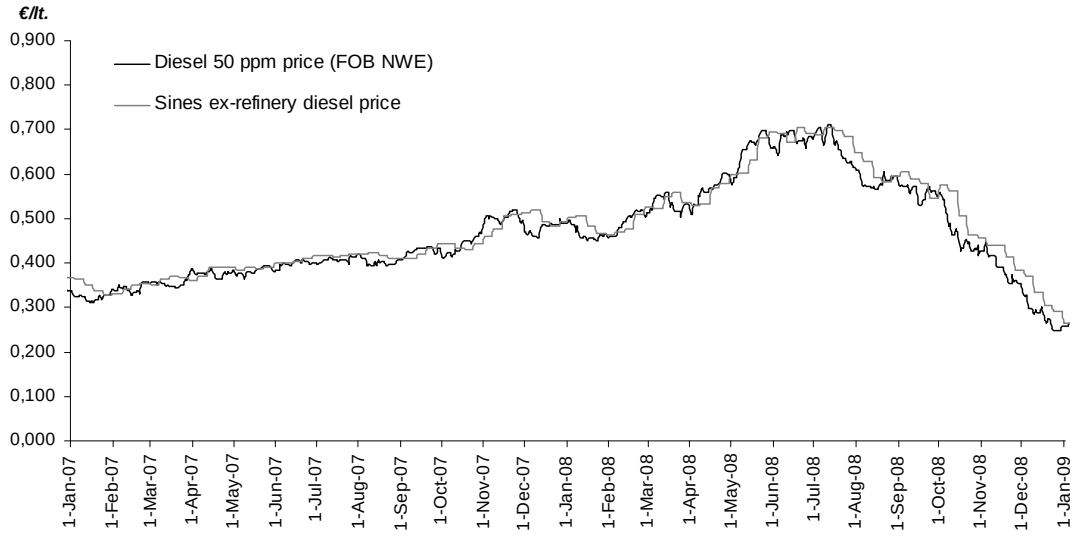
709. This situation is shown in graphic form below in the analysis of the changes during 2007 and 2008 of ex-refinery prices for 95-octane gasoline and diesel for road use in Sines by comparison with the respective prices in the market used as a reference.

Chart 48 – Evolution of international reference prices vs. ex-refinery prices in Sines for 95-octane gasoline (50ppm)



Source: Portuguese Competition Authority analysis based on data from the ECB, Platts and Galp Energia.

Chart 49 – Evolution of international reference prices vs. ex-refinery prices in Sines for diesel for road use (50ppm)



Source: Portuguese Competition Authority analysis based on data from the ECB, Platts and Galp Energia.

710. In 2008, the average quarterly ex-refinery prices of 95-octane gasoline in Sines moved as shown in the table below. These changes should be compared with the changes in the international reference prices mentioned in subsection 6.3.1.7 of this report.

Table 20 – Ex-refinery prices/cargo for 95-octane gasoline (Sines) in €/lt.

	2007	2008	Change between year-on-year periods	Change between year-on-year periods (%)
1st Quarter	0.320	0.430	0.110	35%
2nd Quarter	0.414	0.501	0.087	21%
3rd Quarter	0.404	0.516	0.112	28%
4th Quarter	0.412	0.305	-0.107	-26%
Annual	**0.388**	**0.438**	**0.050**	**13%**
Change from 4Q2007 to1Q2008		0.019		
Change from 1Q2008 to 2Q2008		0.070		
Change from 2Q2008 to 3Q2008		0.015		
Change from 3Q2008 to 4Q2008		**-0.211**		
Change from 4Q2007 to1Q2008 (%)		5%		
Change from 1Q2008 to 2Q2008 (%)		16%		
Change from 2Q2008 to 3Q2008 (%)		3%		
Change from 3Q2008 to 4Q2008 (%)		**-41%**		

Source: Analysis by the Portuguese Competition Authority based on data from Platts and Galp Energia.

Table 21 – Ex-refinery prices/cargo for diesel for road use (Sines) in €/lt.

	2007	2008	Change between year-on-year periods	Change between year-on-year periods (%)
1st Quarter	0.351	0.505	0.153	44%
2nd Quarter	0.392	0.628	0.236	60%
3rd Quarter	0.419	0.627	0.208	50%
4th Quarter	0.475	0.425	-0.050	-11%
Annual	**0.410**	**0.546**	**0.136**	**33%**
Change from 4Q2007 to1Q2008		0.030		
Change from 1Q2008 to 2Q2008		0.123		
Change from 2Q2008 to 3Q2008		-0.001		
Change from 3Q2008 to 4Q2008		**-0.202**		
Change from 4Q2007 to1Q2008 (%)		6%		
Change from 1Q2008 to 2Q2008 (%)		24%		
Change from 2Q2008 to 3Q2008 (%)		0%		
Change from 3Q2008 to 4Q2008 (%)		**-32%**		

Source: Analysis by the Portuguese Competition Authority based on data from Platts and Galp Energia.

711. In terms of diesel for road use, the changes in the average quarterly ex-refinery price in Sines in 2008 can be seen in the table below. These move should be compared with the changes in the international reference prices mentioned in subsection 6.3.1.7 of this report.

712. In short, as changes in the ex-refinery prices for Sines for both types of fuel for road use reflect the changes in the international reference prices (Platts NWE), with differences that stem from the formula used for definition of the ex-refinery prices in Portugal, as explained at the beginning of this section 6.4.

6.5. Refining Margins in Portugal and international comparisons

6.5.1. Introduction

713. Margins in refining operations can be expressed by reference to a wide range of indicators.

714. Refining margins are a composite indicator, bringing together the operations in the refining facilities as a whole. This makes it difficult to draw comparisons in terms of the quality of production in each specific refined product.

715. Not all companies use the same criteria to calculate these margins, and different criteria exist. The margins of the refining operations tend also to be sensitive to various factors (for example: rates that the refineries are in use, composition of the products produced and others).

716. To this can be added the fact that refineries do not evaluate their margins on a product-to-product basis. Instead, they gauge the margin of the refining facilities bearing in mind the wide range of products produced there.

717. This does not mean, however, that it is impossible to estimate the margins associated with the refining of each of the products, only that there are more difficulties in doing so.

718. In fact, section 4.2 presents an estimate of the gross margin of the refining operations in Portugal per product.

719. Some key indicator for determining the profitability of refining used by the companies are:

- The gross refining margin (where the gross refining margin is represented by the difference between the ex-refinery price and the cost of Brent (crude));
- The net margins of refining;
- The *crack* of gasoline and of diesel allow for an approximation to calculation of the refining margin for each product;

720. There follows a brief explanation of each of the indicators presented:

Gross refining margins

721. The gross refining margin is the difference between prices at which the refined products are sold (ex-refinery prices) and the cost price of the raw materials (crude).

722. As such, it is not a measure of profit because it des not include the costs of the refining operations apart from the costs with the raw materials, and not all the other variables. This makes it impossible to draw up a statement of results in the context of which it would be possible to specify the profit.

723. However, it is recognised in the refining industry as an indicator of performance and is frequently referred to in this context.

724. It has the advantage of allowing international comparisons to be made because it can be used in a model. This means it is comparable to international benchmarks which reflect a structure of production equivalent to that of the refinery for which the level of performance is being assessed. This does not always happen with the other indicators of performance in the refining business.

Net refining margins

725. The net refining margin comes into the frame not only with the costs for the raw material (crude), but also with the other operating costs of refining. For this reason, it is an alternative closer to the gross refining margin in gauging the capacity of the refinery business to cover their costs through the income from the sale of refined products.

726. However, there are different ways of imputing and booking costs, depending on the accounting criteria used by the refineries. This means that making a comparison of the net margins of refining between operators is not a simple thing to do.

727. An analysis of the temporal changes of the net refining margins is relevant from the point of view of gauging any change in performance of any single refining company over time.

Crack for diesel and crack for gasoline

728. In order to evaluate the level of performance for each product specifically, and in the case at issue these are gasoline and diesel for road use, it is important to determine what is commonly known as in the oil industry as the “crack spread” or simply “crack”.

729. The crack for diesel (for example) is the difference between the ex-refinery price of diesel (normally given by the quotation for the fuel in the north west of Europe) and the price of crude (normally Brent).

730. The following subsection contains a detailed analysis of the changes in each of the indicators mentioned above.

731. As a last point, there are other indicators that could be used for the evaluation of the performance of the refining operations, among them rates of occupation,[103] EBITDA,[104] Net results, ROIC,[105] and others. However, for the purposes of the analysis that the Portuguese Competition Authority has taken in hand, it seemed reasonable to use the three mentioned above.

6.5.2. Changes in the margins of refining operations in Portugal in 2007 and 2008

Changes in the gross refining margin and international comparisons

732. As explained in detailed in section 6.3, margins in Portuguese refineries depend:

- On their location (they are at a crossing point for important routes for the transport of crude and relatively far from the main centres for exporting fuel for road use – ARA and Genova/Lavera); and
- On the conditions for the operations of import of fuel for road use in Portugal, for instance in terms of availability, capacity and occupation of the docking points in the sea ports and the import depots.

733. The domestic refineries together come in with refining margins above the margins used as a reference for the North West of Europe when compared on the same basis, that is, when the comparison is between the gross margins based on the same product mix.

734. This situation can be seen in the chart below, where there is a comparison between the gross margin for refining operations in Portugal and two

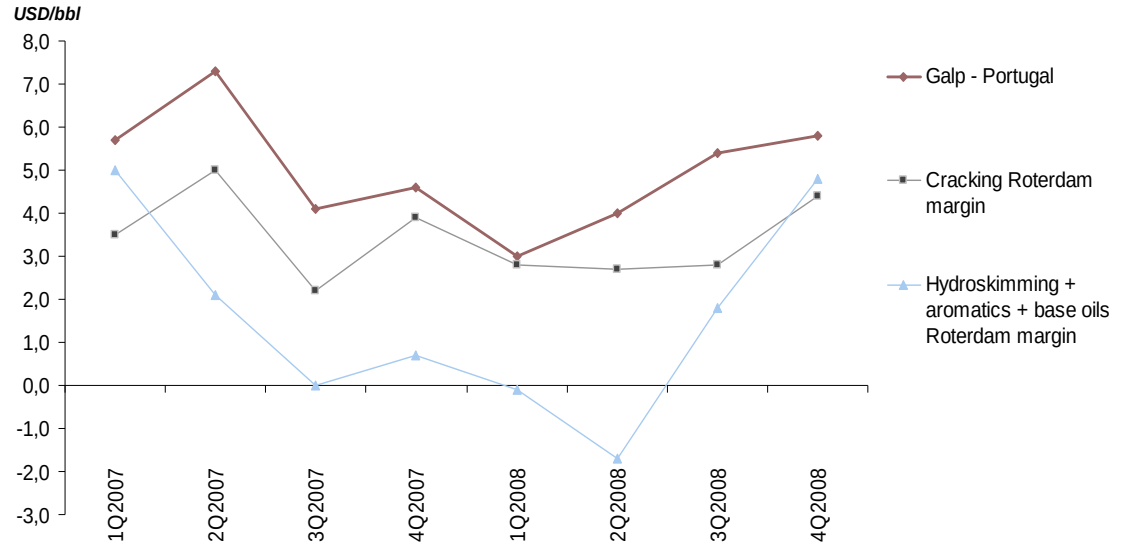
[103] There is a relationship between the rates of use of the refineries and the refining margins; that is, high refining margins, everything else being equal, means that there is probably also a high rate of use for the refinery.

[104] EBITDA – "Earnings before Interest, Taxes, Depreciation, and Amortisation", in other words, Operating results before depreciation and amortisation.

[105] ROIC – "Return on Invested Capital" is a financial measure quantifying the relationship between the cash flow generated by the company and the capital that it has invested.

benchmarks for margin for the North West of Europe. The first is known as Margin *cracking* Rotterdam (which gives a more precise comparison with the characteristics of the Sines refinery); and the other is known as the *Hydroskiming*+aromatic products+Rotterdam base oils Margin (which gives a more precise comparison with the characteristics of the refinery at Leça da Palmeira).

Chart 50 – Changes in the gross refining margin in Portugal and international comparisons in 2007 and 2008



Source: Portuguese Competition Authority analysis based on data from Galp Energia; Platts.

735. From the second quarter of 2007 up to the first quarter of 2008, there was a fall in the gross margin of the Portuguese refineries as a result of the increase in prices of crude during the period. This was not reflected in as proportional a way as an increase in prices of refined products.

736. The falling trend was visible in the international markets up to the end of the second quarter of 2008.

737. From the second quarter of 2008 in Rotterdam (and from the first quarter of 2008 in Portugal) there was an increase in the margins of refining.

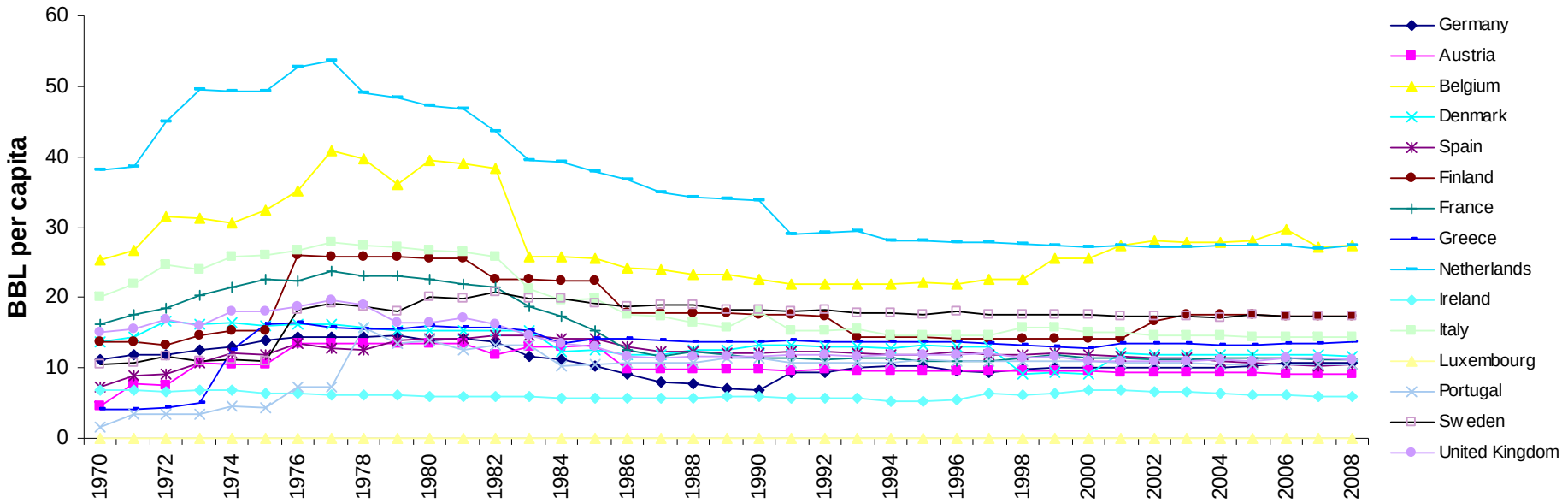
738. It should be noted that the oscillations in the margins of refining in Portugal are very dependent on two factors: one is the changes in the prices of crude in the international markets, and, as analysed in section 5.7, they are not "controllable" by Portuguese domestic refineries; and the other is the reference prices of refined products in North West Europe.

739. The gross margins depend also on some variables that can be controlled by the domestic refineries, for instance the efficiency of the productive process, rates of use and the product mix.

740. In the coming years there is likely to be a change in the gross margins of international refining resulting from:

- Replacement of gasoline by diesel for road use, a fact that will put upward pressure on the ex-refinery prices of diesel;
- Investments in refining capacity in Europe and above all in Asia. There was a fall in refining capacity in Europe in the 80s (see the chart below) and relative stability since then, but there are currently various investments in progress in a number of countries (including Portugal) to increase refining capacity. If the investment slated for this materialises, it could over time put downward pressure on the relative price of refined products in Europe;
- Change in the product mix. There are at present in Europe, and in particular in Portugal and Spain, projects in hand to reconvert existing refineries so as to maximise their product mix and increase the production of refined products with higher margins (diesel) and reduce the production of refined products with margins relatively lower or even negative (such as fuel oil). This situation could, over time, put downward pressure on the price of diesel and upward pressure on the price of fuel oil.

Chart 51 – Changes in the refining capacity in the EU15 from 1970 to 2008



Source: PCA based on IEA and OECD data.

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Changes in the net refining margin and international comparisons

741. During 2007 and 2008, the net refining margin in Portugal[106] followed a path that was very similar to that of the gross margin, and this translated into a very wide range of change.

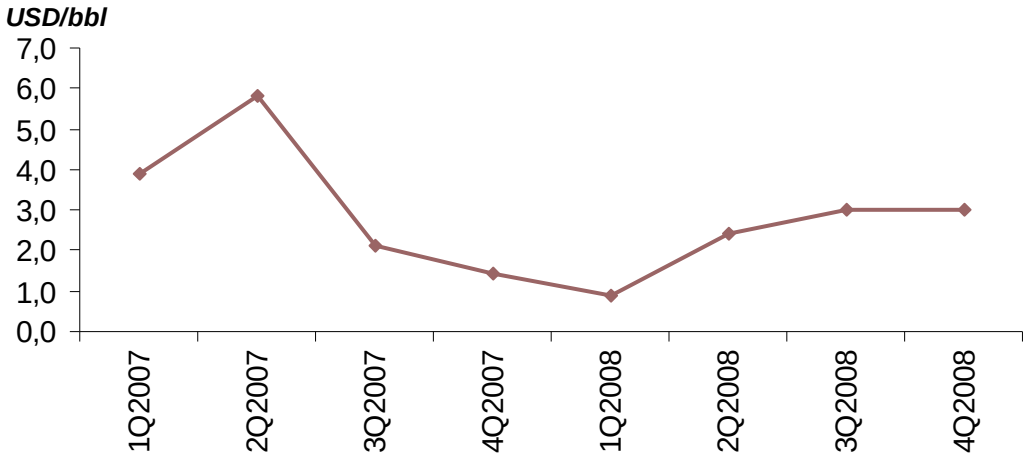
742. In this period, the net margin varied between 0.9 USD/barrel in the first quarter of 2008 and 5.8 USD/barrel in the second quarter of 2007.

743. As with the gross margin, the net margin fell from the second quarter of 2007 and up to the first quarter of 2008, after which it recovered somewhat.

744. According to public information from Galp, the net margin stabilised at around 3 USD/barrel in the two last quarters of 2008, as shown in the chart below.

745. The net refining margin in Portugal in the fourth quarter of 2008 was brought down by the relatively low rates of use of the refineries (72.9%) as a result of maintenance operations during the period.

Chart 52 – Changes in the net margin of refining in Portugal in 2007 and 2008



Source: Portuguese Competition Authority analysis based on published data from Galp

746. The net margins of refining tend to be cyclical. They normally go down when there is a steep rise in the price of crude and go up when the opposite happens. Most of the other production costs are relatively steady as they include a sizeable fixed component.

[106] For the purposes of calculation of the net margin, the operational costs were considered on a cashflow basis, to the extent that there is no more detailed information in the public domain at this level reported by the domestic refineries.

Move in crack for gasoline and for diesel

747. Changes in the crack for gasoline and for diesel during 2007 and 2008 show different trends.

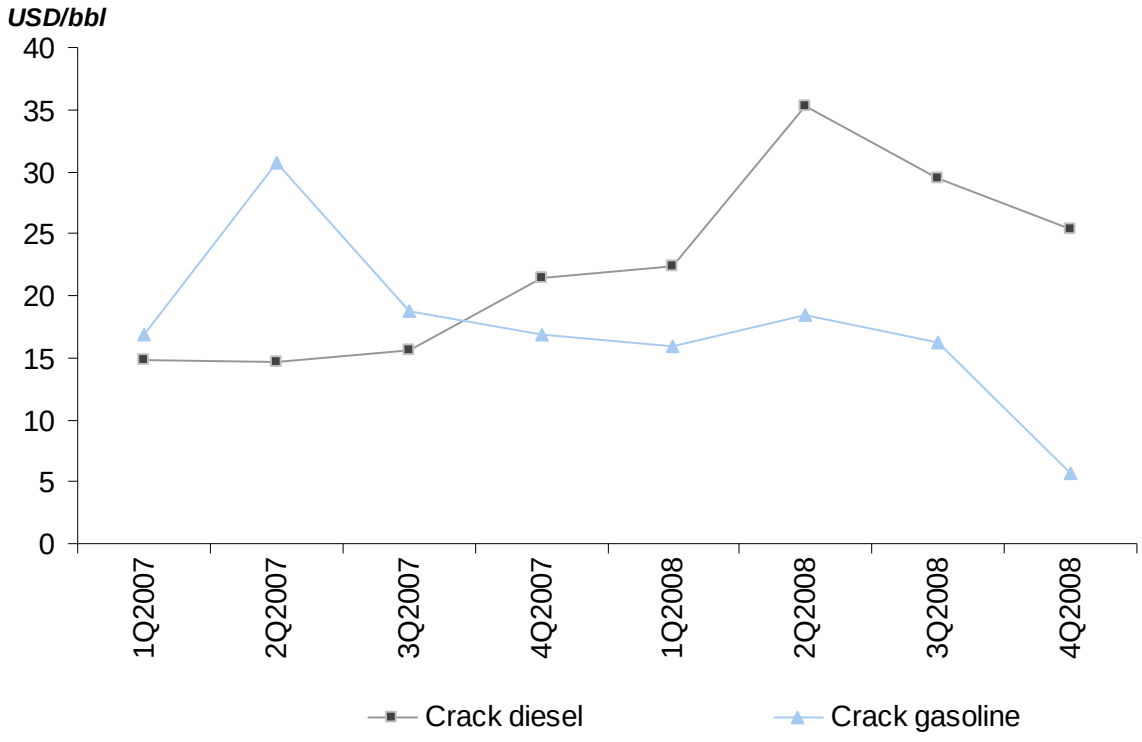
748. Crack for gasoline has been going down since the second quarter of 2007 while crack for diesel increased from the first quarter of 2007 up to the second quarter of 2008, with the trend reversing from that point.

749. From the fourth quarter of 2007 up to the end of 2008, crack for diesel was always above crack for gasoline.

750. In point of fact, in the fourth quarter of 2008, crack for diesel was four times higher than crack for gasoline.

751. These trends are shown in graphic form below:

Chart 53 – Changes in the *crack* of diesel and of gasoline in the North West of Europe in 2007 and 2008



Source: Portuguese Competition Authority analysis based on published data from Galp Energia.

752. The increase in crack for diesel compared with crack for gasoline results from the scarcity of diesel in Western Europe. In most countries here the

refineries produce less diesel than is consumed internally. This situation means that diesel has to come from farther away, a fact that is reflected in the relative ex-refinery prices of diesel compared with gasoline in Europe.

6.6. Conclusions

753. In absolute value, refining operations of fuel for road use in Portugal (including operating costs, cashflow and profit margin) added 199 million euros in the retail markets during 2008.

754. Most of the fuel for road use consumed in Portugal in 2008 (93% of gasoline and 81% of diesel) is produced in the two domestic refineries, both belonging to Galp, with the value of imports of fuel being of little significance.

755. In most European countries, imports have a more significant proportion in the consumption of fuel for road use (28.4% for gasoline and 33.2% for diesel on average in the EU15, in contrast with the 7% and 19% in Portugal).

756. In the absence of any barriers to import, the ex-refinery price in Portugal cannot be very far from Platts NWE quotations, to the extent that tendencially the domestic refineries will be in competition against other refineries located outside Portugal and with excess production (see subsection 6.3.1 of this Report).

757. A differential (positive or negative) is added to the base price (international quotations) as a result of negotiations between the domestic refineries (Galp) and the operators with capacity for storage allowing them to acquire large amounts.

758. Since liquid fuels are tradable goods, the ex-refinery price cannot be significantly higher or lower than the international reference price (in the case of Portugal, this is Platts NWE), to which is added relevant spreads (transport costs, freight, insurance, and others).

759. For this reason, the ex-refinery prices of gasoline and of diesel for road use in Sines and in Leça da Palmeira are near the IPP (import price parity) for these places.

760. The comparative advantage of the domestic refineries relative to imports derives from two basic elements:

- From the cost of transport (including freight, insurance, quality premiumes, costs with sea ports and wharfage) between an international refinery with excess production of this fuel and the domestic refineries; and
- From the degree of difficulty in importing fuel for road use (and this can result from various factors such as availability, characteristics and conditions for operations at the docking points in the sea ports; the existence, ownership and capacity of the import depots, among other factors).

761. In terms of the first item, the comparative advantage of domestic refineries results specifically from their geographical closeness to the country's large centres of consumption. This is an advantage that no refinery outside Portugal would have since acquiring products abroad implies the addition of transport costs (including freight, insurance, quality premiums, costs with sea ports and wharfage).

762. In terms of the second item, the comparative advantage of domestic refineries results from the constraints that there are in the seaports and import depots.

763. As far as the sea ports are concerned, there are eight docking points in Portugal that allow for the import of diesel for road use on competitive terms (see Table 19). Of these, two are for private use and the others are for public use.

764. Most of the docking points, in particular those in the north, in Leixões, and those of the liquid bulk terminal at Barreiro, Lisbon, are experiencing levels of operation that are close to congestion point, and from this will come added costs for their users (for instance, demurage).

765. The import depots in both the North and south of the country are held and used by a small number of operators.

766. The availability of import depots near docking points that are uncongested or with relatively low levels of congestion is therefore an important factor to bear in mind for the purposes of importing liquid fuels.

767. In order to improve access to imports of fuel for road use in the north of the country, it is important to ensure:

- That the plan to develop the liquid bulk terminal in the port of Aveiro goes ahead. This is the responsibility of the port authority and should be in the periods scheduled (during 2009) and with the possibility of making

discharges from tankers of tonnage higher than 30,000 tons carrying with diesel for road use;

- The adjudication, for public service, of the concession for the liquid bulk terminal in the port of Aveiro, safeguarding the limits of concentration in the light of Portuguese and community competition rules;
- The adjudication of future storage capacity, to be connected by pipeline to the docking point or points in the liquid bulk terminal at Aveiro preferentially to an independent operator;
- The speed of the licensing process for possible future expansion of the cluster of import depots connected to the port of Aveiro.

768. In the south of the country, specifically in the areas de Lisbon and Setúbal, there are environmental and urban planning constraints that restrict the expansion of the infrastructures for importing liquid fuels.

769. It is therefore necessary to ensure the streamlining of import operations by third parties through of the port of Sines. This is the only port in this part of the country that allows for the discharge from tankers of tonnage higher than 30,000 tons carrying diesel for road use.

770. The highest degree of competitiveness in prices in mainland Portugal with the infrastructures that are essential for the discharge of large tankers is found in the port of Sines.

771. In order to improve access for imports of liquid fuels through the port of Sines, by independent operators for example, it would be desirable:

- To put out an international public tender (set up through the port of Sines) for concession of an area able to take import depots with capacity for at least 200,000m^3, and with the possibility of expansion;[107]
- To ensure the connection by pipeline from the depots to be built there to the loading bays of the TGLS, properly operating and non-discriminatory in terms of the existing connections to the refinery depots;
- To ensure the connection by pipeline between those depots and the CLC pipeline;
- To ensure that operations for access to the CLC pipeline and its use, in the Sines-Aveiras connection, are regulated in an independent way, in

[107] The figure of 200 thousand m^3 was used on the basis of estimates of changes in demand for storage capacity.

accordance with a code that is not based on elements which maintain entrenched positions and volumes of dispatch for specific companies and which is flexible in so far as it allows for discharge from large tankers;

- To ensure the possibility of using adequate sized storage (either already existing or to be built, with connection to the pipeline), on the CLC site, so as to guarantee finalisation of the import process, through the port of Sines, on competitive terms;

772. It would be preferable if the area were ceded to a non-oil company that was a specialist in the management of import depots of fuel for road use, always safeguarding the limits of concentration in the light of the rules of Portuguese and community competition.

7. Storage and transport by pipeline

7.1. Introduction

773. As detailed in the analysis of the value chain of the fuel for road use in section 4.1, the fuel for road use, either produced by the domestic refineries or imported, also pass through various stages of the value chain until they reach the consumer.

774. These products, of course, need to be stored and transported up to the point of sale.

775. It is from the moment when the products are made available by the refineries or from the tankers that they need to be stored.

776. This first stage of storage is guaranteed the import depots/refineries.

777. These depots are connected by means of transport for large volumes (in Portugal, pipelines and large tankers) which allow for routing of the refined products to depots for distribution or directly to the service stations located in their area of influence.

778. In the Portuguese case, the import depots/Sines refinery are the only ones connected by long-distance pipeline to the distribution depots in Aveiras de Cima, in the Lisbon region.

779. The products are then sold from distribution depots, smaller than the import depots, and this makes it possible to have storage facilities near points of sale (service stations). The products are transported here by tanker truck.

780. The refineries and the import depots can also provide a local supply, that is, direct to the service stations located in their area of influence.

781. The main storage fuel depots for road use currently in mainland Portugal are in Matosinhos (Leça da Palmeira and Matosinhos), Aveiro (Gafanha da Nazaré), Aveiras de Cima, Lisbon (south bank), Setúbal and Sines.

782. In the table below there is a summary of the main storage areas in Portugal (including import depots and secondary storage):

Table 22 – List of the usable storage capacity for fuel for road use existing on Portuguese territory at the end of 2008

Northern zone	**Usable capacity in m^3**
Leça/Matosinhos	[230,000-240,000]
Aveiro	[70,000-80,000]
Total	**[300,000-310,000]**
Southern zone	
Lisbon	[350,000-360,000]
Sines	[350,000-360,000]
Aveiras	[220,000-230,000]
Setúbal	[40,000-50,000]
Total	**[980,000-990,000]**
Total domestic	**[1,280,000-1,290,000]**

783. According to the main operators in retail sales of fuel in Portugal, the average one-way distance between the storage depots and the service stations in 2007 and 2008 was a little under 100km.

784. This is an average, so the figure may not give a good estimate of the area of influence of the storage depots since a very big number of service stations are located along the coastal strip and for this reason they are closer to the storage depots, which are all located along this strip.

785. The European Commission has concluded in a number of decisions relating to other countries that the area of influence of storage depots is 150km.

786. It therefore seems reasonable that more than 90% of the service stations served by a specific storage depot are within a maximum radius of 150km by road.

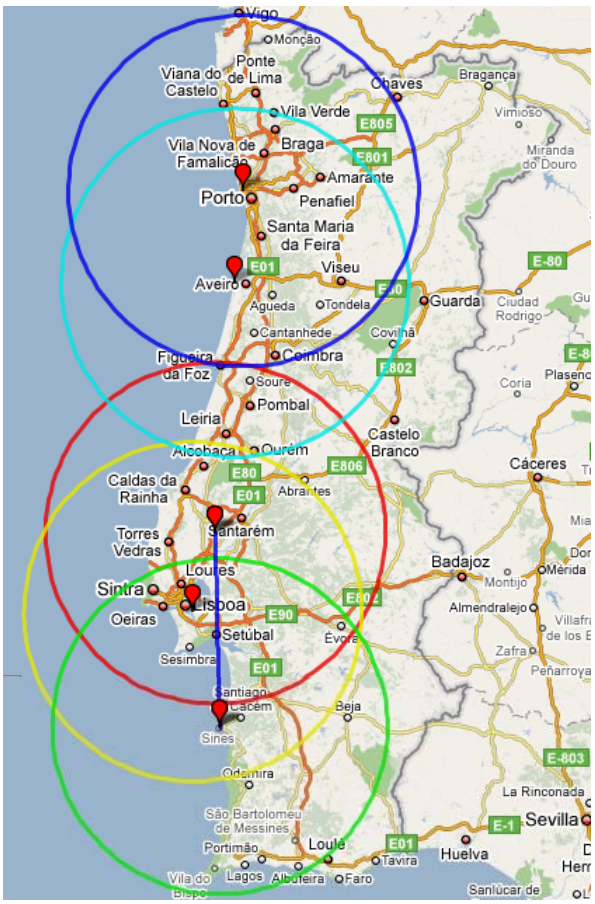
787. Based on this criterion, the Portuguese Competition Authority estimated the areas of influence of the storage depots in Matosinhos, Aveiro, Aveiras de Cima, Lisbon, Setúbal[108] and Sines, detailed in the illustration below.[109] For the purposes of this analysis, and for reasons that will be explained shortly, they can be grouped into two large areas of influence: the northern zone

[108] The area of influence of Setúbal was not included on the chart as it is very similar to Lisbon. Including it would make the illustration more difficult to read.

[109] The area of influence of the depots in Setúbal are probably mid way between the area of influence of Sines and of Lisboa and it was therefore not included in the chart given the smaller relative importance of these facilities.

(Matosinhos and Aveiro) and the southern zone (Aveiras de Cima, Lisbon, Setúbal and Sines).

Illustration 8 – Map of the area of influence of the storage depots in Matosinhos, Aveiro, Aveiras de Cima, Lisbon and Sines.



788. From the analysis carried out, a big overlap can be seen very clearly between the areas of influence of the storage depots in Sines, Setúbal, Lisbon and Aveiras de Cima, with the area of influence de Lisbon and Setúbal, taking in more than half the area of influence of Sines, and the area of influence of Aveiras de Cima includes more than half the area of influence of Lisbon.

789. Therefore, from the point of view of an analysis of the conditions for competition at the level of distribution depots and coastal depots, there could be deemed to be a reasonable choice available between the depots in Sines, Setúbal, Lisbon and Aveiras de Cima.

790. For this reason, this report will look at this cluster of depots from an integrated perspective. From here on, the area of influence of these depots will be called the area in the south.

791. There is a further point here, specifically as regards the import depots in Sines, since they are connected by pipeline to the distribution depots of Aveiras de Cima. This means that their areas of influence include not only the area of influence of Sines (given that the import depots can also be used for secondary distribution), but also the area of influence of Aveiras de Cima.

792. The storage depots in the north of the country, in Matosinhos and in Aveiro have overlapping areas of influence that cover more than 50% of the area. From a competition perspective, therefore, there could be deemed to be a reasonable choice available between these depots.

793. The overlapping of the areas of influence of the depots in Matosinhos and Aveiro with those of the depots in the south of the country is of little relevance.

794. The area of influence of the depots in Matosinhos do not overlap any of the depots in the south and the area of influence of the depots in Aveiro do not overlap more than 25% of the area of influence of Aveiras de Cima.

795. It should be added that the current capacity of Aveiro is equivalent to only a very small fraction of the capacity in Aveiras de Cima and therefore the possibility of substitution of the storage depots located in Aveiras de Cima by those located in Aveiro is clearly limited.

796. Therefore, the area of influence of the storage depots and also of the import depots located in Matosinhos and in Aveiro will, for the purposes of this analysis, be called the areas in the north.

797. The operations of storage and transport of fuel for road use together added 111 million euros to the figure for the retail sales of fuel in 2008 (34 million euros for gasoline and 77 million euros for diesel).

798. An analysis of the competitive conditions that exist in terms of storage and transport of fuel is relevant not only in terms of each of the markets concerned but also of the impact that storage and pipelines have in particular on competition at the level of various interconnected markets (ex-refinery/cargo, bulk, retail).

799. For one thing, the structure of competition in terms of import depots, as seen in the previous section, affects competition in ex-refinery sales.

800. Moreover, the structure of competition at the level of depots and transport by pipeline also affect competition for retailers of fuel for road use.

801. A long-term, competitive presence in retail sales of refined products is, in general, closely dependent on the logistics infrastructure available for supplies.

802. In this way, the independents can gain a competitive edge, and they can become more active in retail sales of fuel (i) the greater the possibility of access to the three elements in the logistics chain (import depots, pipelines and distribution depots) and (ii) the greater their corresponding financial and organisational capacity. This will allow a greater choice between:

- Going for local supplies in the bulk markets from oil companies or other companies operating at this point (and these will, if necessary, transport the product up to the distribution depots nearest the service stations of their clients), or
- Getting their supplies in the international market (passing through an import depot), or even at domestic refineries, which are possibly in a more competitive position. In these cases, they themselves will have to guarantee transport, either by tanker trucks (if the service stations to be supplied are near the refinery or the import depot), or via the pipeline system to “local” storage in the distribution depots.

803. In this way, because of their relevance not only in themselves but because of their impact on the other markets, section 7.2 of this chapter will be given over to an analysis of the competitive position of import depots; in section 7.3 the competitive position of the secondary distribution depots will be assessed and this will be followed in section 7.4 with a similar appraisal of the competitive position of the pipelines.

7.2. Import storage

7.2.1. Introduction

804. Import depots can be defined as points with the capacity to take loads from large capacity ships (30,000 tons to 50,000 tons), that is, cargoes (made up of imported products) transported in ships capable of taking large amounts.

805. These depots allow for the storage of all the liquid fuels that are connected by pipeline to seaports.

806. Import depots provide for a demand that is different from other depots such as the other coastal distribution depots.

807. The fact is that although import depots can provide supplies for nearby service stations, they can also allow for the competitive import of fuel in large ships, unlike other depots.

808. For operators who wish to make imports of fuel for road use, only the import depots are relevant, to the extent that they are the only option and would have to be used even if rentals were higher than other depots. The fact is that lack of access to transport for large amounts means that there is fundamentally no option other than to use these depots for the purposes of imports on competitive terms.

809. For these reasons, there is no available option to the import depots connected to means of transport of large volume (ships of between 30,000 and 50,000 tons) and the other storage fuel depots for importing fuel for road use.

810. Moreover, from a geographical perspective, the site of the import depot is not irrelevant for an operator looking to import fuel for road use. That is, it does not matter whether the import depot is connected to the Port of Leixões or to the port of Lisbon.

811. After the import has been made, the issues of storage capacity and secondary transport to the depot are critical, since the average storage time for the product depends on this and this impacts on the costs incurred by the operator.

812. At any specific moment, therefore, the geographical location of the import depot is not irrelevant if the aim is to provide supplies in various areas of influence.

813. The analysis of competition among import depots will be made with a separation of the country into the north (which will include the import depots located in Matosinhos and in Aveiro) and the south (which will include the import depots in Sines, Setúbal and Lisbon).

7.2.2. The demand for import storage

814. The demand for import storage in Portugal[110] during 2007 and 2008 came from the oil companies (Galp[111], BP, Cepsa and Respol).

815. In the last years there has been an increase in demand for import depots from these operators (just during the 2007 to 2008 period there was an increase of more than 400,000 m^3 in the discharge of fuel for road use imported by sea).

816. This increase in demand results from two different factors that need to be analysed.

817. In the first place, there is the imbalance between production and consumption of fuel for road use in Portugal, with the consumption of diesel growing beyond the capacities of domestic refining facilities, and this means that imports are needed and therefore storage capacity for imports.

818. In the second place, and this is a smaller factor, there is the increase in demand for imports and, consequently, for import depots. This stems from the fact that purchases from domestic refineries are being replaced by imports from other oil companies, among which diesel for road use.

819. This pressure on demand is likely to be with us in the coming years to the extent that investments in reconversion of the domestic refineries are in progress (precisely with a view to increasing the production of diesel). This, in the short term, will possibly mean that the refineries will not be used so much and this will boost the need for imports of diesel for road use.

820. Just from 2007 to 2008, this adjustment shortfall between domestic production and demand for diesel for road use implied an increase of more than three times the imports of diesel for road use coming in by sea for the domestic refineries.

821. In the long term, however, when the reconversion of the domestic refineries is concluded, there will be an increase in domestic production of diesel for road use and therefore this trend towards the domestic refineries increasing imports of diesel for road use is likely to turn around after 2010/2011.

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110 This is understood as the quantity of demand effectively satisfied.

111 This list included Esso in 2007 and 2008 before its facilities were acquired by Galp Energia.

822. As for replacing purchases from domestic refineries, Repsol, BP and Cepsa all increased their imports of diesel for road use by sea because this was more attractive than purchasing at domestic ex-refinery prices.

823. Consequently, their needs for import depots increased by 14% from 2007 to 2008. However, the total imports of these operators in fact went down with a fall in imports overland (see the analysis in subsection 6.2.2).

7.2.3. The supply of import storage

824. In the analysis of the supply of storage capacity for imports, there will be an assessment of the import depots existing in the north and south of the country.

825. Subsection 7.2.4 will include an analysis of the obstacles to penetration and expansion of the capacities for import storage (existing or potential) in each of the zones.

In the north

826. In the north, in 2007 and 2008 the existing depots were:

- In the refinery of Leça da Palmeira (owned by Galp);
- In the Parque do Real, in Matosinhos (where there are Repsol and Galp import depots[112]);
- In Matosinhos, in the storage area belonging to Cepsa/APDL (the Leixões port authority).

827. Therefore, the only companies with import depots for diesel for road use on competitive terms in the north of the country in 2007 and 2008, were the three oil companies Galp, Repsol and Cepsa (as per the table below), without the presence of BP and the independents.

828. Even so, the import potential of the companies in 2007 and 2008 was rather asymmetric, with Galp holding [55%-60%] of the import depots, Repsol on [20%-25%] and Cepsa [15%-20%], as shown in the table below.

[112] BP has usable capaciy in the Parque do Real that is less than 10,000m^3, and therefore, form the start, these facilities are not suitable for taking ships for the import of diesel for road use on minimally acceptable competitive terms. Therefore these depots are taken to be for secondary distribution and will be analysed in section 7.3. The Galp depots in the Parque do Real are also relatively small, though they could be used as a complement to those of the refinery at Leça da Palmeira, and therefore they were aggregated with the import depots near the Leça da Palmeira efinery.

Table 23 – Summary of the usable capacity of the import depots in the north of the country in 2008, in m^3

	Usable capacity of the import depots (m^3)	% of the total
Galp	[120,000-130,000]	[55%-60%]
Repsol	[50,000-60,000]	[20%-25%]
Cepsa	[40,000-50,000]	[15%-20%]
Aggregate	**[210,000-240,000]**	100%

Source: Companies.

In the south

829. In the south of the country, the potential import depots are near the seaports of Sines, Setúbal and Lisbon.

830. The only depots capable of storage of fuel for road use connected by pipeline to the port of Sines are the depots in the Sines refinery.[113]

831. In 2007 and 2008, therefore, the only depots capable of use as import depots in the south, with the possibility of taking ships of between 30,000 and 135,000 m^3, are in the Sines refinery.

832. These depots have an aggregate usable capacity of more than 350,000 m^3 and are owned by Galp.

833. As for the Port of Setúbal, and as analysed previously (see subsection 6.3.2.2.3), the only import depots there that are capable of storing fuel for road use are owned by Galp.

834. These depots have a usable capacity for [40,000-50,000 m^3] and are linked to the wharf for private use for which the same company has the concession.

835. As for the Port of Lisbon, as per the analysis in subsection 6.3.2.2.3, in 2007 and 2008, the only import depots capable of taking imports of fuel for road use on competitive terms were in two terminals:

- In the liquid bulk terminal in the Port of Buchos, operated by Galp, where there are import depots with a usable capacity of [40,000-50,000] m^3. These import depots of fuel for road use belong to Galp, following acquisition of the Exxon Mobil operations in Portugal in 2008. They should be divested

[113] The other storage depots in or very near the port of Sines (all of them structured for chemical products and other composites with very specific storage characteristics), are not connected by pipeline to the wharves and, according to their owners (Carbogal, Repsol, Euroresinas), they are not in any case suitable for storing fuel for road use.

by Galp, in line with the measures imposed by the European Commission for the approval of this business concentration.

- In the liquid bulk terminal in Barreiro there are import depots belonging to the LBC and CUF with a usable capacity of [100,000-115,000] m^3. These import depots were used in 2007 and 2008 by Cepsa, BP and Galp.

836. In short, in the south of the country, in 2007 and 2008, because of the conditioning factors relating to the sea ports, to the storage depots and access to the depots, there were only four places with import depots (Sines, Setúbal, the port of Buchos and Barreiro), with 3 of these storage complexes held and used by Galp (one of these complexes is to be hived off) and one of them is held by LBC and used by Cepsa, BP and Galp.

837. So, at the end of 2008, Galp owned [75%-80%] of the usable capacity of import depots that there are in the south of the country.

Table 24 – Summary of the usable capacity of the import depots of fuel for road use in the south of the country in 2008, in m^3

	Usable capacity held (in m^3)	
Galp	[440,000-450,000]	[75%-80%]
LBC (including CUF)	[110,000-120,000]	[20%-25%]
Aggregate	**[550,000-570,000]**	**100%**

Source: Companies

838. If the capacity held and used by each owner of the storage[114] is taken into consideration, and to this is added the capacity available for rent, then a calculation of the usable capacity which Galp holds should also include the capacity for storage for imports rented in the liquid bulk terminal in Barreiro.

839. Indeed, Galp held [80%-85%] of the usable capacity of import depots in 2008, as shown in the table below.

[114] It is important to note that a substantial part of the storage held by Galp in the south was used by EGREP – between 250 and 300 thousand m^3, in 2007 and in the first nine months of 2008.

Table 25 – Summary of the distribution of the usable capacity of import depots for fuel for road use in the south of the country as a function of the user in 2008, in m^3

	Usable capacity rented (in m^3)	
Galp	[460,000-470,000]	[80%-85%]
BP	[60,000-70,000]	[10%-15%]
Cepsa	[30,000-40,000]	[5%-10%]
Aggregate	**[550,000-580,000]**	100%

Source: Companies.

7.2.4. Penetration and expansion in import storage operations

840. It would be difficult to build new import depots in mainland Portugal for reasons connected to environmental regulations, land use criteria, restrictions on the circulation of tanker trucks, and for economic reasons.

841. Even if some sites with import depots lend themselves to enlargement, within limits that will be analysed below, this would still not be enough to solve a situation that is currently near overload.

842. Give these general considerations, there will be a detailed analysis of the conditions for penetration and expansion in the business of making storage capacity available for importing fuel for road use in the north and the south of the country.

In the north

843. According to most operators in the market and having heard the opinion of the APDL, any expansion of the import depots connected to the port of Leixões is practically impossible.

844. This is fundamentally due to the fact that the port of Leixões is locked into a highly urbanised area, with little land available, and where it would be difficult to build new depots without raising issues of safety, the environment and land use, apart from the difficulties of transporting large quantities in tanker trucks.

845. Therefore, in the medium term there would seem to be little chance of building new import depots connected by pipeline to the port of Leixões.

846. The port of Aveiro, in 2007 and 2008, could only take small ships transporting fuel for road use and this means that the port was no more than a coastal depot. If the proposed scheme to improve the port facilities materialises, the forecast is that the storage depots existing there could function as import depots.

847. These depots belong at this point in time to the Martifer group and are mainly used by BP. Their idea is, with time, to overcome the logistic shortfalls which do not at present allow for the import of diesel for road use for the north of the country on competitive terms.

848. If port capacity can be increased, these depots will provide an extra [70,000-75,000]m^3 for import depots of fuel for road use

849. According to the various operators contacted, it is estimated that the capacity of import depots installed with connection to the Port of Aveiro could theoretically reach, in the short term, [100,000-110,000] m^3.

850. Such a (theoretical) estimate should be assessed with some caution to the extent that this expansion will always depend on approval by the competent authorities, among them the Portuguese Environmental Agency (Agência Portuguesa do Ambiente). There are thus legal imperatives that demand a prior study of environmental impact for any storage with an aggregate capacity of more than 100,000m^3.

851. According to most of the operators, because of the characteristics of the other ports in the north of the country, it would not be minimally viable to build import depots of fuel for road use connected to the ports by pipeline, according to the conditions currently existing and any foreseeable medium-term changes.

852. Therefore, from a medium-term perspective, if ownership of these depots stays exactly as is, Galp will have [40%-45%] of the import depots, Repsol [15%-20%], Cepsa [10%-15%], and Martifer [20%-25%], as shown in the table below.

Table 26 – Summary of the usable capacity of the import depots of fuel for road use in the north of the country in 2008 and an estimate for 2010, in m^3

	2008		2010 (Estimate made by the Portuguese Competition Authority)	
Port of Leixões				
Galp	[120,000-130,000]	[55%-60%]	[120,000-130,000]	[40%-45%]
Repsol	[50,000-60,000]	[20%-25%]	[50,000-60,000]	[15%-20%]
Cepsa	[40,000-50,000]	[15%-20%]	[40,000-50,000]	[10%-15%]
Port of Aveiro				
Martifer	0	0%	[70,000-80,000]	[20%-25%]
Aggregate	**[210,000-220,000]**	100%	**[290,000-300,000]**	100%

Source: Companies.

853. It should be noted that most of the storage capacity of the Martifer import depots is rented to BP on a long-term contract.

In the south

854. The port of Sines has a unique strategic location, not capable of being replicated from the point of view of a location for import storage depots.

855. Not only does it benefit from the existence of a deep water sea port, which means that large tankers can discharge (impossible in any other port in Portugal), but it also has a pipeline which makes it possible to transport large quantities of fuel for road use to the distribution depots of Aveiras de Cima, and this covers the most densely populated area of the country.

856. Currently, the import depots that exist in Sines are inside the refinery. There is evidence that the existing restrictions are not such as to hinder expansion of the depot complex in the Sines refinery, in spite of the problems posed as regards the environment, the urban fabric and the transport of dangerous goods.

857. In point of fact, the project to reconvert the Sines refinery is classified as PIN+, and the expansion of the area of land allotted to it will make it possible to expand the storage capacity that exists in the refinery, if this is what is wanted.

858. As for the other operators who wish to build import depots in Sines, the following must be borne in mind:

- The availability of land free for the development of import depots of a suitable size and economically viable;
- This land must satisfy the requirements relating to the environment, the urban fabric and the transport of dangerous goods.

859. To assess whether there is land free or easily made available, two points must be borne in mind:

- The possibility of connection of the depots to the docking points at the sea port on competitive terms, and this puts an immediate restriction on the distance of these depots from the port;
- The possibility of connection from the depots to the CLC pipeline which links Sines to Aveiras.

860. The first condition restricts the number of places where these depots could be sited.

861. Clearly, the farther these facilities are from the port, the less economically viable they are, given the investment in pumping capacity that is needed and the restrictions on the ships that offload.

862. One alternative, because of its location, would be a portion of land that exists in the TGLS concession area.

863. According to some operators, such a storage area would only with difficulty go beyond 80,000m^3, and such a size would seem to be insufficient, without the possibility of offering storage capacity for imports attractive enough for construction of import depots on competitive terms.

864. In point of fact, it could have been the low potential for development of this storage area that caused some international competitors not to bid in the public tender for the service concession of the TGLS operation.

865. Apart from this area, the first criterion would only be fulfilled in principle if another area next to the TGLS were made available. That is bigger than the one described above and is currently under the jurisdiction of the Sines port authority.

866. The economic viability of this area, however, can only be assessed when there are specific projects, and these will depend, among other things, on their size.

867. But for the competitors of Galp to be able to use this area to build storage depots, and as mentioned in the conclusions to chapter 6 (paragraph 771), it would be necessary to ensure firstly, that the Sines port authority would be interested in making a sub-concession of this area; secondly, that connection by pipeline would be guaranteed from the depots to be built there to the TGLS loading bays fully operational and in a non-discriminatory way compared with the connections that there currently are for the refinery depots; thirdly, that the possibility of laying a pipeline between these potential depots and the CLC pipeline would be guaranteed; and fourthly, that there would be an assurance that adequate storage would be possible (either as is or to be built, with connection to the pipeline) in the Aveiras complex.

868. In the same way, and as mentioned above (paragraph 772), the area should be ceded in preference to a non-oil company that is a specialist in the management of import depots of fuel for road use, while safeguarding the limits of concentration in the light of the rules of Portuguese and community competition.

869. There are other areas farther away from the port of Sines which are very doubtful. This is because of *(i)* the fact that they may present very high operating costs related with temporary storage[115] and high pumping capacities, even though they may have the capacity for import depots to be built on competitive terms, and *(ii)* the fact that they need to fulfill the same requirements relating to the environment, the urban fabric and the transport of dangerous goods as the area previously analysed.

870. As for the port of Setúbal, expansion of the existing import depots of fuel for road use is conditioned at the very start by the fact that the only terminal which allows for discharge of fuel for road use on competitive terms is subject to a concession for private use by Galp.

871. It is therefore only this company that is in a position to expand its storage depot complexes. According to them, such expansion would be viable but only for a very small number of depots.

[115] Storage which is to guarantee the stability and the pressure of the flow.

872. For any other operator, the fact that there are no wharves that could be used for discharge would be a sufficient enough hindrance to be put off building a business around import depots in this port.

873. In the port of Lisbon, according to the operators consulted, "it is very difficult to pick out land where it would be possible to build fuel storage depots because of the environmental and urbanistic restrictions in the surrounding area."

874. In the Barreiro terminal the LBC accepts that it would be possible to expand the storage capacity of depots to around [100,000-200,000]m^3. However, there are no studies to show whether this would be possible in environmental and urban terms or bearing in mind the impact on road traffic.

875. Apart from this, the analysis in subsection 6.3.2.2.4 shows that the current capacity in this terminal is on the brink of congestion, and therefore such an expansion of storage capacity would necessarily limit the competitiveness of the new storage depots to be built to the extent that it would impose congestion costs on the user and make the products discharged more expensive.

876. Moreover, some operators referred to the fact that it was not possible to expand the storage depot area beyond what currently exists (and this itself results from recent expansion).

877. Therefore, in the port of Lisbon the only opportunity for other operators to penetrate and set up import depots would be through acquisitions.

878. In point of fact, this will of necessity occur in relation to the facilities of the port of Buxos (currently the property of Galp) as a result of the measures imposed by the European Commission when Galp acquired the Esso operations in Portugal.

879. As for the possibility of creating import depots near other ports in the south of the country, this would not be economically viable, according to most operators, because of the characteristics of these ports and bearing in mind the conditions for loading and discharge at the liquid fuel terminals. There is no indication that the conditions currently prevailing will change in any relevant way in the medium term.

880. So, from a medium-term perspective and if these depots remain in the hands of Galp, it will have [70%-75%] of the import depots, the LBC will

have [20%-25%], and a third operator (or possibly the LBC itself) will have [5%-10%] as a result of Galp hiving off the depots in the port of Buchos.

Table 27 – Summary of the usable capacity of import depots for fuel for road use in the south of the country in 2008 and an estimate for 2010, in m^3

	2008		2010 (Estimated)	
Port of Sines				
Galp	[350,000-360,000]	[60%-65%]	[350,000-360,000]	[60%-65%]
Port of Setúbal				
Galp	[40,000-50,000]	[5%-10%]	[40,000-50,000]	[5%-10%]
Port of Lisbon				
Galp	[40,000-50,000]	[5%-10%]	0	0%
LBC (includes -20CUF)	[110,000-120,000]	[20%-25%]	[110,000-120,000]	[20%-25%]
Others	0	0%	[40,000-50,000]	[5%-10%]
Aggregate	**[560,000-570,000]**	**100%**	**[560,000-570,000]**	**100%**
Galp	[440,000-450,000]	[75%-80%]	[395,000-405,000]	[70%-75%]
LBC (includes CUF)	[110,000-120,000]	[20%-25%]	[110,000-120,000]	[20%-25%]
Others	0	0%	[40,000-50,000]	[5%-10%]

Source: Companies.

881. In the liquid bulk terminal at Barreiro, where the import depots do not belong to Galp, the company has rented part of the storage capacity.

882. Taking into consideration what is mentioned above, it is probable that in the medium term, only two or three companies apart from Galp, i.e. Cepsa and BP and maybe one other (depending on how the divestment of the depots in the port of Buchos works out) will have access to import depots in the south, as shown in the table below.

Table 28 – Distribution of the usable capacity of the import depots that exist in the south as per the user

	2008		2010 (Estimated)	
Galp	[460,000-470,000]	[80%-85%]	[410,000-420,000]	[70%-75%]
BP	[60,000-70,000]	[10%-15%]	[60,000-70,000]	[10%-15%]
Cepsa	[30,000-40,000]	[5%-10%]	[30,000-40,000]	[5%-10%]
Others	0	0%	[40,000-50,000]	[5%-10%]
Aggregate	**[560,000-570,000]**	**100%**	**[560,000-570,000]**	**100%**

Source: Companies.

883. In 2008, Galp held [80%-85%] of the usable capacity of the import depots. Considering the obstacles to penetration and expansion and the disinvestment foreseen for this company, it is likely to maintain a medium-term capacity for the use of import depots at [70%-75%].

7.3. Secondary storage

7.3.1. Introduction

884. Secondary storage is made up of coastal depots and distribution depots.

885. The coastal and distribution depots provide supplies to nearby service stations.

886. These depots do not allow for direct imports of fuel on competitive terms either because they are not connected to means of transport for large quantities or they are connected but do not have capacity enough to take large quantities for loading or discharge (and this is normally the case of the coastal depots).

887. Areas in Portugal with secondary storage capabilities are few in number and low in capacity.

888. The reason why the storage depots are relatively small is linked to the fact that there are obstacles to penetration in the business and expansion of this type of storage, but also to the fact that some import depots, because they are near to centres of consumption (for example in Lisbon and in Matosinhos), are used for supplies direct to the service stations in their area of influence.

889. There is a series of coastal depots with connections to the ports of Leixões, Aveiro and Lisbon, as well as an important storage area in Aveiras de Cima, which is connected by pipeline (the only long-distance pipeline in Portugal) to the Sines refinery, serving the most important area of consumption of fuel for road use, the central coastal strip.

890. Following an overall description of the sites for secondary storage capacity in Portugal, there is an analysis in subsection 7.3.2 of the demand for secondary storage; in subsection 7.3.3, the supply of this type of storage, in particular the CLC storage, will be analysed; and, as a last point in subsection 7.3.4 the obstacles to expansion will be analysed in terms of making storage depots available.

7.3.2. The demand for secondary storage

891. The demand for secondary storage is related to purchases on an ex-refinery basis, and this means either imports received from means of transport carrying large amounts and placed in import depots or with purchases in bulk markets.

892. When the fuel purchased on an ex-refinery basis is in the pipeline it is important to ensure that at the other end there are distribution depots near the main centres of consumption.

893. In the same way, when the fuel coming by sea is in an import depot, and if this depot is far from the main centres of consumption of fuel for road use (normally large urban areas), it is important to reroute the fuel by pipeline or in a smaller tanker to depots near these centres of consumption.

894. Another source of demand for secondary storage is connected to the setting up of security reserves.

895. As mentioned in subsection 3.4.1, it is mandatory to set up reserves of fuel corresponding to the calculation of 90 days of bulk sales from the previous year.

896. These mandatory reserves are made up of strategic reserves, corresponding to the calculation of 30 days of sales from the previous year (i.e. 1/3 of the total), and security reserves, corresponding to the calculation of 60 days of sales from the previous year (i.e. the other 2/3).

897. The strategic reserves are managed by the EGREP, with the other 2/3 guaranteed by the companies operating in bulk sales of fuel for road use.

898. So the potential demand for secondary storage depots includes all the operators in the bulk sales of fuel for road use.

899. However, the independent operators, the supermarket chains and even EGREP itself tend generally to subcontract the process of setting up security reserves to companies that are their suppliers, and if these are not oil companies, they in turn subcontract to oil companies. This is because of the big concentration of storage depots in the hands of the oil companies and because of the obstacles to penetration and expansion of storage operations. This issue will be analysed further on.

900. Por this reason there are currently only four operators which in fact use secondary storage (although this is in many times done in the name of third

parties) and these are the four oil companies operating in Portugal (Galp, Repsol, BP and Cepsa).

901. Bearing in mind the importance and the compulsory nature of these assets, these companies (the oil companies) tend to keep them as their own property. However, their clients in the bulk business have to hold reserves as a function of their acquisitions of fuel, so the oil companies, in order to keep their clients, rent part of their reserves for the wholesalers to use as their own mandatory reserves.

902. Secondary storage is fundamental for the companies so as to ensure the deposit of their purchases on an ex-refinery basis/cargo, and thus give a boost to competition upstream at the retail stage. This will be the subject of analysis in chapter 8.

903. Various elements point to the existence of an excess of demand for secondary storage capacity of fuel for road use existing in Portugal.

904. At the end of 2008,[116] 22% of the strategic reserves of diesel managed by EGREP are not on Portuguese territory because there is not enough secondary storage for this purpose.

905. This structural shortfall is currently around [50,000-100,000]m^3. This means there is the need for a [10-20%] increase in the current secondary storage capacity for fuel for road use in Portugal (which is the equivalent of [5-10%] of the total capacity of storage for fuel for road use in Portugal).

906. The shortfall in structural capacity is likely to worsen in the coming years with the development of additional categories of fuel for road use such as biofuel.

907. Storage has to be segregated, so this increases the overall number of depots needed and this, in principle, has implications on total storage capacity.

7.3.3. The supply of secondary storage

908. On the supply side, the overall picture shows a high concentration of storage depots in the hands of a very small number of operators. However, it is important to analyse the structure of supply in each specific geographical area.

[116] Public information from EGREP as at November 2008.

In the north

909. In the north, secondary distribution is done most of all from the existing import depots (70% of the storage capacity existing in 2008, and the estimate is for 94% from 2010).

910. Indeed, the port of Leixões is very close to the main consumption centre in the north of the country (as are the import depots connected to it). This centre is the Greater Oporto metropolitan region, and the situation means that secondary distribution takes place from the import depots.

911. The secondary storage of fuel for road use is, for this reason, residual. It exists in only two complexes of coastal depots, one belonging to Repsol,[117] with a capacity of [5,000-10,000] m^3 and the other belonging to BP[118] with similar capacity.

912. In the port of Aveiro, there is currently one coastal depot of [70,000-75,000] m^3 belonging to Martifer, and mainly used by BP.

913. As previously mentioned, bearing in mind the development slated for the port of Aveiro, this storage depot should over time become an import depot.

914. So, at this moment, the secondary storage of fuel for road use in the north is mostly held by Martifer, with [80%-85%] (although with a large part of this capacity rented to BP), followed by BP [5%-10%] and Repsol [5%-10%].

915. Over time, the estimates point to secondary storage capacity being held by BP [50%-55%] and [45%-50%] by Repsol, as shown in the table below.

Table 29 – Summary of the usable capacity of secondary storage depots of fuel for road use in the north of the country in 2008 and an estimate for 2010, in m^3

	2008		**Estimativa (2010)**	
BP	[0-10,000]	[5%-10%]	[0-10,000]	[50%-55%]
Martifer	[70,000-80,000]	[80%-85%]	0	0%
Repsol	[0-10,000]	[5%-10%]	[0-10,000]	[45%-50%]
Aggregate	[80,000-90,000]	100%	[10,000-20,000]	100%

Source: Companies.

[117] Located on the southern breakwater of the port of Leixões.

[118] Located in the Parque do Real in Matosinhos.

916. Since the estimates are for 94% of the secondary distribution in the north from 2010 to be assured from import depots, the level of relative concentration in secondary storage indicated above is not in fact so high.

917. What it does reveal, for the purposes of secondary distribution, is the reality of concentration of supply in terms of the import depots analysed in the previous section.

In the south

918. In the south, most secondary distribution is also carried out from the import depots that exist in the area (57%). However, there are other depots here to ensure that secondary distribution takes on a much more relevant role (43%), and it is important to analyse this fact from a competition perspective.

919. The proximity of the ports of Lisbon and Setúbal, and of the import depots connected from them to the main centre of consumption in the south, the Greater Lisbon metropolitan region, means that an important part of secondary distribution is carried out from import depots.

920. In terms of secondary storage of fuel for road use in the south of the country, this is made up of three groups of coastal depots, one belonging to Repsol,[119] with a capacity for [20,000-30,000] m^3, one belonging to the ETC,[120] with a capacity of [45,000-55,000] m^3, and another belonging to Galp,[121] with [110,000-120,000] m^3. There is also a cluster of distribution depots in Aveiras de Cima, most of which are held by Galp, with a capacity for [220,000-230,000] m^3.

921. It is important to mention that not all the secondary storage depots are in the same competitive position because of the restrictions on tanker trucks existing in the areas around some of the facilities.

922. This is the case of the coastal depots of Porto Brandão belonging to Galp and the ETC, where restrictions to circulation mean that these depots have a very limited capacity for competitive secondary distribution.

923. Even so, they would seem to be acceptable depots for setting up mandatory reserves.

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[119] Located at the Terminal da Banática in the port of Lisbon.

[120] Located at the maritime terminal of Porto Brandão in the port of Lisbon.

[121] Located in Porto Brandão, in the port of Lisbon.

924. The most relevant secondary storage capacity in the south is owned by the CLC (CLC - Companhia Logística of fuel S.A.).

925. The CLC has a site for storage of fuel for road use in Aveiras and a pipeline linking the site to the Sines refinery. It also functions as a bonded warehouse.

926. As previously mentioned, the CLC is held by Galp (65%), BP (20%) and Repsol (15%).[122]

927. The CLC storage unit which could be used to store fuel for road use has a capacity of [225,000-250,000] m^3 and is located in Aveiras de Cima.

928. It is mainly from this storage complex that the whole of the country's central area is supplied. This includes the metropolitan region of greater Lisbon and the airport at Portela. This complex is therefore critical for the country in terms of distribution of oil-based products.

929. In order to guarantee the transport of fuel from Sines to the storage complex there is a system of transport by multiproducts pipeline linking into the Sines refinery. [123]

930. The CLC provides services exclusively to its shareholders, that is, Galp, Repsol and BP. These companies use the Aveiras complex for storage of products, including the reserves they are obliged to hold.

931. In Spain there is a company with characteristics similar to the CLC, the Compañia Logística de Hidrocarburos, S.A. (CLH).[124]

932. This organisation has a larger and more scattered network of storage depots and pipelines (see Illustration 9 below).

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[122] Apart from the Sines – Aveiras pipeline, managed by the CLC, there are short pipelines,170 but they are specific to the depots near the refineries (for example the pipelines that connect the Leça refinery to the depots of Galp, BP, Repsol and Total/Cepsa in the Parque do Real in Matosinhos, the terminals and storage depots of Esso in Trafaria, Repsol in Banática and Galp and Total in Tanquipor in Barreiro).

[123] The pipeline was installed following Dispatch no. 50/96, of 31 March, published in the Government Gazette (Diário da República), II Série, dated 03/04/96, where the public interest being served by the pipeline was recognised.

[124] The CLH has a total storage capacity for liquid fuel of around 6.5 million m^3, which corresponds to around 80% of the total storage capacity for these products in the Iberian Peninsula (*cf.* http://www.clh.es/).

Illustration 9 – Refineries and storage complexes and the network of CLH pipelines in Spain[125]

Source: CLH

933. The CLH has a broader shareholder structure than the CLC. In particular, the companies with refining capacity in Spain – Repsol, Total/Cepsa and BP – cannot hold overall more than 45% of its capital.[126]

934. No single shareholder can hold more than 25% of the equity of the CLH.[127]

935. The CLH also carries out services to a much more diversified group of operators.

936. The table below sums up the relative proportion that each operator has in the ownership of the secondary storage depots located in the south of Portugal.

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125 It should be mentioned that apart from the CLH pipeline network, there are other smaller networks, such as the Repsol pipeline that connects its refineries between Puertollano and Cartagena.

126 Acording to information from the CLH, around 85% of its capital is held by oil companies: the Canadian Enbrige (25%), Repsol (15%), Total/Cepsa (14.15%), Oman Oil (10%), Disa (which acquired the Shell operations in Spain, 10%), BP (5%) and Galp (5%) – *Cf.* http://www.clh.es/.

127 This restrition on the shareholder structure of the CLH wasimposed through Royal Decree Law no. 6/2000, of 23 June.

Table 30 – Summary of the usable capacity of secondary storage depots of fuel for road use in the south of the country in 2008 and an estimate for 2010, in m^3

	2008		2010 (Estimated)	
Galp	[340,000-350,000]	[80%-85%]	[340,000-350,000]	[80%-85%]
Repsol	[20,000-30,000]	[5%-10%]	[20,000-30,000]	[5%-10%]
ETC	[45,000-55,000]	[10%-15%]	[45,000-55,000]	[10%-15%]
Aggregate	**[410,000-420,000]**	100%	**[410,000-420,000]**	100%

Source: Companies.

937. As can be seen, in the south the level of concentration of secondary storage capacity of fuel for road use is very high.

938. Galp controls more than 80% of existing storage capacity. Galp, Repsol and BP between them hold more than 95% of the total secondary storage capacity located in the south.

939. This situation is reinforced by the high level of concentration of import depots in the south of the country, where Galp controls [75%-80%] of this storage and it uses [80%-85%] of the import depots that exist there.

7.3.4. Obstacles to penetration and expansion

940. In the same way as for import depots, there are various obstacles here related to environmental regulations, land use and restrictions on transit using tanker trucks, and all this makes it difficult to create and build up secondary distribution depot complexes for fuel.

941. In terms of secondary distribution depots, there is an additional obstacle to penetration and expansion. In order to despatch fuel to service stations, it is necessary first to get supplies by pipeline from the refineries or from small tankers.

942. Therefore, this type of depots can be located in one of two places: either near a sea port which can take smaller tankers and have a critical mass of consumption (coastal depots), or they are connected by pipeline to the refineries in Sines or Leça da Palmeira.

943. As seen in relation to import depots, the seaports nearer the large centres of consumption, Leixões and Lisbon, do not any chance of expanding their coastal depots because of the conditioning factors in these ports and the problems for tanker trucks already widely referenced.

944. In these circumstances, the development of storage depots would imply connection to the Sines and Leça da Palmeira refineries or to the pipeline between Sines and Aveiras. And any operators needing to connect their depots by pipeline to the refineries or to the pipeline between Sines and Aveiras has of necessity to use the services of Galp: (i) in the case of the refineries, because they are held by Galp directly; or (ii) in the case of the CLC, because the major shareholder here is Galp.

945. Therefore, currently, because there is no obligation on access by third parties to refinery pipelines or to the pipeline between Sines and Aveiras, nor any obligation on access to CLC depots, any operator wishing to go ahead with a secondary storage depot project will need from the start to solve the problem of connection from their depots to refinery pipelines or to the pipeline between Sines and Aveiras.

946. In relation to the Leça da Palmeira refinery, it is difficult to see whether the construction of new pipelines would be feasible, given the urban fabric of the surrounding area.

947. In this context, the access to a connection to the CLC pipeline in Aveiras is essential for the expansion of secondary storage capacity by third parties and not just by the existing shareholders.

948. The obstacles to penetration in secondary storage by third parties has meant that in recent years there has been no increase in secondary storage capacity by any independent operator.

949. In point of fact, the only independent company with secondary storage capacity of fuel for road use currently is the ETC.

950. However, in the ETC facilities there is no possibility of expanding the storage complex for fuel for road use, and even if there were, there is absolutely no possibility of using this increase in capacity for diesel and gasoline for road use because of the restrictions on tanker trucks in the proximity of the facilities.

951. It is not surprising, therefore, that the ETC facilities are mainly used at present for storage of bunker diesel even though they could be used for the storage of gasoline and diesel for road use.

952. The only increase in secondary storage capacity in recent years was at the CLC itself, as a result of the requirement for security reserves.

953. In short, if any company operating in Portugal needs access to bigger secondary storage capacity so as to be able to hold purchases made in the refineries, they would need access to the infrastructures held by the CLC or would need to build up their own capacity in areas approved for this purpose in a position where costs could be controlled.

7.4. Transport by pipeline

954. There is only one pipeline of any length in Portugal and it is owned by the CLC, a company which is controlled by Galp, BP and Repsol.

955. The pipeline takes fuel from the Sines refinery and from the import depots in the refinery.

956. Because of its importance, the CLC pipeline and the secondary storage to which it is connected in Aveiras de Cima were detailed in the previous section. This is an infrastructure where management:

- Provides indirect control (through flows) of all the storage facilities fed by the pipeline, both in terms of quality of the supply (contingency control, management of priorities, transport of specific products), and in terms of confidentiality relating to commercial dealings between operators;
- Provides the shareholders with information relating to the commercial operations of their competitors (traffic) in the bulk markets;
- Provides an incentive to maintaining the positions of the companies in the bulk and retail markets, to the extent that the management of dispatch of products in this pipeline imposes fixed and rigid market shares between operators.

7.5. Conclusions

957. One of the characteristics of the oil sector in Portugal resides in the fact that the logistical apparatus is predominantly in the hands of the oil companies.

958. There are restrictions of many types (environmental, land use and others) which make it difficult, or even impossible, for new infrastructures to be put in place.

959. This situation constitutes a restriction on the expansion of bulk and retail operations undertaken by independents.

960. In other European countries (such as Germany or the United Kingdom), there are large independent operators who have the necessary logistical apparatus on a par with the vertically integrated oil companies. As a result, these operators have a more relevant presence both at the wholesale and the retail stages.

961. Galp has a great deal of control over import depots, over secondary storage and over transport by pipeline.

962. These concentrated market structures in terms of storage may have repercussions not only in the prices of storage but also in a range of other markets, in particular the ex-refinery, the bulk and the retail markets.

963. It is important, for this reason, to see if it is possible to improve the competitive conditions of import depots, secondary storage and transport by pipeline.

964. The conditions for this are at three levels at least: obligations on access; regulations on the use of CLC infrastructures; creation of opportunities for expanding storage capacity.

965. In terms of obligations on access, it is important to regulate access to the pipeline and to CLC storage facilities so that:

- Other operators can make a connection by pipeline from any point to the CLC pipeline and the respective storage facilities (in Aveiras), and the storage complex of the domestic refineries with a view to guaranteeing their supplies;
- Third parties can gain access to the CLC in a non-discriminatory and transparent way and with commercial conditions geared to costs.[128]

966. In terms of regulating the use of the CLC infrastructure it is important:

- To see that the commercial conditions for use are structured in a non-discriminatory and transparent way, and according to principles geared to costs;[129]

[128] *Cf.* Article 24, clause 1 and clause 6 of Decree law no. 31/2006, de 15 February.

[129] *Idem.*

- To see that a dispatch code is regulated in an independent way for the pipeline between Sines and Aveiras, not based on market shares or elements that perpetuate the positions and flows of specific companies;
- To ensure that this code is flexible in the sense that it encourages rapid dispatch for discharges from large tankers (30 thousand to 60 thousand tons) from Sines to Aveiras.
- To control the relationship between the capital held by one company in the CLC and its percentage of depot and pipeline use;

967. In terms of creating opportunities for penetration and expansion of the storage business it is important:

- To ensure that the expansion plans for the liquid bulk terminal go ahead in the period slated (2009), making sure that at all times there is a guarantee that tankers of up to 40,000 tons carrying fuel for road use can discharge in the port.
- To guarantee the concession of land in the port of Aveiro with suitable areas for the storage of fuel for road use, allowing for a significant expansion of the import depots slated for here. It should be considered that the award of the concession would not be attributed to the operator with a dominant position in terms of import depots and secondary distribution in the north.
- To ensure that an international public tender is put out by the port of Sines for the concession of a suitable area (capable of taking at least 200,000m^3, and with the possibility of expansion) for import depots in Sines;
- To ensure that there is a connection by pipeline to this storage area from the depots to be built here and to the loading bays of the TGLS, fully functional and non-discriminatory in terms of the connections currently installed for the refinery depots;
- To ensure that there is a connection by pipeline for this storage area and also between these potential depots and the CLC pipeline;
- To ensure that for the purposes of this public tender for the concession it ought to be considered that no participation would be allowed from the operator with a dominant position in terms of the import depots and secondary distribution in the south of the country.

- To insist that it would be preferable if the area were ceded to a non-oil company that was a specialist in the management of import depots of fuel for road use.

8.Bulk sales operations (off the network) of gasoline and diesel for road use

8.1. Introduction

968. Bulk sales operations of gasoline and diesel for road use (also frequently known as sales "off the network" as opposed to sales on the network of service stations) consist of the sale of smaller amounts,[130] normally from the wholesaler's storage site, and are then distributed by secondary transport (normally tanker trucks) for the clients' retail outlets.

969. The main clients in bulk sales are oil companies, independent retailers (and within this group there are the supermarket chains), industrial and commercial clients (such as hauliers), and public institutions (for example, town halls, the armed forces and hospitals).

970. Bulk sales operations for gasoline and diesel for road use are different from ex-refinery/cargo sales, described in chapter 6. This distinction is common in the oil industry.

971. Ex-refinery/cargo sales, as against bulk sales, normally consist of sales of large amounts on the basis of the spot price by the refineries to other oil companies, to traders, and to major industrial clients.

972. Bulk sales involve an added value for the clients to the extent that the fuel is sold in smaller portions (normally one single tanker truck), there is a variety of destinations (points on the client's retail network), storage costs and terminal costs have been factored in and there is usually greater flexibility in payment terms.

973. As opposed to this, the special fuel tax (ISP) is automatically reflected in the wholesale price for the purchaser (there being no suspension), whereas in ex-refinery/cargo sales the ISP is not paid at the moment of purchase (being temporarily exempt from payment).

974. The bulk markets are important sources of supply for those operating in retail sales of fuel in Portugal, and this means that competition at this level is an important factor for competition at the retail level.

[130] Normally 20 to 30 tons each time.

975. Further to this, there is an analysis in section 8.2 of the conditions which underlie the demand for and supply of bulk sales of gasoline.

976. In section 8.3 there is a similar analysis on bulk sales of diesel for road use.

977. In section 8.4 there is an analysis of how bulk prices are reached, both for diesel and for gasoline, and as a last point, in section 8.5 conclusions are drawn.

8.2. Bulk sales of gasoline

8.2.1. The demand for gasoline in bulk

978. Generally speaking, the clients of bulk sales of gasoline do not have their own secondary storage depots. Instead, they fill their own tanker trucks, or those they rent, at their supplier's storage facilities.

979. In some cases, for instance in the purchases made by the supermarkets (though not only), bulk sales also involve transport to the facilities of the purchaser (and there may be more than one).

980. The type of clients that uses bulk sales of gasoline has relatively varied characteristics.

981. The oil companies make up one group of clients for bulk sales.

982. The oil companies normally ensure their purchases on an ex-refinery basis/cargo. However, they do not have uniform coverage in terms of capacity for storage and then secondary distribution right across Portugal.

983. So they minimise their costs with secondary transport of fuel by resorting to purchases in bulk in places where it would cost more to use their own more distant storage depots.

984. For this reason, demand at bulk sales level may have regional characteristics (there may be differences, for instance, between the north and the south of the country).

985. In fact, the areas of influence of the existing secondary distribution depots also point to this feature.

986. A second group of clients for bulk sales is made up of operators that acquire gasoline for retail sales in their independent network (supermarket chains and independent retailers).

987. Within this group, some independents, apart from being purchasers in the bulk markets, also sell their products in the bulk market.

988. A third group of clients in bulk sales is made up of major end users who do not acquire fuel in the retail network. These are, for instance, industrial and commercial companies (such as hauliers), and public institutions (for example, town halls, the armed forces and hospitals).

989. The bargaining power of each purchaser depends fundamentally on the quantity acquired.

990. In general, purchases in the bulk markets are governed by written contracts where a form of indexation is set down for the price over the period of the contract, although some supermarkets may have centralised purchasing systems and may make auctions on a weekly basis for their acquisitions.

8.2.2. The supply of gasoline in bulk

991. In 2007 and 2008, the supply of gasoline in bulk was guaranteed fundamentally by the oil companies, with a relative proportion of more than 90% of the total.

Table 31 – Relative proportion of each operator in the bulk sales of gasoline in 2007 and 2008

	2007	**2008**[131]
Galp	[50%-55%]	[45%-50%]
BP	[15%-20%]	[20%-25%]
Repsol	[15%-20%]	[20%-25%]
Cepsa/Total	[5%-10%]	[0%-5%]
Esso	[0%-5%]	-
Agip	[0%-5%]	-
Others	[5%-10%]	[5%-10%]
Aggregate	**100%**	**100%**

Source: Companies.

992. Galp made the most bulk sales of gasoline with [45%-50%] of the total in 2008. BP was second, with ([20%-25%]), and Repsol was third ([20%-25%]).

993. During 2008, the independent operators accounted for a relative proportion of [5%-10%].

[131] The market shares of Agip and Esso for 2008 were integrated into the figures for the Galp Group.

994. In Portugal, unlike other countries (e.g., Great Britain and France), there are no major independent operators at this stage of the value chain.

995. There are various reasons for this situation. In the first place, there is the fact that the storage capacity for imports and secondary storage is mostly in the hands of the oil companies; in the second place, there is the small size of each of the independent operators and supermarkets in retail sales of fuel; and in the third place, there are the obstacles to penetration and expansion of the businesses involved: making storage depots for fuel for road use available; and retail sales.

8.2.3. Obstacles to penetration and expansion

996. The factors that contribute to the large market share of Galp in the bulk market for gasoline, both in 2007 and in 2008, are related to:

- The comparative advantage given by the location of their two refineries, the position held by the company in import and secondary storage, and little likelihood of new penetration in refining in Portugal;
- The fact that the bulk market is not supplied by imports made by independent operators.

997. Let us analyse each of these factors separately.

998. The advantages given by the location of the domestic refineries and little likelihood of new penetration in refining in Portugal mean that the vendors in the bulk markets are mostly supplied from the two refineries of Galp.

999. Moreover, the independents have not been able to build up a relevant role in bulk supplies because of the problems they face in getting access to the infrastructures necessary to import on competitive terms (access to ports, to import storage and to pipelines).

1000. Independent retailers would probably be reluctant to commit themselves to purchasing large volumes of fuel from an independent importer for a long period if the latter could not ensure stable supplies (either in terms of the supply contracts, or in terms of the facilities).

1001. Moreover, potential importers are not going to commit themselves to acquiring large volumes without the guarantee that they can channel the fuel to the markets and without the financial capacity and proper organisation.

1002. It is therefore important to encourage the development of conditions for independent operators to reach a size that enables them to compete effectively in this market.[132]

8.3. Bulk sales of diesel for road use

8.3.1. Demand for diesel for road use available in bulk

1003. Demand for diesel in bulk has similar features in terms of the type of operators as the demand for gasoline, and therefore most of the points in subsection 8.2.1. above are applicable.

1004. Even so, it is important to highlight some relevant differences in terms of the demand for diesel in bulk.

1005. In the first place, one important group of clients in the bulk sales of diesel for road use is made up of hauliers, whose fleets are powered by diesel.

1006. In the second place, in geographical terms there seem to be more significant differences in the bulk sales of diesel than for gasoline.

1007. For example, the bulk sales of diesel seem to be more important in the south (around 60%) while the bulk sales of gasoline are more evenly spread (52% in the south).

8.3.2. Bulk supply of diesel for road use

1008. In 2007 and 2008, bulk supply of diesel for road use was fundamentally guaranteed by the oil companies, which accounted for more than 95% of the total.

[132] For example, "Report on the competitive conditions of non-integrated independent companies in the motor fuel sector", Case 37.987, September 2001, DG COMP/UE, paragraph 278 the ss.

Table 32 – Relative proportion of each operator in bulk sales of diesel for road use in 2007 and 2008

	2007	2008
Galp	[35%-40%]	[35%-40%]
BP	[20%-25%]	[20%-25%]
Repsol	[20%-25%]	[20%-25%]
Cepsa/Total	[10%-15%]	[5%-10%]
Esso	[0%-5%	-
Agip	[0%-5%]	-
Others	[0%-5%]	[0%-5%]
Aggregate	**100%**	**100%**

Source: Companies.

1009. Galp had the biggest proportion of the bulk sales of diesel for road use, their market share being [35%-40%] of the total in 2008. BP was the next, with ([20%-25%]), and Repsol was the third ([20%-25%]).

1010. Independent operators had less than 5%.

8.3.3. Conditioning factors that militate against penetration and expansion of bulk sales of diesel for road use

1011. The obstacles to penetration and expansion of operations in the bulk sales of diesel are similar to those for gasoline, and therefore will not be detailed again in this subsection.

8.4. Price structure in the bulk sales of gasoline and diesel for road use

1012. It is possible to find at least three types of price structure for bulk sales in Portugal.

1013. In the first type, there is a contract where the bulk sales price is defined on the basis of a retail price used as a reference or recommended by the oil company, with a discount included.

1014. This type of price structure, when used with independent retailers, may mean that the reference price and the retail price are not different.

1015. This situation becomes more relevant if the implied margins in the sale are relatively small.

1016. There is a second type of contract where the price for a bulk purchase is calculated by means of a formula using an indexation similar to that for the ex-refinery price, that is, a formula where the base price for the refined product is reached by reference to international quotations (Platts), to which is added a range of spreads related to the charges for storage, primary transport, wastage, the logistics of filling, insurance, the wholesale profit margin, the special fuel tax (ISP), IVA, and other items.

1017. The most important components in the price are of course the figures deriving from the international quotations and from tax.

1018. There is also a third type of contract, not as common as the first two, with a written agreement between purchaser and vendor, and a price set for each transaction.

1019. As a general rule, bulk prices vary according to geography, a fact that reflects logistical differences related, for example, to storage capacity.

1020. There are at times minimum amounts defined for purchase and in some cases maximum amounts (normally because of the capacity of the premises available).

8.5. Conclusions

1021. Demand for bulk purchases of gasoline and diesel is not as small-scale and dispersed as demand in the retail market. So on the demand side, it is possible to find oil companies, independent operators, supermarkets and hauliers as the major purchasers.

1022. On the supply side, the bulk markets in gasoline and diesel are characterised by a high level of concentration.

1023. In 2008, the four oil companies operating in Portugal accounted for more than 90% of the sales of gasoline and 95% of the sales of diesel at this stage of the value chain.

1024. In order to penetrate these markets in a consistent way, it is desirable to ensure a supply on competitive terms, and access to storage and filling infrastructures with sufficient geographical cover, and this demands financial robustness and a suitable organisational structure.

1025. For those oil companies operating in the bulk markets but without refining operations in Portugal, access to competitive conditions for supply would seem to be relatively secure in terms of ex-refinery purchases. It is not,

however, possible to ignore the obstacles facing construction of new storage depots, or the enlargement of those that exist, along with difficulties in terms of the seaports. These points have been analysed in subsection 6.3.1.

1026. For independent operators, penetration and expansion in the bulk gasoline and diesel market seems to be more complex, since they have competitive disadvantages because of the small volume of their retail sales. They also of course face the obstacles that other oil companies face (except for the domestic refining operation). They also carry less weight in the logistics infrastructures and are not so attractive as partners in agreements with supermarket chains.

1027. It is therefore important:

- To foster competitive conditions for storage and access in a way that does not discriminate and is transparent (this recommendation is given more detailed expression in section 7.5);
- To foster the development of retail sales of fuel by supermarkets, so that they come to reach critical mass (this recommendation is given more detailed expression in section 9.8);
- To free the fixing of bulk prices from those indexed to retail prices. Certain practices should be eliminated - the use of reference prices and/or recommended prices as a reference for calculating discounts, bonuses, and retail margins and so on in the definition of prices for sale to clients and/or wholesalers.

9. Operations and retail sales in the network of liquid fuel (gasoline and diesel for road use)

9.1. Introduction

1028. Retail sales of fuel include sales of fuel for road use (gasoline and diesel[133]) to motorists at service stations, with the oil companies' brand or without, that is, in the whole network of service stations (this is why many times these sales are called "network sales").

1029. In retail sales of fuel for road use there is a strong local element that boosts competition, to the extent that drivers tend to fill up in the service stations near their home and/or place of work.

1030. Indeed, on the demand side, being able to choose between neighbouring service stations will always be conditioned by the costs of getting around (in fuel and wear and tear on the car), and the time taken.

1031. For this reason it is common practice among oil companies to recommend different prices depending on the site of the outlet.

1032. In the same way, it is common practice for the oil companies to monitor prices in the service stations around each one of their own retail outlets.

1033. Evidence exists therefore that competition in the retail sales of fuel is most keenly felt at a local level.

1034. However, bearing in mind the very large number of local markets that would have to be analysed and the purpose of this report, the Portuguese Competition Authority considered that the analysis of each of these markets individually would not add anything to this report, or justify the resources, time and costs for the companies in supplying the information.

1035. The analysis in this section, therefore, will be from a nationwide perspective, though whenever possible information will be provided relating to more local or at least more regional levels.

[133] Although there is no possibility on the demand side for substituition between these products, to the extent that drivers thave to use the correct type of fuel for their vehicle, there is considerable room for interchange on the supply side, since different types of fuel are sold at the same points of sales so as to satisfy the maximum numberof customers.

1036. As already stated in section 4.2, retail sales of fuel in Portugal in 2008 generated around 7 thousand million euros (around 2.4 thousand million for gasoline and 4.6 thousand million for diesel).

1037. Out of this turnover, the added value from retail sales of fuel (including retail profit margin and costs related with retail operations) represented 599 million euros (around 184 million euros for gasoline and 415 million euros for diesel).

1038. Retail sales of fuel can be split into sales on the highways and sales off the highways.

1039. Retail sales of fuel on the highways will be analysed in chapter 10.

1040. This section is set out in the following way.

1041. In section 9.2, the characteristics of demand in retail sales of fuel for road use will be analysed; in section 9.3, the structure of supply, the strategy of each operator and their relative proportion in the supply will be analysed; and in section 9.4, the form of penetration and the obstacles to expansion and closing a business in retail sales of fuel will be detailed.

1042. In section 9.5, there will be an assessment of the differences in the pricing policies of different operators in this stage of the value chain, with particular focus on the pricing policies of the oil companies, the independent operators and the supermarket chains.

1043. Then, in section 9.6, there will be an exhaustive analysis of the changes in the retail prices of fuel in Portugal. This will include for instance:

- Analysis of the changes in the average retail price in mainland Portugal (the average retail price);
- Comparisons between the average retail price in different regions in Portugal;
- International comparisons and average retail price in the EU27;
- Comparisons of the average retail prices before tax in Portugal (pre-tax prices);
- Comparisons of the changes in the differential between domestic retail prices and the bulk prices used as an international reference;
- International comparisons of pre-tax prices in the EU27;
- Analysis of changes in the differential between pre-tax prices and the EU;

- Analysis of changes in the differential between pre-tax prices in Portugal and Spain;
- Analysis of changes in the differential with the tax effect cancelled out and comparison with best practices.

1044. In section 9.7, there will be an analysis of profitability in retail sales of fuel.

1045. As a last point, in section 9.8, conclusions will be drawn on the analysis carried out.

9.2. Demand for liquid fuel for road use

1046. Demand for liquid fuel at retail levels is made up of a large number of individual drivers. It is therefore dispersed and atomized.

1047. It is also a type of demand that is not very sensitive to prices (it is relatively inelastic[134]). Retraction in demand only happens when there are big changes in prices such as those that occurred in 2008.

1048. In fact, a number of surveys have shown that customers are more sensitive to questions of location and the quality of service than they are to the price of fuel.

1049. So, although the average pump price for 95-octane gasoline rose by 5.1% between 2007 and 2008 and diesel for road use by 16.6% in the same period, the aggregate demand for fuel for road use at retail level fell by no more than 3%, as can be seen in the tables below.

Table 33 – Retail sales of fuel for road use in thousands of millions of litres in 2007 and 2008

	2007	2008	Change 2007 – 2008
95-octane gasoline	1.85	1.70	-7.9%
Diesel for road use	3.71	3.69	-0,6%
Total	**5.56**	**5.39**	**-3.0%**

Source: Companies.
Includes: super additive gasoline; 98-octane gasoline; 95-octane gasoline; diesel for road use.

[134] According to a study in 2001, Working paper no. 24 of what was then General Directorate for Studies and Forecasting of the Ministry of Finance, writen by Jorge Manuel C. de Oliveira, entitled "Demand for Oil-based products in Portugal: An Empirical Approach", the estimated values for the demand-price elasticity of gasoline were -0,43 and -0,89 and in the short and the long term and for diesel they were -0,07 and de -0,17 also in the short and the long term.

Table 34 – Changes in the average retail price of 95-octane gasoline and of diesel for road use in 2007 a 2008, in euros per litre

	2007	2008	Change 2007 – 2008
95-octane gasoline	1.320	1.387	5,1%
Diesel for road use	1.080	1.260	16.6%

Source: European Commission.

1050. In short, bearing in mind the characteristics of the structure of retail demand for fuel, it is fundamental to ensure competition among the various agents operating on the supply side.

1051. On the demand side, it is important also to highlight a structural change that has become evident over the past decade and has its origins in a factor that is fiscal in nature.

1052. Portugal, like most other European countries, has witnessed what is commonly known as the phenomenon of "dieselisation". In other words, the domestic car stock is becoming ever more made up of vehicles powered by diesel and fewer powered by gasoline.

1053. This situation stems in large part from the effect of the special fuel tax (ISP) on the structure of consumption.

1054. It comes down to the fact that the pump price of diesel is lower than gasoline and this has led to bigger demand.

1055. In recent years, the ex-refinery and bulk prices of gasoline have been lower than those of diesel but because the tax on gasoline has been higher than for diesel, the pump price of gasoline has been higher.

1056. This situation, where the pump price of gasoline is higher than diesel, was at the root of the process of dieselisation. It has produced consequences on two levels at least.

1057. On the one hand, it has caused a fall in the consumption of gasoline (down 7.9% from 2007 to 2008) over and against an increase in the consumption of diesel (which in fact also fell in the same period though not for this reason but because of the 0.8% increase in pump prices).

1058. Moreover, the shift led to a shortfall in diesel refining capacity and this led to two things. Firstly, in the short term, there was an increase in the price of

diesel that was higher than the increase for gasoline (from 2007 to 2008 the price of 95-octane gasoline increased by 5.1% whereas diesel increased by 16.6%); and secondly, substantial investments in refining facilities (which also includes the investment in reconversion planned by Galp for the country's refineries).

1059. This situation also occurred in other European countries.

9.3. Supply of liquid fuel for road use

1060. On the supply side, there are three types of agents with distinct characteristics operating in the network of retail sales of gasoline and diesel:

- Vertically integrated oil companies, which normally operate at all stages of the value chain from refining to bulk sales and to retail;
- Independent retailers, that is, operators that are in retail sales, exclusively or almost so, and they purchase fuel from oil companies vertically integrated in the bulk markets;
- Supermarkets/hypermarkets, which are also independent retailers, but they have certain characteristics that mark them out from the other independent retailers, to the extent that:
    - o They are owned by large food retailing chains, with the service stations normally located near their large commercial premises (frequently in the parking lot);
    - o Normally, unlike the other independent retailers, retail sales of fuel for these operators is an accessory to their core business, which is distribution of food and beverages. It is an additional service that they provide for their customers as a way to attracting them to their retail park;
    - o In general, the volume of sales per service station (considerably more than a traditional outlet) makes it possible for them to get economies of scale in terms of the management of the service station and thus be able to sell at lower prices;
    - o As a last point, these operators normally set up near big population centres and keep away from sparsely populated areas.

1061. The relative proportion of each of the groups of operators in retail sales in the network in 2007 and 2008 is detailed in the table below:

Table 35 – Relative proportion of each of the groups of operators in retail sales in the network in 2007 and 2008, volume figures

	2007	2008
Galp	[35%-45%]	[35%-45%]
Repsol	[10%-20%]	[10%-20%]
BP	[10%-20%]	[10%-20%]
Cepsa/Total	[5%-10%]	[5%-10%]
Agip	[0%-5%]	-----
Esso	[0%-5%]	-----
Independents	7.3%	7.7%
Supermarkets	9.0%	12.0%
Aggregate	**100%**	**100%**

Source: Companies.
(*) Taking independents and supermarkets as two aggregates.

1062. In 2008, after acquiring the operations of Agip and Esso in Portugal, Galp then held [35%-45%] of retail sales in the network in mainland Portugal.

1063. Repsol was the second biggest company in retail sales in 2007 and 2008 ([10%-20%]).

1064. BP was the third biggest company in retail sales of fuel, with a relative proportion of [10%-20%] in 2008.

1065. Cepsa, the fourth biggest, accounted for [5%-10%] sales in 2008.

1066. Together, the four oil companies operating in Portugal accounted for around 80% of the sales of fuel in the network of service stations in 2008. This is a high level of concentration.[135]

1067. In the coming years, therefore, it would seem unlikely that there will be an increase in the level of concentration through acquisition in this part of the chain, given the high levels of concentration that there are already.

1068. The other 20% of retail sales of fuel in 2008 was split between the supermarket chains (12%) and the independent operators (7.7%).

[135] IHH maximum estimated as 2253 in 2007 and as 2387 in 2008.

1069. From 2007 to 2008 there was a 3 p.p. increase recorded in the market share of the supermarkets. This rise in the relative proportion of the supermarkets came basically from loss of market share among the four main oil companies.[136]

1070. The independent operators also increased market share from 2007 to 2008.

1071. In the following paragraphs, the way each of the different groups operate - the oil companies, the independents and the supermarkets - will be described in more detail.

Oil companies

1072. At the end of 2008, there were four oil companies operating in the retail market in Portugal: Galp, Repsol, BP and Cepsa (including Total, the Cepsa brand).

1073. Together, the oil companies accounted for [80%-85%] of the sales of fuel for road use in the networks of service stations in mainland Portugal in 2008.

1074. Not all the service stations belonging to a network with the same brand have the same characteristics.

1075. The service stations of the vertically integrated oil companies fall into three categories[137]:

- Service stations of the COCO ("*Company Owned Company Operated*") type, that is, service stations where ownership and operations are in the hands of the oil company. In these cases, the service stations are run by the company or by one of its subsidiaries, using employees of the company. The oil company that supplies the fuel is the owner of the fuel and the outlet and fixes pump prices directly.
- Service stations of the CODO ("*Company Owned Dealer Operated*") type, that is, service stations owned by the oil company but where the running is in the hands of a third party (dealer and/or agent). In this case the operator purchases stocks of fuel on an exclusive basis from the oil company of the brand, receives a commission/margin and pays a fee for the concession.

[136] It should be remembered that the rise in the market share for Galp from 2007 to 2008 was due to the acquisitions of the Agip and Esso networks. If these were left out of the equation, the market share of Galp would have fallen from 2007 to 2008.

[137] These categories are the most representative, though there are others, and the list could be broken down into additional subcategories.

- Service stations of the DODO ("*Dealer Owned Dealer Operated*") type, where the outlet is run on behalf of a third party (that is, service stations owned and run by a third party). The operator purchases stocks of fuel on an exclusive basis from the oil company of the brand and receives a bulk margin.

1076. With service stations of the CODO and DODO type, the operation is run by wholesalers connected to the oil company, and various types of contracts are in use (operating concession, exclusive purchase, resale of fuel and so on).

1077. Depending on the type of contract, the outlet and/or the equipment connected to the supply may or may not be the oil company's.

1078. In the same way, as far as fuel is concerned, there are sale contracts whereby the fuel sold at the outlet is acquired by the interested party from the company, and it is his property from that moment, or contracts on a consignment basis (the fuel is the property of the oil company up to the act of sale to the public).

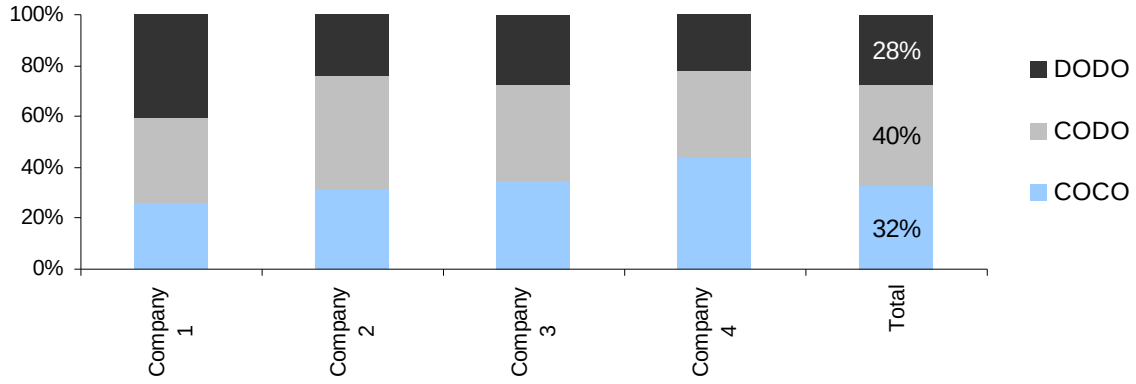
1079. These contracts have specific clauses, depending on the type, but in general, they all have stipulations relating to: exclusive purchase, the form of payment for fuel, the schedule of supply to the outlet, opening hours, whether or not bank cards and company cards are accepted, financial stipulations (resale margins, commissions, bonuses, anything set off against the operating rights, joint participation in advertising campaigns and so on), retail prices, duration of the contract, and renewal terms.

1080. There are contracts that stipulate minimum annual quantities, and financial input from the oil company.

1081. In 2008, in the network of the four oil companies operating in Portugal, on average, 32% of the retail sales was made through service stations of the COCO type, 40% of the CODO type and 28% of the DODO type.

1082. The differences at this level between the four oil companies were not very significant, with one exception, as can be seen in the chart below.

Chart 54 – Relative proportion of COCO, CODO and DODO in the quantities sold in the network of the four oil companies operating in Portugal in 2008



Source: Companies.

1083. In the service stations of the CODO and DODO type, the wholesalers can, in principle, define the prices for sale of fuel depending, however, on the contract terms (for example, sale contracts or on consignment), but in practice the oil companies have control of the pricing policy in these outlets, not only through the mechanisms of financial compensation (often known as "price supporting mechanisms"), but also through physical and computer mechanisms to define pump prices (in particular when the supply pumps are owned by the oil companies).

1084. The specific price supporting contracts vary from company to company. The systems do, however, have certain common elements.

1085. Each oil company defines an internal reference price at which the retailer purchases the fuel (plus transport and other costs).

1086. Each oil company also fixes a margin for the retailer.

1087. The oil company monitors the prices of competitors in the retail market and shares with their licencee the discount that the company decides to offer so as to match the special offers of their competitors during periods of discounts that they are making. This sharing procedure makes it possible for the licencee to keep up a commercial margin.

1088. Price support tends to be given in the form of a discount at the end of a specific period.

1089. It is the oil company that decides at any time whether the price support will be maintained or not and informs the retailer of the decision.

1090. Apart from this, in the case of CODO and DODO, and according to the contract clauses that bind them to the oil company, the reseller tends fix the prices for the sale of fuel at the same level as the maximum prices recommended by the oil company.

1091. In practice, these contracts are relevant for the oil companies because they allow them to define indirectly the prices in the CODO and DODO service stations with their brand and to match the prices of a competitor over any discount periods.

1092. Therefore, regardless of the type of service stations, the oil companies tend to exert control within the network of their brand, either directly or indirectly, and this control covers pricing, special offers and commercial strategy of the operators of these service stations.

Independents

1093. At the end of 2008, the main independent operators were Petrin (the Avia brand), Cipol, Azória, Alves Bandeira, Freitas, Ilídio Mota, Gaspe, Lubridão, Petroibérica, Sopor and Prio, though there were others of smaller size.

1094. Together, the independent operators accounted for 7.7% of the sales of fuel for road use in the networks of service stations in mainland Portugal in 2008, with just over 500 service stations.

1095. Therefore, at this moment the independent operators have a role of little significance on the supply side.

1096. Many of them are also located in regions with smaller population density and where the oil companies are less interested because of the smaller volume of sales per outlet.

1097. Retail sales for independent operators are conditioned by the constraints mentioned already relating to import depots (as analysed in section 7.2) and distribution (as analysed in section 7.3).

1098. These companies get their supplies from bulk markets for the sale of gasoline and diesel. These markets are controlled by the oil companies operating in retail sales, so the oil companies are simultaneously suppliers and competitors of these operators in retail sales.

1099. One independent operator has, however, recently moved in. This is Prio (the Martifer Group) and they have built storage depots near the port of Aveiro.

1100. If the projects to extend and develop this seaport materialise (see the analysis detailed in subsection 6.3.2.2.2), this operator could have a more important role in the retail sales of fuel for road use, to the extent that they would be in a position to secure ex-refinery prices/cargo close to those obtained by the other oil companies.

1101. At this moment, beating in mind the obstacles that there are in terms of the infrastructures in the port of Aveiro and the few service stations held by this operator (five),[138] the characteristics of Prio do not mark it out as sufficiently different from the other independent operators.

Supermarkets/Hypermarkets

1102. In Portugal, at the end of 2008, the main retail distribution chains (from here on called "supermarkets"[139]) operating in retail sales of fuel for the country's road network belong to a number of groups: Auchan (the Jumbo brand), Jerónimo Martins (the Pingo Doce, Feira Nova and Recheio brands), Modelo Continente, Leclerc, and ITMI (the Intermarché and Ecomarché brands).

1103. Penetration in retail sales by the service stations managed by supermarket chains has only been possible since 2005, when there was a revision of the legal framework following a recommendation from the Portuguese Competition Authority.

1104. Indeed, after the last stage of price liberalisation for fuel on 1 January 2004, the Portuguese Competition Authority identified, among other obstacles, administrative, legal and structural constraints to penetration in the market of fuel that hinder competition in the sector.

1105. To this end, a Portuguese Competition Authority issued Recommendation no. 3/2004 (see subsection 1.1.2.2), where it expressed the opinion that the regulation then in force (Executive order no. 131/2002, of 9 February) created problems of unfair treatment on access to operations involving the sale of fuel.

1106. This Executive order places very stringent rules on opening a service station, and bans them in "sensitive areas". These are defined as "area(s) which because of their size or use may cause hindrances or dangers to circulation,

[138] Prio has service stations in partnership with the Jerónimo Martins Group as well as its own.

[139] For the sake of simplicity, the word supermarket is used for large retail chains that also include hypermarkets and cash and carry operators such as Makro and Recheio).

such as parking lots near or adjacent to (…) retail parks, shopping malls and the like, including exclusive access to all the structures mentioned above."

1107. The Portuguese Competition Authority made a Recommendation that the Executive order be changed, in order to boost competition, create more efficient markets and pursue what is of the greatest benefit for consumers. This Recommendation stated "that all those stipulations that hinder unfettered competition should be eliminated because they make it impossible for certain categories of operators, specifically those with large retail parks, to gain access to the market."

1108. There followed a Resolution in the Council of Ministers, no. 63/2003, of 13 March, a Resolution in the Council of Ministers, no. 171/2004, of 29 November, which, along the lines of the recommendations of the Portuguese Competition Authority, led the ministry for economic activities and labour (Ministério das Actividades Económicas e do Trabalho) to issue Executive order no. 362/2005, of 4 April, with a more flexible solution for setting up service stations "where they do not jeopardise the safety of people and security of belongings" (see subsection 1.2.6).

1109. Specifically, it opted to "allow service stations to be built in sensitive areas, with the licensing authority stipulating an accepted minimum distance." (See Executive order no. 362/2005, of 4 April.)

1110. To this end, Executive order no. 362/2005 led to more flexibility because it removed administrative and legal obstacles standing in the way of increased competition in the retail fuel sales sector, and in particular by making it feasible for the operators of large retail parks to gain access to the market. This is a basic requirement for price discipline in retail sales, with clear benefits for the consumer.

1111. There are currently just over 150 service stations with brands of supermarket chains in mainland Portugal, accounting for 12% of the sales of fuel in 2008.

1112. The supermarkets are in the "mass market" segment, and their investment in service stations is a way of attracting customers to their retail spaces, to generate business for their retail stores and in this way boost their profits in an integrated way.

1113. The commercial strategy of the service stations managed by supermarkets differs from that of the service stations managed by the main oil companies and independent operators.

1114. The supermarkets base their strategy on a policy of low prices and low costs.

1115. Indeed, the supermarket chains benefit from economies of scale, given the large volumes of fuel that they sell in each outlet, and this makes it possible for them to smooth out their fixed payroll costs and capital. They also benefit from economies of scope (cost sharing with other operators in the retail park, access and so on).

1116. Apart from this, these service stations tend to cut the level of service to a minimum and function very frequently on a self-service basis and with automatic pre-payment. They also generally market a narrower range of fuels.

1117. The oil companies operating in Portugal prefer to charge higher prices, justifying this with reference to factors such as the brand, advertising, the level of service, the variety of products (premium products, for example,) and a guarantee of supply.

1118. The service stations owned by the supermarkets get their supplies from the bulk markets for gasoline and diesel, purchasing fundamentally from the oil companies (for example, Galp, Repsol, BP), though occasionally in smaller amounts from independent operators.

1119. The experience in various European countries, among them France and the United Kingdom, shows that the markets where the operators of service stations in supermarkets have a significant presence in retail sales of fuel tend to be more competitive. France and the United Kingdom are among the European countries in Europe with the lowest average retail prices before tax.

1120. Indeed, in France, more than 50% of the fuel for road use is sold in supermarket service stations.

1121. In the United Kingdom, there has been big competition on prices involving the oil companies and the supermarkets since the early 1990s. At the end of the 90s, this led to a reduction in the difference between inter-brand prices among the oil companies to a maximum of one penny per litre.[140] Between

[140] Approximately 1,08 cents (euro) at prices of 30/03/2008 – Study by Datamonitor (2007), *The Penetration and Performance of Supermarket Sites in European Fuel Retailing*, London.

2003 and 2005, the differential in prices among operators in the United Kingdom varied between 2% and 4%.

1122. In Spain, the government acted on the notion of fostering competition in the market in goods and services by decreeing that large commercial establishments should have at least one outlet for the supply of fuel for road use, notwithstanding the duty to safeguard compliance with all applicable standards of safety and security.[141]

1123. In the case of the USA, in 2005, the supermarkets and hypermarkets had a market share of 3% of the total number of service stations and retail sales of fuel but a market share of 15% in the volume of domestic sales of gasoline, charging prices between 7 and 10 cents (USD) per gallon less than the oil companies.[142]

9.4. Obstacles to penetration and expansion and to leaving the market

Main conditioning factors to penetration and expansion

1124. In the long term, and looking exclusively at competition issues, it is only possible for an operator with competitive pricing strategies to penetrate and expand in retail sales of fuels if at the minimum two conditions are fulfilled:

- A brand which consumers trust;
- Access to the best price terms for the purchase of fuel for road use.

1125. In terms of the first element, if ever consumers do not trust the brand, this could be of itself a sufficiently powerful factor for this operator alone not to represent a relevant competitive pressure on other operators.

1126. The capacity to overcome the brand factor differs in line with the profile of the operator:

- An international oil company can gain an advantage at this level because it benefits from investment in advertising with a global reach and with an

[141] See Royal Decree Law no. 6/2000, of 23 June.

[142] A gallon is equivalent to 3.785 litres, which means a discount of between 1.4 and 2 cents (euro) per litre at the exchange rate of 30/03/2008.

impact on domestic consumers exposed directly or indirectly to this advertising;

- The independent_operators find it difficult building a brand that consumers trust, to the extent that they do not benefit from the visibility that the oil companies and even the supermarkets have;
- The supermarkets, when they invest in advertising, are not only promoting their brand for the purposes of selling their foodstuff but the whole range of products they have, including fuel, and therefore they have a relative advantage in overcoming this barrier to penetration.

1127. In terms of the second element, it is only possible for an operator to have a competitive strategy in retail sales, in terms of the price, if it is open to negotiate the best terms for purchasing the products.

1128. Bearing in mind the characteristics of this sector in Portugal, such a situation is only possible if this operator manages to acquire the fuel on competitive terms, and avoid the problems of the storage and bulk markets (as analysed in sections 7.2, 7.3 and chapter 8).

1129. Even though an operator wants to build up storage capacity of his own, either in terms of import depots or of distribution, there are obstacles in the way at various levels:

- The lack of space for building import depots, as a result of environmental constraints; logistical constraints; and the fact that suitable areas to build import depots or storage are already occupied;
- Congestion at the relevant docking points, making it difficult to discharge fuel for road use on competitive terms;
- The minimum critical size for importing fuel on terms that makes it profitable.

1130. The two first elements mentioned have been explained in detail in subsections 6.3.2.2.2 and 6.3.2.2.3 and in chapter 7.

1131. As for the need to reach critical mass, the obstacles at this level are similar for oil companies, independent operators and supermarkets.

1132. The time taken by official bodies for licencing new service stations implies that any penetration by new operators could only happen, in the best of circumstances, after two to three years following the decision to allow a new service station to be opened. This is in large measure due to the time that

public bodies take to award licences, above all the town councils (cf. Table 36).

Table 36: Stages and periods associated with opening a service station

Finding and negotiating for the land and formalising acquisition	[4-8] months
Making the project needed for the licencing	[1-2] months
Licencing procedures in the official bodies	[12-30] months
Selection of contractor and building works	[4-10] months
Award of operating licence	[1-2] month
TOTAL TIME	**[23-36] months**

Source: Companies.

1133. A new player, therefore, would have to wait a number of years before being in a position to apply more aggressive pricing strategies.

1134. There is a system of special offers between oil companies and supermarkets, in a form of cross-selling, with the concession of discounts on the purchase of fuel to users of supermarkets, and vice-versa, which might have become a disincentive to supermarkets to develop their own autonomous network of service stations.

Regulatory obstacles to penetration

1135. There are a number of regulatory obstacles in the way of penetrating this market, above all in terms of the process of licensing a service station that is open to the public. These have been detailed in subsection 3.2.6.

1136. Recently, legislation has come into force with the aim of simplifying the administrative procedures for licencing service stations, but it is not possible yet for the Portuguese Competition Authority to assess, nor for operators in the market of retail distribution of fuel to give an opinion of the impact of the amendments introduced in the above-mentioned Decree law no. 195/2008, of 6 October. This goes, among other things, for the issue of the time it takes to open a new service station.

Regulatory obstacles in the way of leaving the market

1137. The regulations on leaving the market are described in subsection 1.2.6.

1138. Any operator who wishes to withdraw from the market will have to dispose of all service stations and the costs are low. In the case of a sale, or renting out or withdrawing from the business and passing it on to a third party, all that is needed is a document drawn up to state what has happened to the

operating licence in question.[143] If there is nobody interested in acquiring the operation, withdrawing from the market implies closure of the outlet.

1139. Currently, this closure is a matter of a straightforward communication to the authority responsible for the licencing of the building and running of the premises. The document must be accompanied by a request that the operating licence be cancelled.[144] The law stipulates in addition that the site be returned to a state that guarantees the safety of people and respect for the environment. The body responsible for the licence can require all equipment to be removed. The condition that the site be returned to a state that guarantees the safety of people and respect for the environment may imply decontamination of the soil if there has been any spillage and the fuel deposits to be filled with inert matter.[145]

1140. An analysis of the two types of regulatory barriers shows that current legislation means that there are barriers to both entry and withdrawal, the latter in the case of closure.

9.5. Differences in pricing policies between operators

9.5.1. The pricing policy of the oil companies (recommended pump prices - PVPR)

1141. The pricing policy of the four oil companies operating in Portugal (Galp[146], Repsol, BP and Cepsa) is substantially much the same.

1142. These companies generally pass on information to each other on a regular basis, once a week or sometimes twice a week, giving notice of changes to their recommended/maximum prices in the service stations in their network, that is, to the service stations that sell their brand (including COCO, CODO and DODO).

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143 *Cf*. Article 16 of Decree law no. 267/2002, in the wording of Decree law no. 389/2007.

144 *Cf*. Article 16 clause 3 of Decree law no. 267/2002, in the wording of Decree law no. 389/2007.

145 *Cf*. Article 21 clause 1 of Decree law no. 267/2002, in the wording of Decree law no. 389/2007.

146 The Esso operations in Portugal were acquired by Galp Energia, following a decision by the European Commission in the fourth quarter of 2008 – see Case no. COMP/M.5005, decision of 31 October 2008. The Agip operations in Portugal were acquired by Galp last September – see Case no. COMP/M.5169, decision of 9 September 2008.

1143. These changes in prices generally occur on a Tuesday or a Wednesday, when they learn of the ex-refinery price that will be in force from that Wednesday to the following Tuesday.

1144. The prices communicated by the oil companies are known by some as "maximum recommended prices" and by others as "reference prices".

1145. In practice, for the companies' own service stations (COCO) these are the prices that will be used in the other service stations (CODO and DODO). They end up in most cases being the prices effectively charged by the resellers, bearing in mind the small amount of leeway that is left to them in the contracts that bind them to the supplier of the fuel.

1146. Moreover, there was no statistically significant difference in 2008 between these recommended/maximum prices and the prices affixed in the service stations of the network (an annual average of the difference was 0,2 cents/litre for 95-octane gasoline and for diesel).

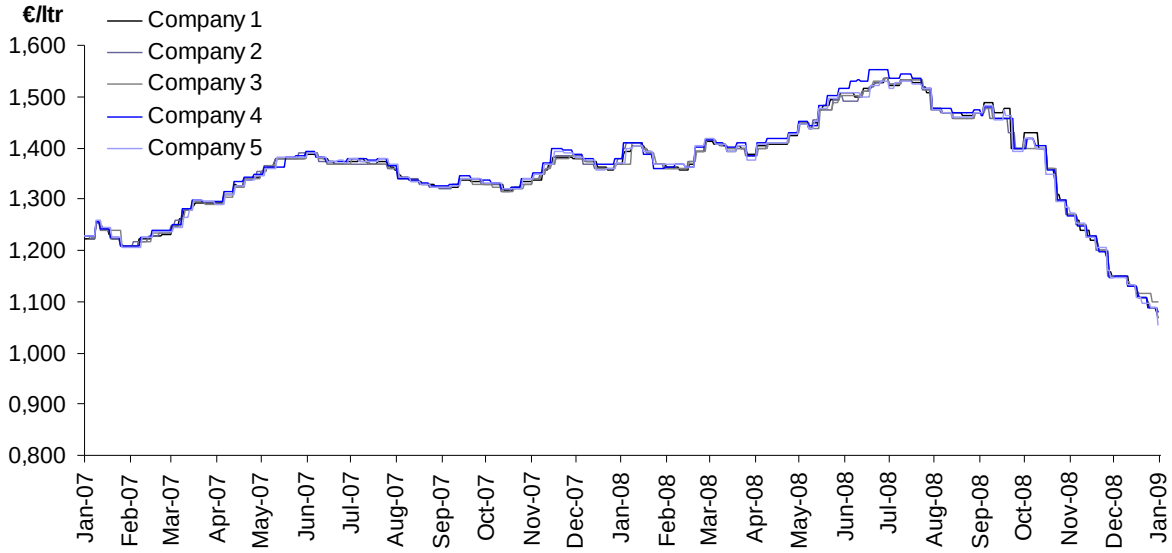
1147. Bearing in mind the fact that competition in retail sales, as previously mentioned, has a big local component, most of these companies suggest retail prices (maximum/recommended) that may be different according to the geographical location of the outlet.

1148. Even so, there is clearly a modal class of maximum/recommended prices, that is, a recommended price since it is passed on to most of the service stations in the operator's network.

1149. The Portuguese Competition Authority studied the changes in the modal class of the recommended pump price of the companies involved.

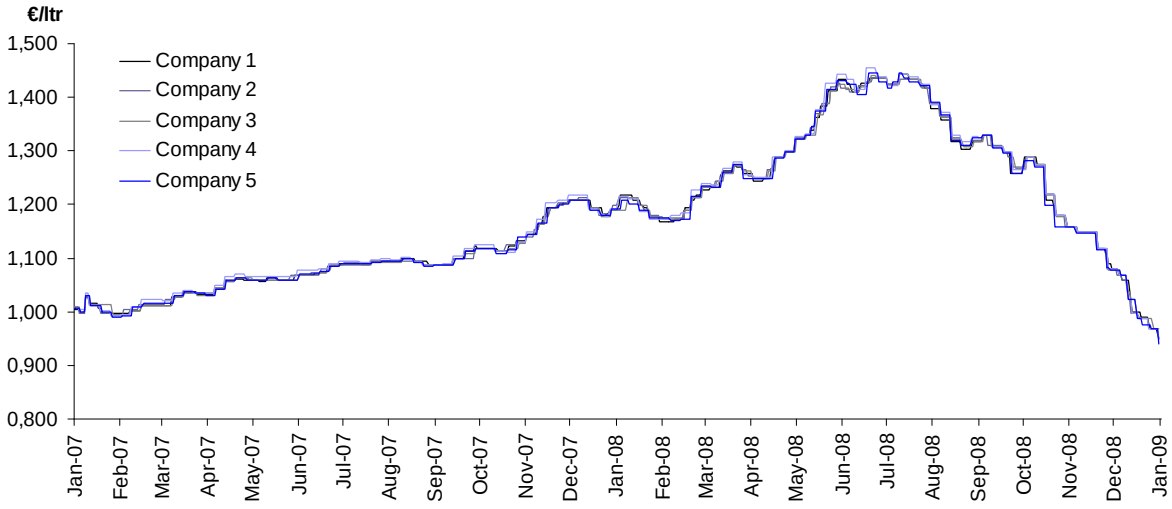
1150. From the analysis carried out, there is a clear case of parallel conduct in the changes of recommended pump price for 95-octane gasoline and diesel for road use by the oil companies during 2007 and 2008, as can be seen from the charts below.

Chart 55 – Changes in the recommended pump price of 95-octane gasoline of the four oil companies operating in Portugal during 2007 and 2008



Source: The companies.

Chart 56 – Changes in the recommended pump price of diesel for road use of the four oil companies operating in Portugal during 2007 and 2008

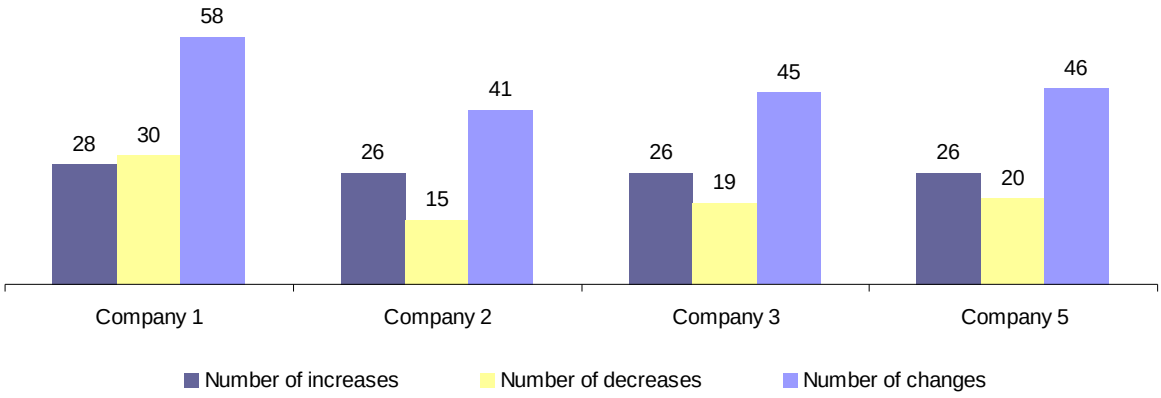


Source: The companies.

1151. This does not mean, however, that the recommended pump price of the companies will be exactly the same at all times and that they all change the price on exactly the same dates and in exactly the same amounts (on this issue, see the charts below, where there are details of the number of changes in the recommended pump price (modal) and the maximum,

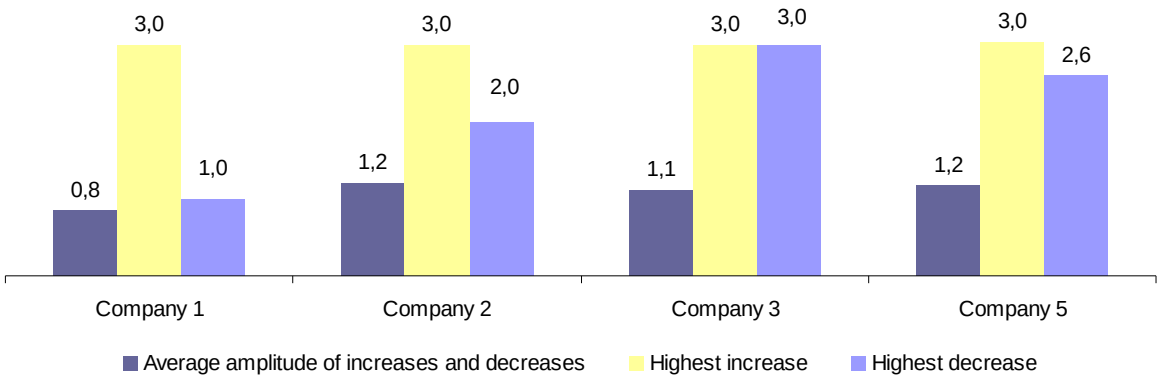
minimum and average range of the change in 2008 for 95-octane gasoline and for diesel for road use).

Chart 57 Number of changes in the price that is recommended/used as a modal reference for 95-octane gasoline in the four oil companies operating in Portugal in 2007



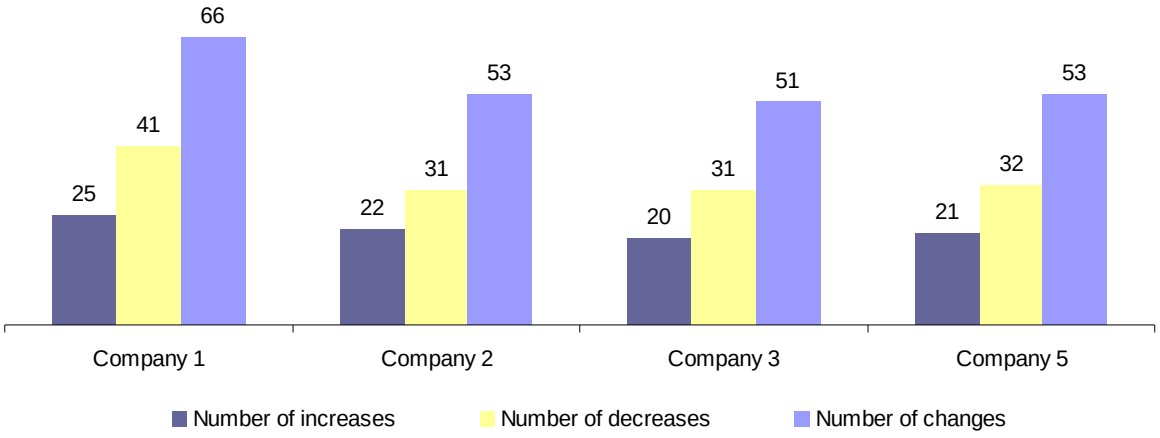
Source: PCA analysis based on Galp; BP; Repsol; and Cepsa data.

Chart 58 – Range of changes in cents per litre of the price that is recommended/used as a modal reference for 95-octane gasoline in the four oil companies operating in Portugal, in 2007



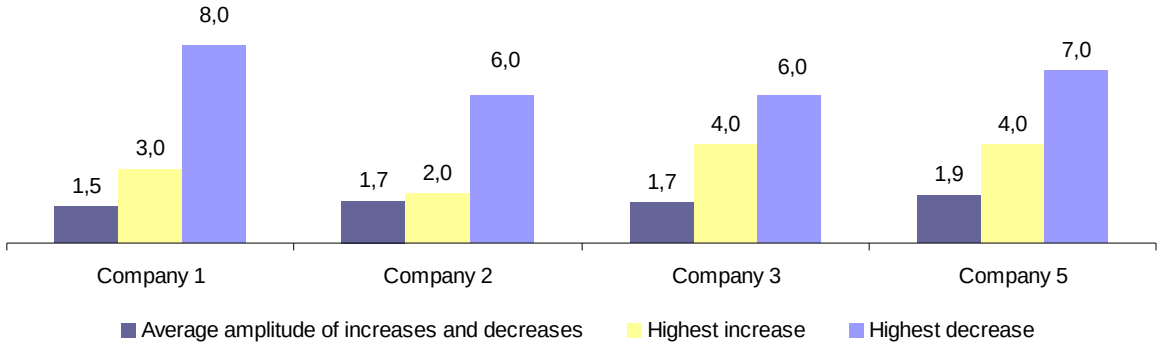
Source: PCA analysis based on Galp; BP; Repsol; and Cepsa data.

Chart 59 – Number of changes in the price that is recommended/used as a modal reference for 95-octane gasoline in the four oil companies operating in Portugal, in 2008



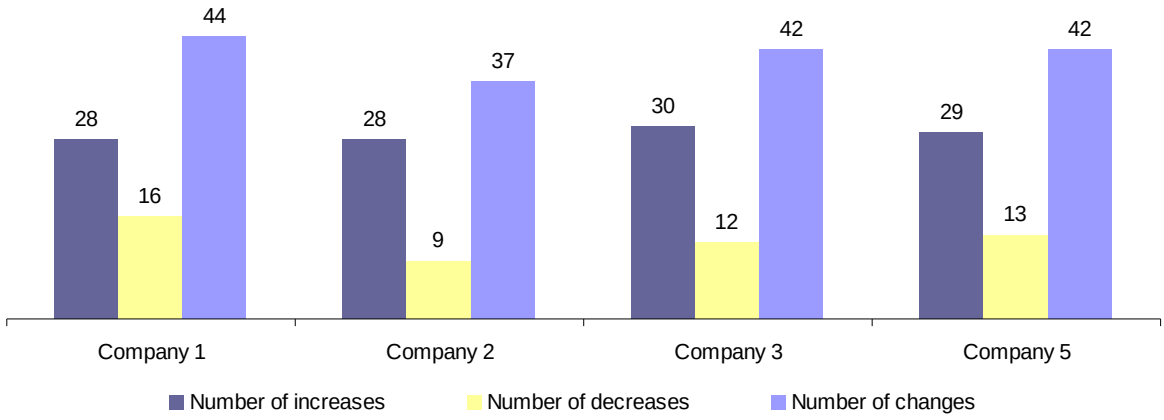
Source: PCA analysis based on Galp; BP; Repsol; and Cepsa data.

Chart 60 – Range of changes in cents per litre of the price that is recommended/used as a modal reference for 95-octane gasoline in the four oil companies operating in Portugal, in 2008



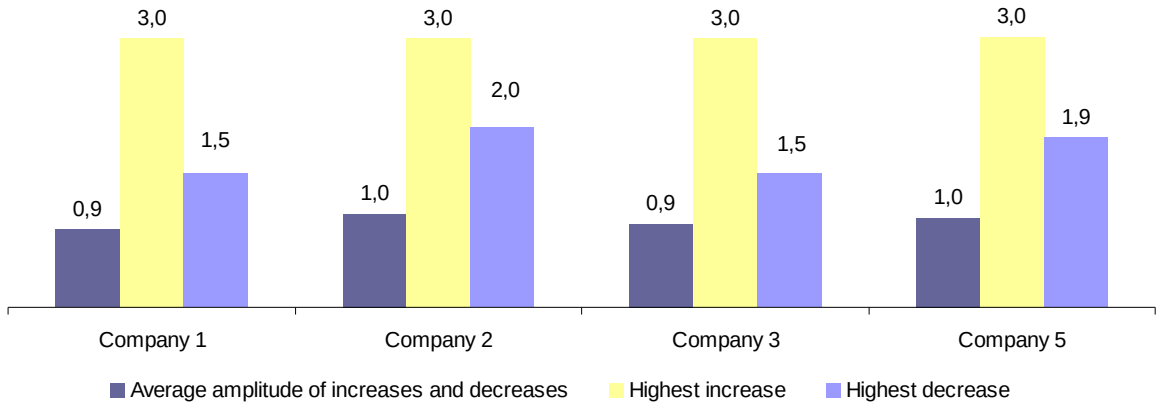
FSource: PCA analysis based on Galp; BP; Repsol; and Cepsa data.

Chart 61 – Number of changes in the price that is recommended / used as a modal reference for diesel for road use in the four oil companies operating in Portugal, in 2007



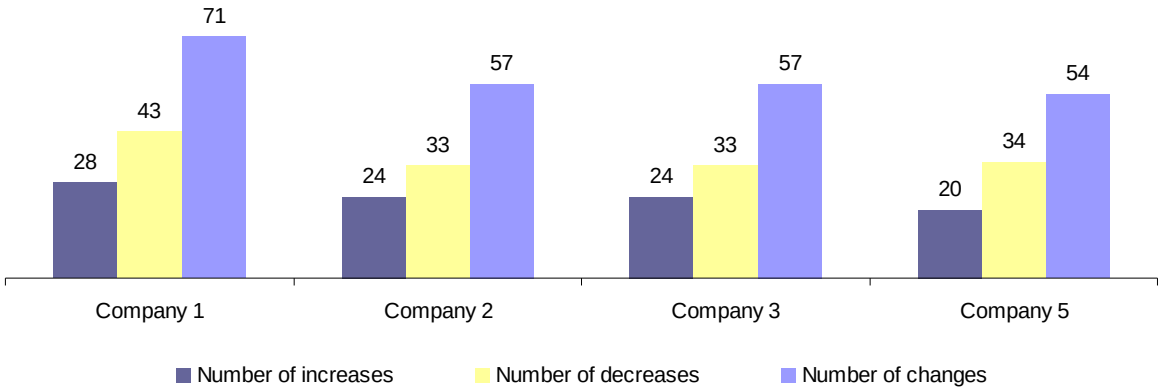
Source: PCA analysis based on Galp; BP; Repsol; and Cepsa data.

Chart 62 – Range of changes in cents per litre of the price that is recommended / used as a modal reference for diesel for road use in the four oil companies operating in Portugal, in 2007



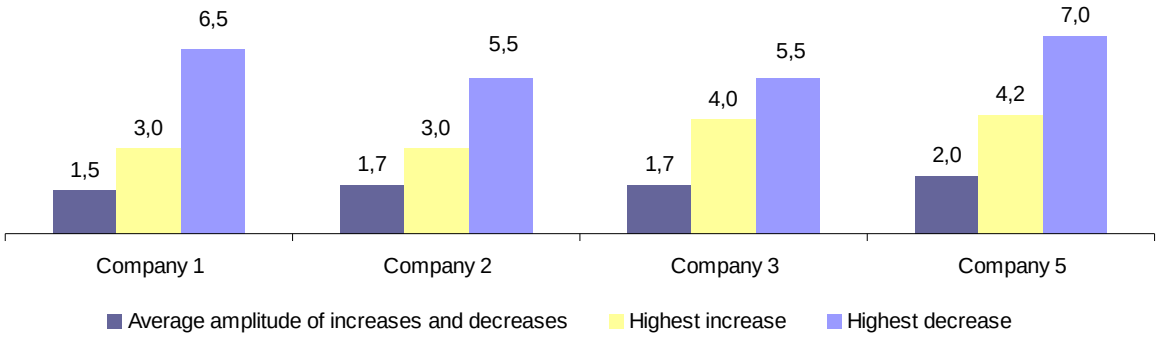
Source: PCA analysis based on Galp; BP; Repsol; and Cepsa data.

Chart 63 – Number of changes in the price that is recommended / used as a modal reference for diesel for road use in the four oil companies operating in Portugal, in 2008



Source: PCA analysis based on Galp; BP; Repsol; and Cepsa data.

Chart 64 – Range of changes in cents per litre of the price that is recommended / used as a modal reference for diesel for road use in the four oil companies operating in Portugal in 2008



Source: PCA analysis based on Galp; BP; Repsol; and Cepsa data.

1152. What it means is rather that the dates for changes may be different and the range of change may be different, but these facts are of little significance from the perspective of the end price for the consumer.

1153. The changes in the recommended pump price reflect most of all the changes in the ex-refinery prices analysed in section 6.4 and the changes in the retailers' margins analysed in section 9.7.

1154. So, during the whole of 2007 and in the first half of 2008, there can be seen an uninterrupted and relatively constant increase in the recommended pump price of gasoline and of diesel, tracking the ex-refinery prices for both types of fuel.

1155. The second half of 2008 was characterised by an abrupt fall in the recommended pump price, in step with the ex-refinery prices and, among other things, with the existence of adjustment asymmetries (see Chart 94).

1156. It should be noted that in percentage terms, the range of change in the recommended pump price is always lower than the range in the ex-refinery prices, to the extent that the recommended pump price includes the special tax on fuel, whereas the ex-refinery price does not.

1157. The ISP is a specific tax and does not vary with price. This attenuates the percentage change in the recommended pump price deriving from the ex-refinery price.

1158. During 2007 and 2008, the differences in the annual average of the daily recommended pump price of the four oil companies was statistically insignificant, as can be seen in the tables below.

Table 37 – Annual average of the daily recommended pump price of 95-octane gasoline of the four oil companies operating in retail sales in Portugal

	Company 1	Company 2	Company 3	Company 4
2007	1.325	1.325	1.325	1.327
2008	1.393	1.390	1.391	1.391

Source: Companies.

Table 38 – Quarterly average of the daily recommended pump price of 95-octane gasoline of the four oil companies operating in retail sales in Portugal

	Company 1	Company 2	Company 3	Company 4
1Q2007	1.243	1.245	1.245	1.244
2Q2007	1.358	1.359	1.357	1.358
3Q2007	1.345	1.344	1.345	1.347
4Q2007	1.354	1.353	1.351	1.357
1Q2008	1.388	1.389	1.386	1.389
2Q2008	1.466	1.464	1.464	1.467
3Q2008	1.481	1.477	1.479	1.478
4Q2008	1.236	1.232	1.236	1.232

Source: Companies.

Table 39 – Monthly average of the daily recommended pump price of 95-octane gasoline of the four oil companies operating in retail sales in Portugal

Monthly	Company 1	Company 2	Company 3	Company 4
1M2007	1.227	1.226	1.232	1.231
2M2007	1.223	1.225	1.224	1.224
3M2007	1.279	1.282	1.277	1.276
4M2007	1.324	1.324	1.320	1.321
5M2007	1.373	1.376	1.373	1.373
6M2007	1.377	1.375	1.376	1.380
7M2007	1.371	1.367	1.370	1.374
8M2007	1.334	1.333	1.333	1.335
9M2007	1.330	1.331	1.330	1.332
10M2007	1.326	1.324	1.322	1.328
11M2007	1.367	1.367	1.365	1.374
12M2007	1.369	1.368	1.368	1.369
1M2008	1.388	1.391	1.385	1.387
2M2008	1.375	1.376	1.374	1.380
3M2008	1.400	1.399	1.400	1.399
4M2008	1.411	1.412	1.410	1.414
5M2008	1.470	1.469	1.466	1.472
6M2008	1.516	1.512	1.515	1.513
7M2008	1.521	1.521	1.523	1.520
8M2008	1.468	1.464	1.464	1.466
9M2008	1.453	1.443	1.448	1.447
10M2008	1.367	1.358	1.359	1.357
11M2008	1.221	1.219	1.223	1.221
12M2008	1.120	1.120	1.126	1.118

Source: Companies.

Table 40 – Annual average of the daily recommended pump price of diesel for road use of the four oil companies operating in retail sales in Portugal

	Company 1	Company 2	Company 3	Company 4
2007	1.085	1.085	1.083	1.084
2008	1.263	1.263	1.263	1.261

Source: Companies.

Table 41 – Quarterly average of the daily recommended pump price of diesel for road use of the four oil companies operating in retail sales in Portugal

	Company 1	Company 2	Company 3	Company 4
1Q2007	1.013	1.014	1.014	1.014
2Q2007	1.063	1.064	1.062	1.062
3Q2007	1.095	1.093	1.093	1.094
4Q2007	1.166	1.165	1.163	1.164
1Q2008	1.214	1.216	1.213	1.211
2Q2008	1.357	1.357	1.354	1.357
3Q2008	1.353	1.354	1.356	1.355
4Q2008	1.127	1.124	1.128	1.121

Source: Companies.

Table 42 – Monthly average of the daily recommended pump price of diesel for road use of the four oil companies operating in retail sales in Portugal

	Company 1	Company 2	Company 3	Company 4
1M2007	1.005	1.004	1.010	1.005
2M2007	1.006	1.008	1.005	1.007
3M2007	1.029	1.030	1.026	1.028
4M2007	1.052	1.054	1.053	1.051
5M2007	1.061	1.061	1.058	1.060
6M2007	1.076	1.078	1.075	1.076
7M2007	1.091	1.090	1.090	1.090
8M2007	1.094	1.092	1.092	1.092
9M2007	1.100	1.097	1.097	1.099
10M2007	1.121	1.121	1.118	1.119
11M2007	1.179	1.178	1.176	1.176
12M2007	1.197	1.198	1.195	1.196
1M2008	1.198	1.198	1.194	1.191
2M2008	1.190	1.192	1.189	1.190
3M2008	1.253	1.255	1.254	1.252
4M2008	1.272	1.275	1.272	1.272
5M2008	1.370	1.371	1.364	1.372
6M2008	1.428	1.424	1.425	1.427
7M2008	1.426	1.424	1.425	1.426
8M2008	1.333	1.339	1.340	1.340
9M2008	1.297	1.299	1.301	1.297
10M2008	1.234	1.232	1.234	1.221
11M2008	1.134	1.132	1.133	1.130
12M2008	1.013	1.009	1.017	1.012

Source: Companies.

1159. The four oil companies, therefore, tend to be in step with each other's prices.

1160. The oil companies do not indulge in a price war among themselves. They merely work out less aggressive competition strategies based on loyalty

cards which make it possible to obtain bonuses and in some cases discounts on the price charged at the pumps.

1161. Esso was the only oil company on the market to charge on the basis of systematic prices below the others, and since it moved out of the market, all the others have continued to charge similar prices.

1162. Even when faced in certain places with supermarket service stations offering prices between 5 and 12 cents per litre lower, the oil companies, with rare exceptions, opt to maintain their reference prices unchanged, preferring to work with special discount campaigns, focusing on specific types of clients and/or times (special offers or weekends).

1163. A number of factors have contributed to this, among them:

- The homogenous nature of the product;
- The level of concentration of supply in retail sales of fuel where four oil companies controlled more than 80% of sales in 2007 and 2008;[147]
- Demand split into small components, associated with regularity, stability and low elasticity (to increases and differences in prices inter and intra-brands);
- The transparency of the market, which translates into:

  i. Abundant information on the market, available for operators along the value chain (for example, Platts NWE quotations, international quotations for Light Crude and for Brent, average pump price with and without tax in the member states of the European Union), as well as by the countless statistics on quantities sold (published for example by the Direcção Geral de Energia e Geologia);

  ii. The existence of systems of distribution based on similar contracts. All the oil companies, and they are few in number, operate similar distribution networks, setting up mechanisms to monitor and control the way the market works at retail level. This means that they know almost immediately the changes in competitors' prices at a local level. In these contracts, we find clauses that focus on:

     (a) Monitoring commercial conditions (such as prices) charged by the competition in the area;

[147] The Herfindahl-Hirschman index (IHH) was 2253 in 2007 and 2387 in 2008, taking the independents and the supermarkets as two aggregates. The CR4 was higher than 80% in both years.

(b) Monitoring individually and unilaterally by means of the so-called "mystery customer", both at service stations that sell the same brands and service stations that sell competitors' brands;

(c) Operating their own service stations or through a dealer, which makes it possible to specify the prices charged in these service stations;

iii. The fact that ex-refinery prices are fixed once a week and are unchanged for seven days means that the price at which each of the oil companies buys in any specific week is fundamentally very similar to what the others are paying;

- The contractual relations between the oil companies operating in Portugal are a neat fit, and result from: the existence of joint ventures; cross-holdings; multimarket contacts; swap agreements; vertical supply agreements; and many more besides:

i. There are various examples of structural relations (joint ventures) between the oil companies operating in Portugal, leading to a share in the strategic assets in the value chain in the sector. Galp, BP and Repsol are shareholders of the CLC, which owns the biggest distribution complex for fuel in Portugal and also owns the pipeline that connects the main domestic refinery to the main centre of consumption of fuel for road use. Galp, BP, Repsol and Cepsa are also among the main shareholders of the CLH in Spain, which has the biggest network of pipelines and storage facilities in that country;

ii. There are swap agreement for the exchange of products in the peninsula involving Galp, Repsol and Cepsa. These agreements mean that the companies involved can smooth out their logistics cost base to a single denominator;

iii. There is a symmetry of relationships (supplier – client) between oil companies and contacts in various markets: Galp is the main supplier of fuel for road use on an ex-refinery basis to Repsol, BP and Cepsa in Portugal, while Repsol, Cepsa and BP are the main suppliers of Galp in Spain.

- The capacity of operators other than the oil companies to exert any influence is limited by a number of factors: the oil companies dominate the import depots and distribution; there is congestion at important docking

points; the other operators do not have the scale for bargaining in the purchase of refined products; and there are administrative obstacles in the way of market penetration.

1164. Given all of this - the concentration in retail sales, a homogeneous nature of the product, the characteristics of demand, the transparency of the market, and the structural relations existing between the oil companies – the oil companies tend to adopt parallel conduct in retail sales.

9.5.2. The pricing policy of independents

1165. The independent operators operating in Portugal only have little room for manoeuvre in terms of price differentiation from the oil companies.

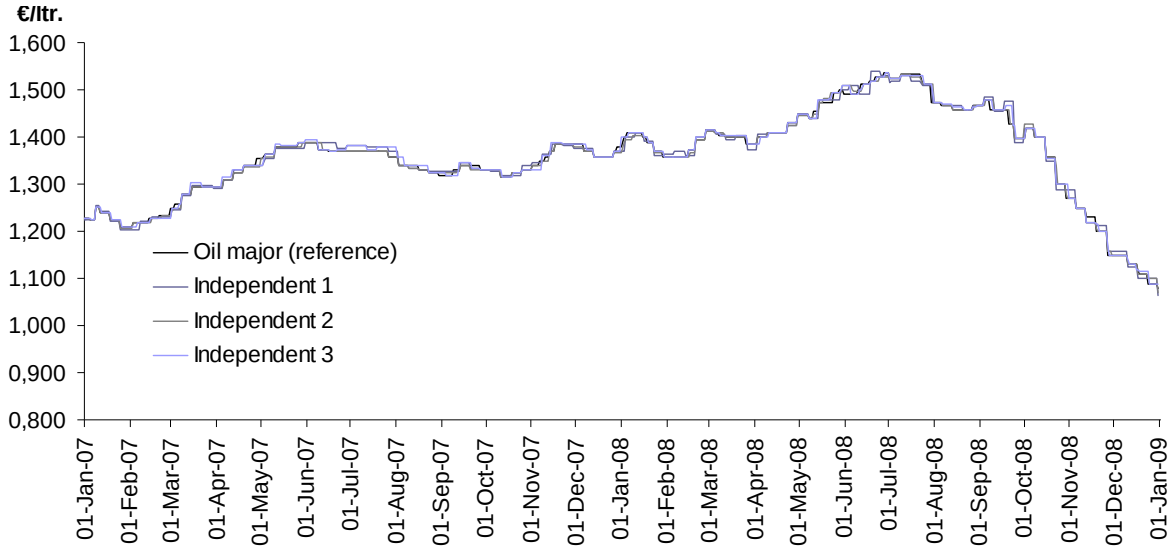
1166. For one thing, they are not in a position to purchase fuel on an ex-refinery basis; and because they have small retail networks, the quantities they can purchase in bulk do not give them any significant bargaining power over their suppliers.

1167. Given these circumstances, the independent operators end up by having a pricing strategy that is very similar to the operators of the DODO type for each one of the brands, since they do not have the capacity to offer lower prices than those of the oil companies.

1168. The only difference in relation to the DODO is that they do not sell under the brand name of the oil company and have (or theoretically could have) different suppliers, which does not always happen.

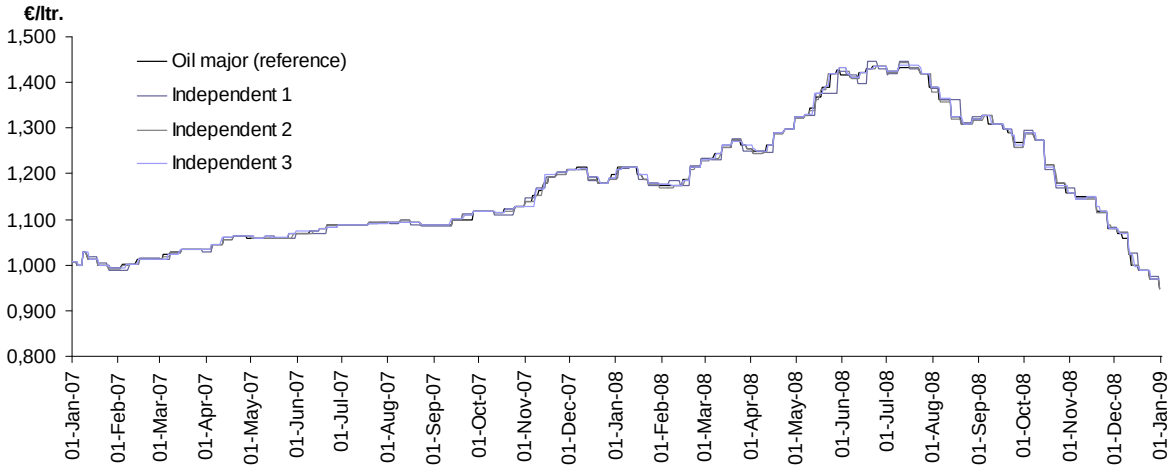
1169. As can be seen in the chart below, the independent operators keep close to the recommended pump price of the oil companies.

Chart 65 – Changes in the average pump price charged by the independent operators vs. the reference price charged by one of the oil companies for 95-octane gasoline in 2007 and 2008



Source: The companies.

Chart 66 – Changes in the average pump price charged by the independent operators vs. the reference price charged by one of the oil companies for diesel for road use in 2007 and 2008



Source: The companies.

1170. In point of fact, an analysis of pricing policy of three[148] of the biggest independent operators operating in Portugal reveals that the difference between the average daily prices charged by these and the daily

[148] Alves Bandeira, Azória and Petrin.

recommended pump price of the oil companies was zero in 2007 and only one tenth of a cent per litre different in 2008 for 95-octane gasoline, and zero in 2007 and 2008 for diesel for road use, similar to what happens with the oil companies, as mentioned in paragraph 1158.

1171. The differences between the average retail prices of the three independent operators analysed reveals also this small differentiation in price, shown in the tables below. It is important here to compare tables 37 to 42 relating to the recommended pump price of the oil companies and tables 43 to 48 relating to the average retail price of the independents.

Table 43 – Annual average of the average daily pump price of 95-octane gasoline of the three main independents operating in retail sales in Portugal

	Independent 1	Independent 2	Independent 3
2007	1.326	1.324	1.328
2008	1.391	1.391	1.392

Table 44 – Quarterly average of the average daily pump price of 95-octane gasoline of the three main independents operating in retail sales in Portugal

	Independent 1	Independent 2	Independent 3
1Q2007	1.243	1.244	1.245
2Q2007	1.359	1.358	1.361
3Q2007	1.348	1.343	1.349
4Q2007	1.354	1.352	1.353
1Q2008	1.387	1.387	1.391
2Q2008	1.464	1.465	1.465
3Q2008	1.478	1.478	1.479
4Q2008	1.234	1.234	1.234

Table 45 – Monthly average of the average daily pump price of 95-octane gasoline of the three main independents operating in retail sales in Portugal

	Independent 1	Independent 2	Independent 3
1M2007	1.226	1.226	1.228
2M2007	1.221	1.223	1.222
3M2007	1.279	1.280	1.284
4M2007	1.323	1.322	1.326
5M2007	1.369	1.374	1.377
6M2007	1.385	1.377	1.379
7M2007	1.378	1.367	1.379
8M2007	1.333	1.332	1.338
9M2007	1.333	1.329	1.331
10M2007	1.326	1.324	1.325
11M2007	1.369	1.365	1.367
12M2007	1.367	1.366	1.369
1M2008	1.386	1.387	1.392
2M2008	1.378	1.374	1.377
3M2008	1.397	1.400	1.402
4M2008	1.412	1.410	1.411
5M2008	1.466	1.470	1.471
6M2008	1.515	1.513	1.513
7M2008	1.516	1.522	1.522
8M2008	1.466	1.464	1.466
9M2008	1.452	1.446	1.450
10M2008	1.357	1.363	1.360
11M2008	1.224	1.218	1.218
12M2008	1.121	1.122	1.122

Source: Alves Bandeira, Azória and Petrin.

Table 46 – Annual average of the average daily pump price of diesel for road use of the three main independents operating in retail sales in Portugal

	Independent 1	Independent 2	Independent 3
2007	1.084	1.084	1.085
2008	1.263	1.262	1.264

Table 47 – Quarterly average of the average daily pump price of diesel for road use of the three main independents operating in retail sales in Portugal

	Independent 1	Independent 2	Independent 3
1Q2007	1.013	1.013	1.013
2Q2007	1.063	1.064	1.066
3Q2007	1.094	1.094	1.094
4Q2007	1.163	1.163	1.165
1Q2008	1.214	1.213	1.216
2Q2008	1.351	1.356	1.358
3Q2008	1.359	1.354	1.357
4Q2008	1.126	1.125	1.126

Table 48 – Monthly average of the average daily pump price of diesel for road use of the three main independents operating in retail sales in Portugal

	Independent 1	Independent 2	Independent 3
1M2007	1.006	1.004	1.006
2M2007	1.006	1.006	1.007
3M2007	1.027	1.029	1.027
4M2007	1.053	1.054	1.056
5M2007	1.061	1.060	1.062
6M2007	1.075	1.077	1.079
7M2007	1.090	1.090	1.090
8M2007	1.091	1.093	1.092
9M2007	1.100	1.099	1.100
10M2007	1.117	1.120	1.121
11M2007	1.179	1.175	1.178
12M2007	1.194	1.194	1.197
1M2008	1.195	1.197	1.200
2M2008	1.194	1.189	1.192
3M2008	1.252	1.253	1.256
4M2008	1.271	1.273	1.275
5M2008	1.360	1.371	1.372
6M2008	1.423	1.425	1.426
7M2008	1.425	1.427	1.428
8M2008	1.350	1.335	1.340
9M2008	1.300	1.299	1.301
10M2008	1.230	1.233	1.231
11M2008	1.131	1.129	1.132
12M2008	1.017	1.012	1.014

Source: Alves Bandeira, Azória and Petrin.

1172. So the pricing policy of independent operators in Portugal is a passive strategy: they follow the market leader.

9.5.3. The pricing policy of supermarkets

1173. The pricing policy in retail sales of fuel in the service stations run by supermarket chains is different from that of the oil companies and the independent operators.

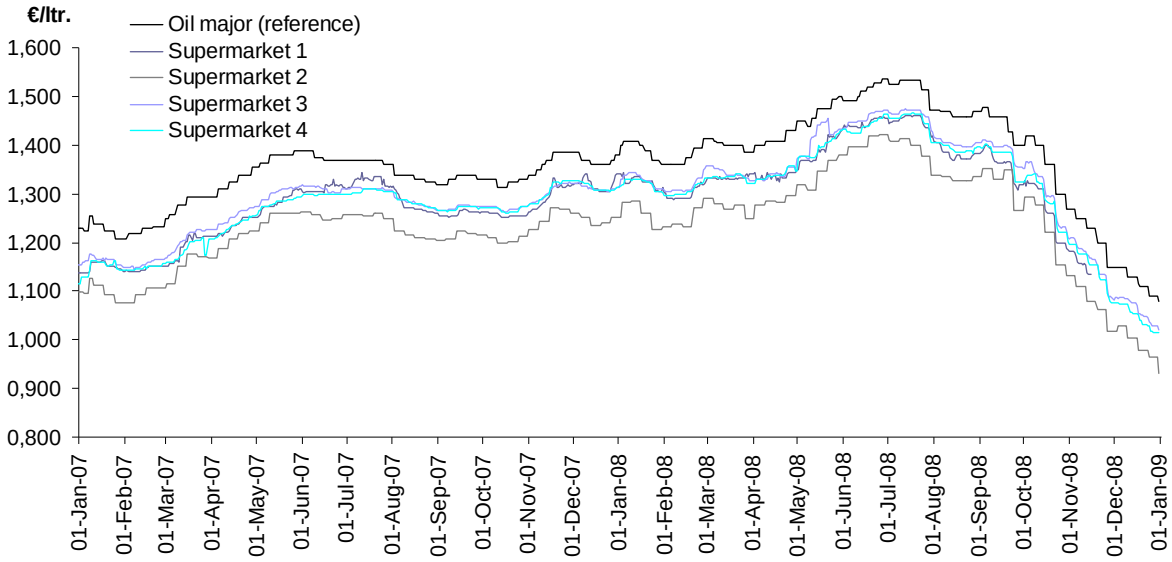
1174. According to surveys made by the Portuguese Competition Authority, the supermarkets, when they affix their prices, make sure they are offering lower prices within their area of influence.

1175. Many of the supermarkets monitor the prices of fuel in a cluster of service stations near their premises, including normally those belonging to the oil companies, but also of other supermarkets (where this is the case) and guarantee that their price is at least the same as the lowest charged (although there may be exceptions).

1176. All the supermarkets without exception sell at prices lower than the oil companies and independent operators.

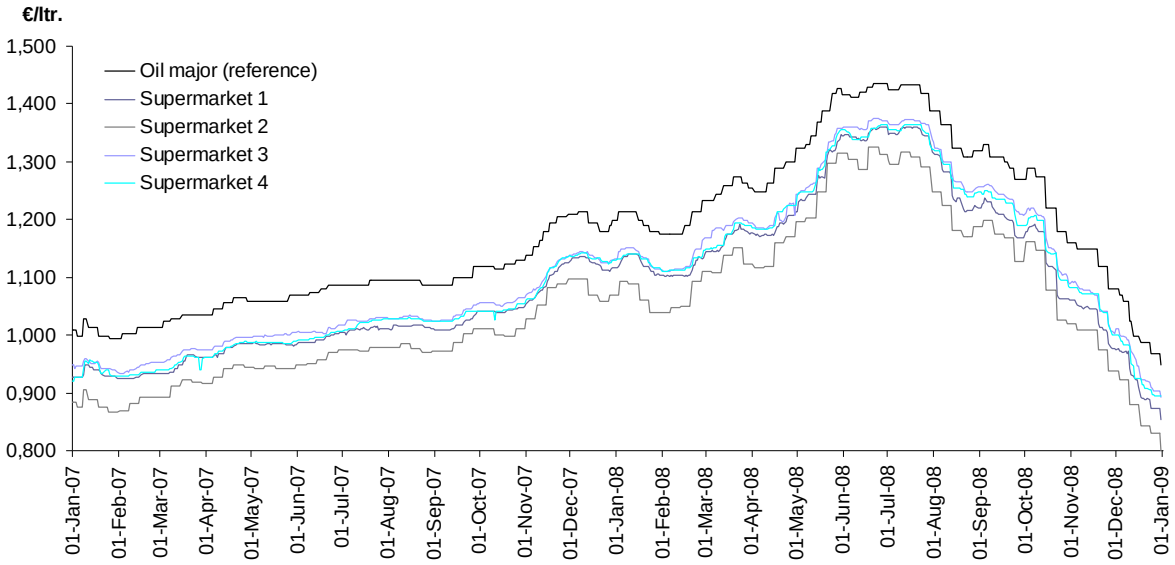
1177. This situation is illustrated in the charts below.´

Chart 67 – Changes in the average pump price charged by the supermarkets vs. the reference price charged by one of the oil companies for 95-octane gasoline in 2007 and 2008



Source: The companies.

Chart 68 – Changes in the average pump price charged by the supermarkets vs. the reference price charged by one of the oil companies for diesel for road use in 2007 and 2008



Source: The companies.

1178. According to the most recent data, the average difference between the pump price of the four oil companies and the price charged by the service stations run by the four biggest supermarkets was 8.8 cents per litre for 95-octane gasoline and 9 cents per litre for diesel during 2008. This is illustrated in the table below.

Table 49 – Average differential between the recommended pump price of the oil companies operating in Portugal and the average retail price of the main supermarket chains in retail sales of fuel in cents (€) / litre

	95-octane gasoline	Diesel for road use
2007	-8.2	-8.3
2008	-8.8	-9,0

Source: Galp; BP; Repsol; Cepsa/Total; Esso; AGIP; ITMI; Auchan; Leclerc; Continente.

1179. This difference was bigger than a year earlier (2007) when it was 8.2 cents per litre for 95-octane gasoline and 8.3 cents per litre for diesel.[149]

[149] These figues are significantly higher than those from the last assessment of this differential by the Portuguese Competition Authority, carried out in June 2008. This fact stms from two situaions: firstly, the number of operators in the June analysis was significantly lower than the current sample; and secondly that the basis for the data then used was different from the more recent study. Previously, the weekly DGEG data were used, but now the Portuguese Competition Authority has its own data base, using daily information that provides more detailed information.

1180. The average differences in 2008 came to an average saving for one 60-litre fuel tank of around €5.3/tank. For the average car user this would represent a saving of €126/year.[150]

1181. The possible indirect impact on prices at service stations which sell the oil companies' brands may not be so significant, to the extent that the limited number of supermarkets in the business of retail sales of fuel (with a 12% market share in 2008) has led to very little reaction from the oil companies in terms of pricing policies (normally limited to discounts of 5 to 6 cents per litre at weekends, in a restricted group of service stations) in a context where price elasticity in demand is relatively low.

1182. However, if the supermarket service stations were to reach a wider cover of the country, it is possible that these effects would become relevant, and more so than the direct effects.

1183. Not all the supermarket chains have, however, followed the same pricing policy in retail sales of fuel for road use.

1184. Some supermarket chains seem to have opted for less aggressive pricing strategies in retail sales of fuel following agreements with oil companies to use a cross-discounting system between them.[151]

1185. With this type of special offer, the consumer purchases products in a supermarket above a certain figure and is given a voucher with an expiry date. This voucher allows the holder to purchase fuel at a discount of 5 to 6 cents/litre from a limited number of service stations selling the brand of a specific oil company with which the supermarket has made an agreement.

1186. In some cases, after purchasing fuel with one of these vouchers, the consumer is given another voucher and this can be used for a discount at the supermarket within a specific time frame and over a certain minimum value of purchases - special offers on both sides and other extras.

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[150] This calculation was for a diesel-powered car with consumption of 7litres/100km, doing 20,000km/year.

[151] This conclusion is based on the fact that the retail prices charged by those service stations which are part of a chain without an agreement with an oil company are typically lower than what is charged by those supermarket service stations with this type de agreements – see paragraph 1197 below.

1187. This type of agreements was only possible in Portugal with a change in the law in 2005[152], when it was made easier for supermarkets to enter the retail business of fuel for road use.

1188. These agreements have brought benefits to the consumer through a discount on the pump price of fuel for road use, a situation that did not occur prior to the change in the law relating to supermarkets entering the retail business of fuel for road use.

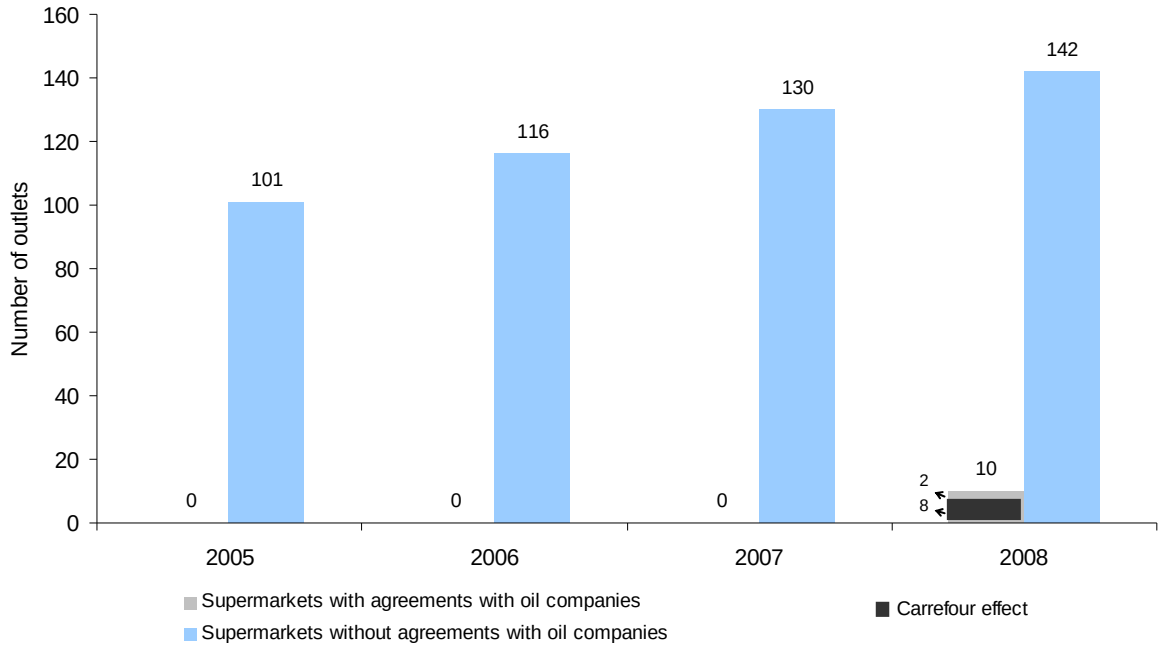
1189. However, the possible negative impact of this type of agreement on competition in retail sales of fuel has to be highlighted. This can affect the supply side and the demand side.

1190. On the supply side, these agreements can act as a disincentive to large supermarket chains when considering penetration and expansion in retail sales of fuel.

1191. Indeed, it can be seen that the supermarket chains with agreements of this type in Portugal have been those slowest to expand their network of service stations (and in some cases they have not even entered the business of retail sales of fuel). They also have a smaller number of service stations as a proportion of their position in the retail food business, as can be seen in the charts below.

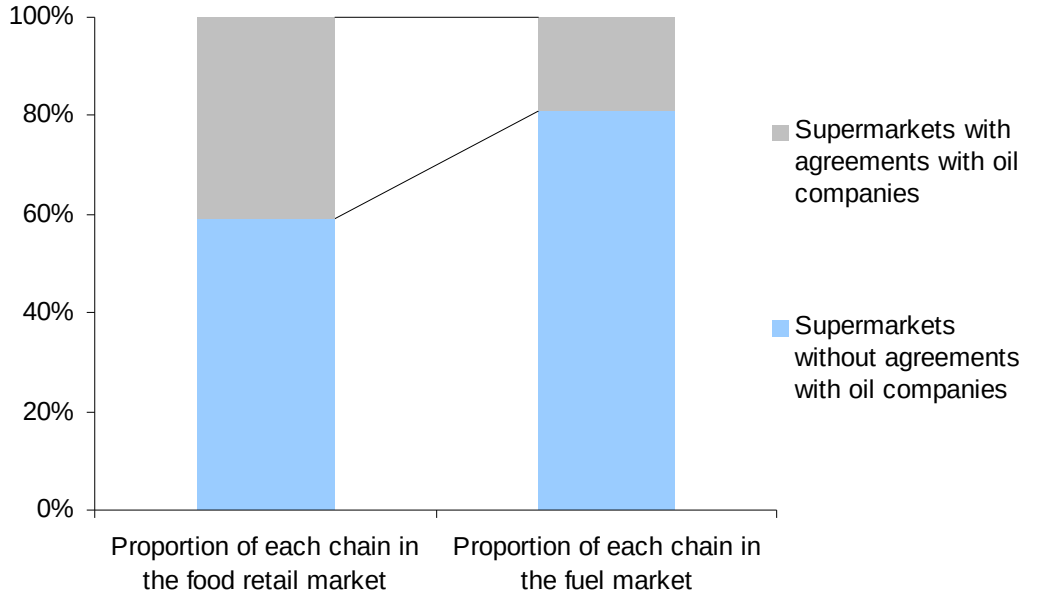
[152] See Executive order no. 362/2005, of 4 April, mentioned in paragraph 103.

Chart 69 – Changes in the number of service stations belonging to supermarkets from 2005 to 2008



Source: Published information from the companies.

Chart 70 – Proportion of each type of supermarket in the total retail sales of food[153] vs. proportion of each type of supermarket in the total retail sales of fuel in 2008



Source: Supermarkets.

[153] Including hypermarkets, supermarkets and discount stores.

1192. The supermarket chains having agreements with oil companies accounted for more than 40% of the sales of food products in hypermarkets/ supermarkets/ cash and carry stores in 2008, but less than 20% of the sales of fuel for road use made by the same segment.

1193. The situation, therefore, was that at the end of 2008 the supermarkets having agreements with oil companies had a much lower relative proportion in retail sales of fuel than in retail sales of food and beverages.

1194. There has been a relatively slow increase in market share of the supermarkets in retail sales of fuel in Portugal. This can be explained, in part at least, by the lack of aggressiveness from supermarkets with a big volume of retail sales of food and domestic products.

1195. So in 2008, these operators together only accounted for 12% of fuel sales in Portugal, while their proportion of own brand products in retail sales in the same period, was [25%-35%].

1196. It can be seen that these agreements tend to curtail the aggressiveness of the supermarkets' pricing policy that have them when compared with the aggressiveness in pricing by other supermarkets in the retail sales of fuel.

1197. So, the average differential in prices between the supermarket service stations (outside the agreements with the oil companies) and the main oil companies was close to 9 cents per litre in 2008, but the average discount given by the oil companies (imputed to the service stations) within the scope of these agreements was 5 to 6 cents per litre.

1198. It should be added that the discount offered under these agreements only covers a fraction of the service station customers, in fact only those who have the discount voucher from the supermarket, and only during the period when it is valid (normally 1 month).

1199. So, the scope of this discount is significantly less than the amount involved if there were a cut in the prices charged at one of the supermarket's service stations. This would be available for any consumer, whether they had made purchases in the supermarket or not, and at any moment in time.

1200. In a scenario where there is no agreement between supermarkets and oil companies, that is, where the supermarket was opening a service station with prices similar to those charged by the other supermarkets, a considerable volume of sales of fuel would probably be lost by the oil company and picked up by the supermarket.

1201. So these agreements on the supply side place the level of competition, through price, at a threshold different from what would be the case if there were none.

1202. However, the effect of such an agreements is not exclusively on the supply side. These agreements also have an effect for the consumer on the demand side.

1203. The discount given because of a purchase involving two products not otherwise related creates a strategic interdependence between these products.

1204. In such agreements between supermarkets and oil companies, it is not clear whether there is an unmistakable benefit for all consumers.[154]

1205. Consumers may also be affected in terms of the limit placed on their relative freedom of choice at the point of purchase (to the extent that the discount vouchers have to be used within a given window of opportunity).

1206. Taking into consideration all the issues raised above, we need to estimate the benefit which would redound to the consumer if the agreements between oil companies and supermarkets were replaced by direct supermarket penetration in retail sales of fuel. The findings are as follows:

1207. Our estimate uses a comparison between two scenarios:

- Scenario 1 – A scenario in which there is an agreement between the oil company and the supermarket, where the former offers a 5 cents per litre discount to the customers who use the service stations of the oil company in the area of influence of the supermarket. For this they give a discount voucher. In this scenario the supermarket agrees not to set up its own network of service stations;
- Scenario 2 – A scenario in which the supermarket opts to set up a network of service stations with retail sales of fuel with a price (and the figure here is the 2008 amount) 9 cents below the reference price of the oil companies and the voucher is given to all customers of the service stations whether they are customers of the supermarket or not.

1208. For scenario 1, there are various possibilities in terms of the average percentage of service station users who receive discount vouchers that can be exchanged for fuel.

[154] *Cf.* Joshua S. Gans & Stephen P. King (2006): "Paying for loyalty: product bundling in oligopoly", *The Journal of Industrial Economics*, vol. 54, no. 1, pp. 43-62.

1209. In this scenario, as can be seen in the table below, where there is an agreement between the supermarket and an oil company, the average discount for the service station customer can vary between 1.25 cents per litre and 3.75 cents per litre depending on the percentage of service station customers who use the discount vouchers.

1210. In scenario 2, where there is no agreement between the oil company and the supermarket, all the users of the service station benefit from the same discount, which comes to around 9 cents per litre.

1211. In these situations, the average difference between the real price in scenario 1 and in scenario 2 gives scenario 2 a benefit of between 5,25 cents per litre and 7.75 cents per litre.

Table 50 – Estimate of what the consumers of fuel could lose in terms of their economic well-being when there is an agreement between an oil company and a supermarket chain

Scenario 1				Scenario 2		
% of users of the service station with voucher	Discount with voucher (cents per litre)	Discount for clients without voucher or with invalid voucher	Average discount per user (cents per litre)	Average discount per user (cents per litre)	Difference (cents per litre)	Impact on 10% of retail sales in the market (millions of euros)
25%	5,00	0,00	**1.25**	**9,00**	**-7.75**	42
50%	5,00	0,00	**2.50**	**9,00**	**-6.50**	35
75%	5,00	0,00	**3.75**	**9,00**	**-5,25**	28

Source: Portuguese Competition Authority.

1212. In other words, on average, the fact that a supermarket chain comes to an agreement with an oil company to set up a system of crossed or bundled discounts rather than opening its own network of service stations and sell fuel with the average discount witnessed in the market between supermarket service stations and oil companies service stations represents a smaller reduction in the final price paid by the consumer, coming to between 5.25 and 7.75 cents per litre.

1213. From the above, allied to the fact that service stations near retail parks such as those managed by supermarkets charge on average lower prices for 95-octane gasoline and diesel, the conclusion is that the growth of supermarket service stations is an important factor for retail price competition, and this competitive pressure is likely to lead to considerable benefits for consumers.

9.6. Changes in the retail prices of liquid fuels for road use

9.6.1. Average retail prices in Portugal

1214. During 2007 and 2008, the average retail price in Portugal followed the trend in the ex-refinery prices and the bulk prices for diesel and 95-octane gasoline.

1215. This meant that during the whole of 2007 and the first half of 2008, diesel for road use saw its average pump price increase by more than 40 cents per litre and 95-octane gasoline by more than 30 cents per litre.

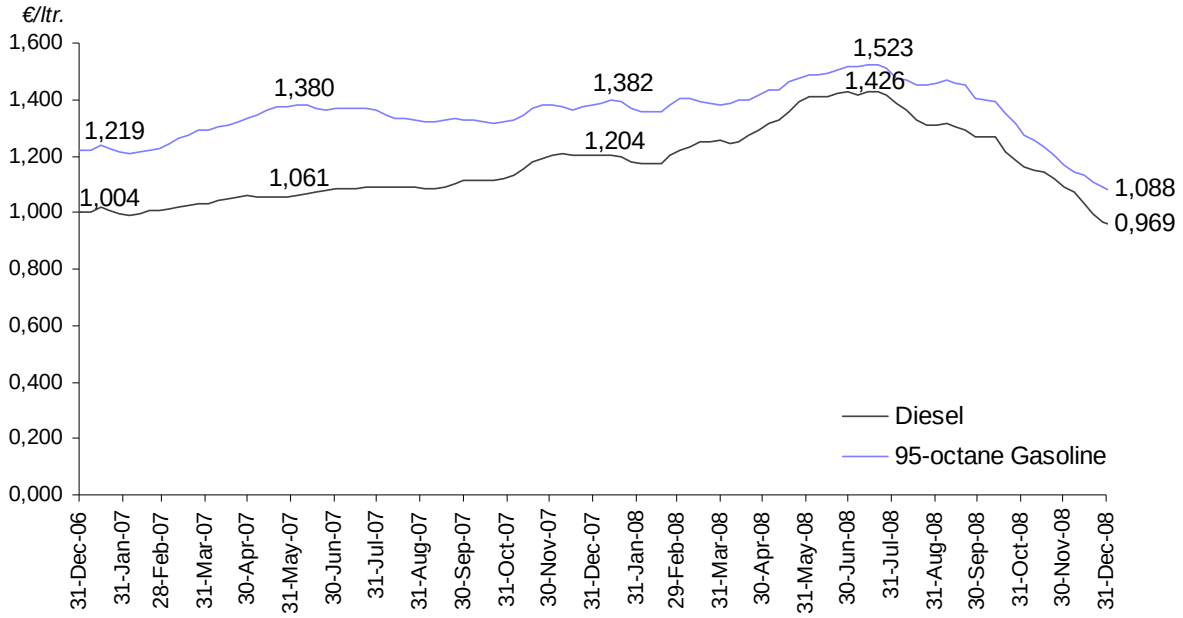
1216. Indeed, at the start of 2007, the average pump price of 95-octane gasoline was €1.219/litre and diesel for road use was €1.004/litre. At the end of 2007, the prices were €1.382/litre and €1.204/litre and at the end of July 2008 they reached their maximum, standing at around €1.523/litre and €1.426/litre.

1217. Only during the second half of 2008 was there a sudden fall in the average pump prices for both types of fuel for road use, and this fall led to prices lower than those recorded at the start of 2007.

1218. In the last week of 2008, the average pump price of 95-octane gasoline was €1.088/litre and diesel was €0,969/litre.

1219. The changes are illustrated in the chart below:

Chart 71 – Changes in the average pump price of fuel (95-octane gasoline and diesel for road use) in 2007 and 2008



Source: European Commission.

95-octane gasoline

1220. The changes in the average pump price of 95-octane gasoline are detailed in the table below (the changes in the ex-refinery prices/cargo are set out in section 6.4; see also subsections 9.6.4 to 9.6.8 of this report):

Table 51 – Changes in the quarterly averages and the average weekly pump price of 95-octane gasoline in Portugal in 2007 and 2008, in €/litre

	2007	2008	Change between year-on-year periods	Change between year-on-year periods (%)
1st Quarter	1.235	1.382	0,147	12%
2nd Quarter	1.347	1.455	0,108	8%
3rd Quarter	1.344	1.474	0,130	10%
4th Quarter	1.351	1.236	-0,115	-9%
Annual	**1.320**	**1.387**	**0,067**	**5%**
Change from 4Q2007 to1Q2008		0,032		
Change from 1Q2008 to 2Q2008		0,072		
Change from 2Q2008 to 3Q2008		0,019		
Change from 3Q2008 to4Q2008		**-0,239**		
Change from 4Q2007 to1Q2008 (%)		2%		
Change from 1Q2008 to 2Q2008 (%)		5%		
Change from 2Q2008 to 3Q2008 (%)		1%		
Change from 3Q2008 to4Q2008 (%)		**-16%**		

Source: Analysis by the Portuguese Competition Authority based on data from the European Commission.

Diesel for road use

1221. These changes in the average pump price of diesel for road use are detailed in the table below (changes in the ex-refinery prices/cargo are set out in section 6.4; see also subsections 9.6.4 to 9.6.8 of this report.

Table 52 – Changes in the quarterly averages and the average weekly pump price of diesel for road use in Portugal in 2007 and 2008, in €/litre

	2007	2008	Change (year on year)	Change (year on year) (%)
1st Quarter	1.009	1.209	0,199	20%
2nd Quarter	1.057	1.349	0,292	28%
3rd Quarter	1.089	1.352	0,263	24%
4th Quarter	1.161	1.129	-0,032	-3%
Annual	**1.080**	**1.260**	**0,179**	**17%**
Change from 4Q2007 to1Q2008		0,048		
Change from 1Q2008 to 2Q2008		0,140		
Change from 2Q2008 to 3Q2008		0,003		
Change from 3Q2008 to4Q2008		**-0,223**		
Change from 4Q2007 to1Q2008 (%)		4%		
Change from 1Q2008 to 2Q2008 (%)		12%		
Change from 2Q2008 to 3Q2008 (%)		0%		
Change from 3Q2008 to4Q2008 (%)		**-16%**		

Source: Analysis by the Portuguese Competition Authority based on data from the European Commission.

9.6.2. Comparisons between the average pump price in Portugal by regions

1222. As mentioned in section 9.1, in retail sales of fuel for road use there is a strong local element in competition, to the extent that drivers tend to pick up fuel in the service stations close to their home or place of work.

1223. The scope of this report does not justify an analysis of each of the local markets, but retail sales of fuel in an analysis of the intermediate aggregate level between the national and the local, in this case the regional, for the four quarters of 2008, makes it possible to assess differences that may appear in the average retail price between regions.

1224. For the comparisons of the average retail price across the regions in mainland Portugal, the five NUT II regions were used: North, Central, Lisbon and Vale do Tejo (LVT), the Alentejo and the Algarve.

1225. The comparisons between regions are based on a range of variation from the average retail price (the difference between the lowest and the highest price charged for the sale to the public), both of 95-octane gasoline and of diesel, calculated from the prices in the last week of each quarter.

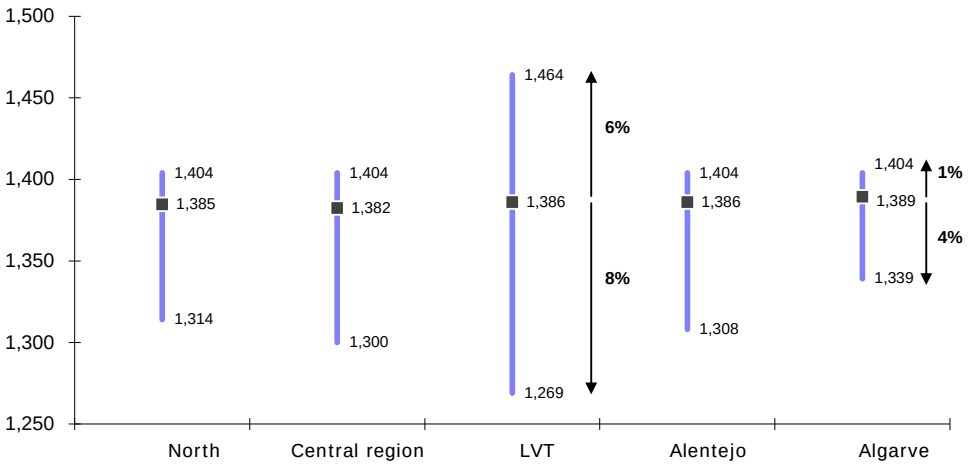
First quarter of 2008

1226. In the last week of this quarter (the last week of March[155]), the average price of 95-octane gasoline did not differ significantly between the five regions. The maximum difference recorded was 0,7 cents/litre. The Algarve recorded the highest average price (€1.389/litre), and the central region the lowest average price (€1.382/litre).

1227. The ranges of variation were different between regions during the last week of March. For 95-octane gasoline, the biggest range of variation in prices was recorded in the LVT region (14%), and the region with the smallest range of variation was the Algarve (5%).

1228. The lowest price for 95-octane gasoline (€1.269/litre) and the highest price (€1.464/litre) were both recorded in the LVT region.

Chart 72 – Range of variation in the average pump price of 95-octane gasoline in the last week of the first quarter of 2008 (in €/litre)



Source: Portuguese Competition Authority analysis based on data from the DGEG

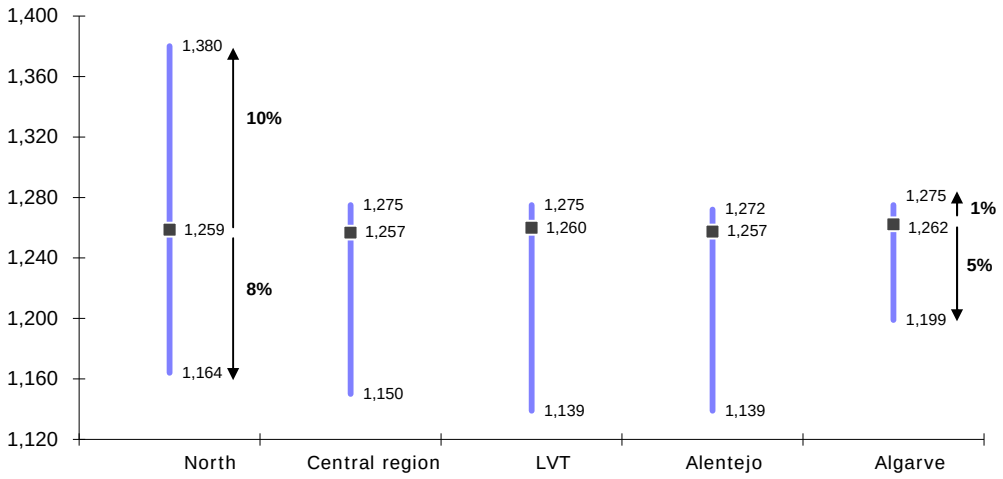
1229. As for diesel, the average prices between regions did not differ significantly (0,5 cents/litre). The lowest average price was recorded in the Central and Alentejo regions (€1.257/litre) and the highest in the Algarve region (€1.262/litre).

1230. The ranges of variation in the prices of diesel are, on average, bigger between the various regions. The northern region has the biggest range of variation (around 18%), and the Algarve the smallest (6%).

[155] Week of 24 to 30 March 2008.

1231. For diesel, the lowest price recorded was in the regions LVT and the Alentejo (€1.139/litre), while the highest price (€1.380/litre) was recorded in the North.

Chart 73 – Range of variation in the average pump price of diesel for road use in the last week of the first quarter of 2008 (em €/litre)



Source: Portuguese Competition Authority analysis based on data from the DGEG.

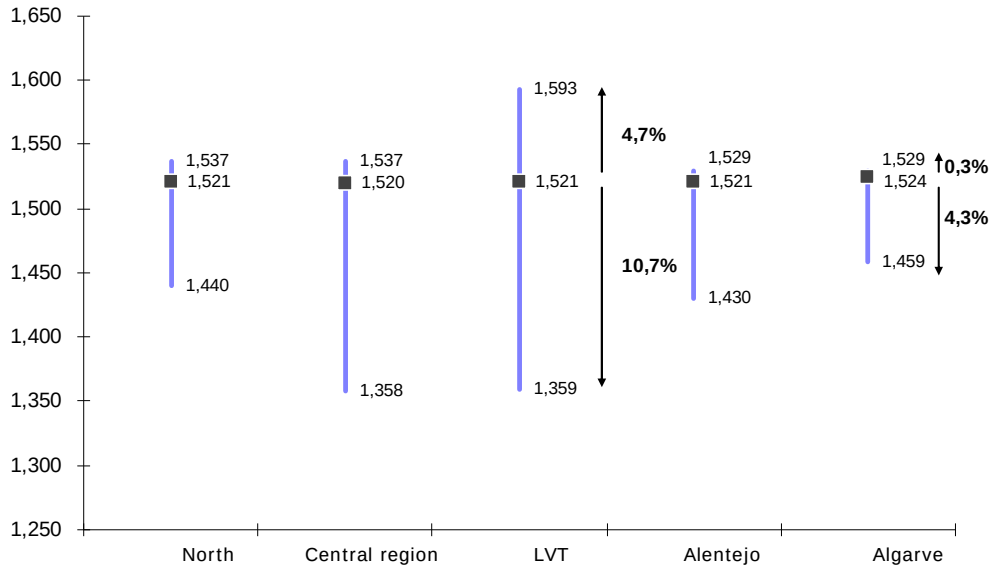
Second quarter of 2008

1232. In the last week of this quarter (the last week of June), the average pump price of 95-octane gasoline was not significantly different between regions. The maximum difference recorded was 0,4 cents/litre. Both towards the end of the first quarter of 2008 and in the second quarter, the Algarve recorded the highest average price (€1.524/litre) and the central region the lowest average price (€1.520/litre).

1233. The ranges of variation were different between regions during the last week of March. For 95-octane gasoline, the biggest range of variation was again recorded in the LVT region (15,4%), and the region with the smallest range of variation was the Algarve (4.6%).

1234. The lowest price for 95-octane gasoline was recorded in the central region (€1.358/litre) and the highest price in the LVT region (€1.593/litre).

Chart 74 – Range of variation in the average pump price of 95-octane gasoline in the last week of the second quarter of 2008 (em €/litre)



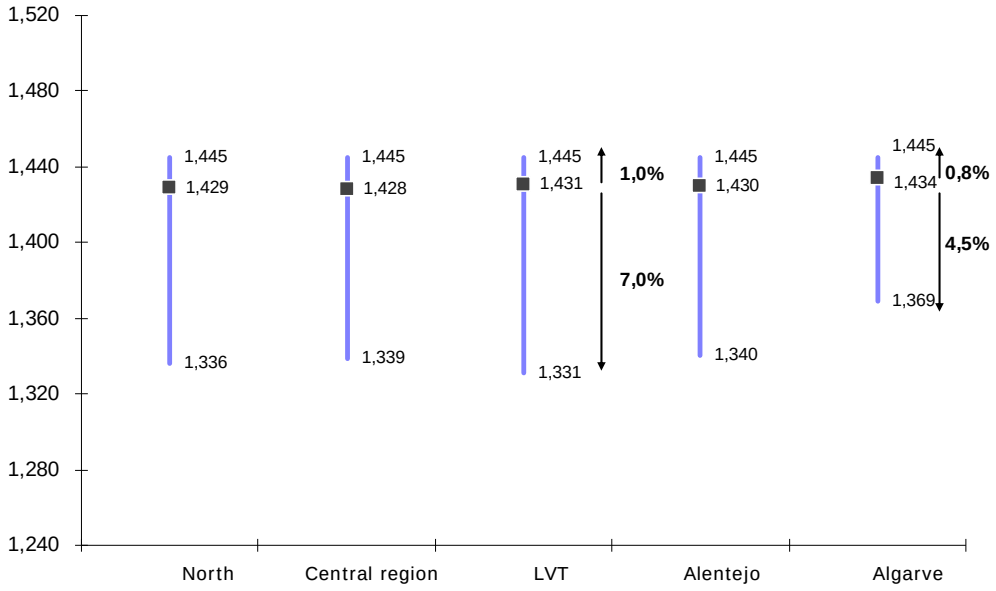
Source: Portuguese Competition Authority analysis based on data from the DGEG.

1235. As for diesel, the average prices between regions were also not significantly different (0,6 cents/litre). The lowest average price was recorded in the LTV region (€1.331/litre) and the highest was identical in all the regions of the country (€1.445/litre).

1236. The ranges of variation in the prices of diesel are, on average, bigger between the different regions. The LVT region had the biggest range of variation (around 8%), and the Algarve the smallest (5,3%).

1237. For diesel, the lowest price was recorded in the LTV region and the Alentejo (€1.331/litre), while the highest price (€1.445/litre) was identical in all the regions of the country.

Chart 75 – Range of variation in the average pump price of diesel for road use in the last week of the second quarter of 2008 (em € / litre)



Source: Portuguese Competition Authority analysis based on data from the DGEG.

Third quarter of 2008

1238. In the last week of this quarter (the last week of September), the average retail price of 95-octane gasoline was not significantly different between the five regions. The maximum difference recorded was 0.6 cents/litre.

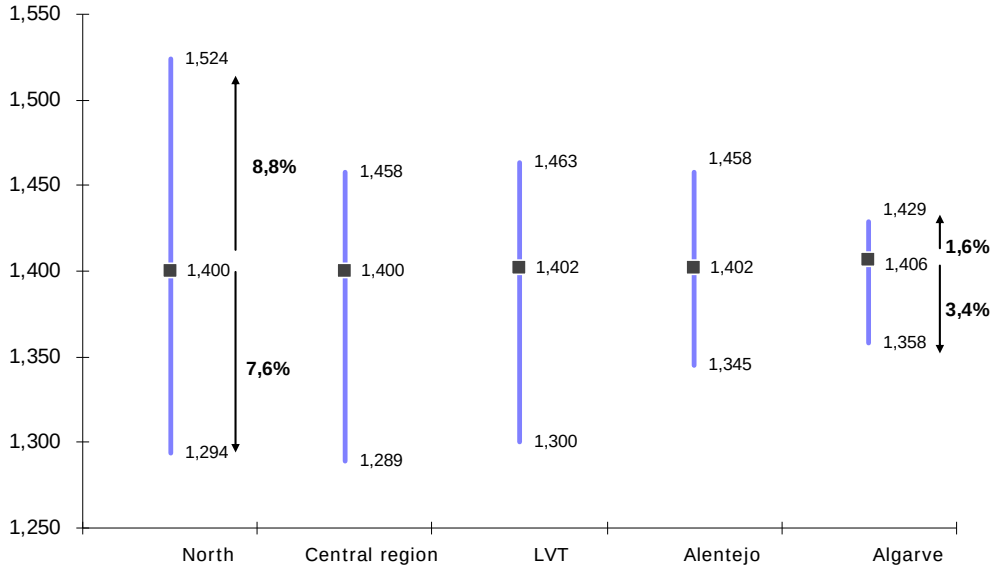
1239. As at the end of the first and second quarters of 2008, also at the end of the third quarter the Algarve recorded the highest average price (€1.406/litre). The central region, along with the North, at the end of September 2008, came in with the lowest average price (€1.400/litre).

1240. The ranges of variation were different between regions during the last week of September. For 95-octane gasoline, the biggest range of variation in prices was recorded in the North (16.4%), and the region with the smallest range of variation was the Algarve (5%).

1241. During this quarter, a substantial increase in the range of prices was seen in the North, both for 95-octane gasoline and for diesel.

1242. The lowest price for 95-octane gasoline was recorded in the Central region (€1.289/litre) and the highest price in the North (€1.524/litre).

Chart 76 – Range of variation the average pump price of 95-octane gasoline in the last week of the third quarter of 2008 (em €/litre)



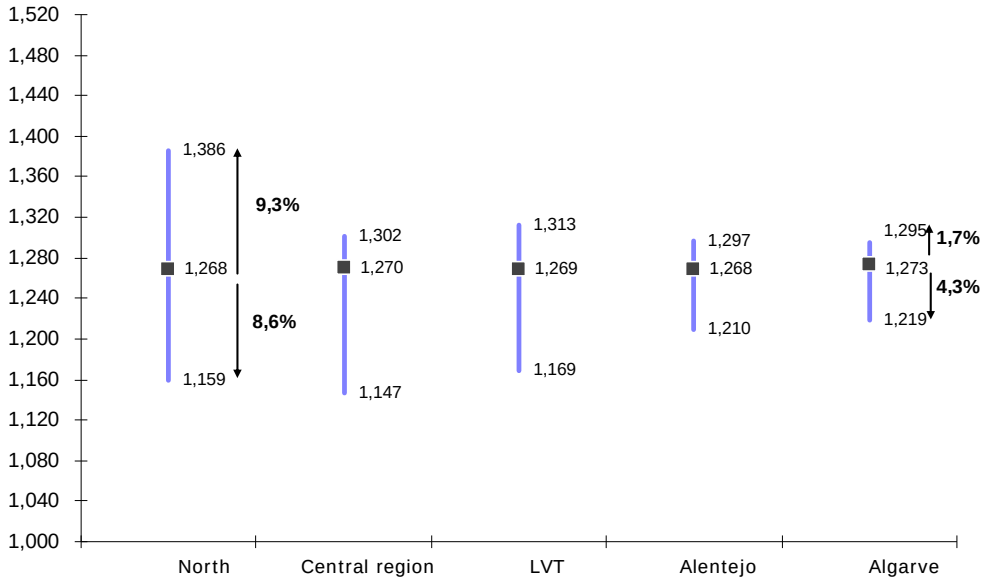
Source: Portuguese Competition Authority analysis based on data from the DGEG.

1243. As for diesel, the average prices between regions were also not significantly different (0,5 cents/litre). The lowest average price was recorded in the northern region and in the Alentejo (€1.268/litre) and the highest in the Algarve (€1.273/litre).

1244. The ranges of variation in the prices for diesel were, on average, similar to those for 95-octane gasoline in the different regions. The North had the biggest range of variation (around 17.9%), and the Algarve the smallest (6%).

1245. For diesel, the lowest price recorded was in the Central region (€1.147/litre), while the highest price (€1.386/litre) was recorded in the North.

Chart 77 – Range of variation the average pump price of diesel for road use in the last week of the third quarter of 2008 (em €/litre)



Source: Portuguese Competition Authority analysis based on data from the DGEG.

Fourth quarter of 2008

1246. In the last week of December, the average retail price of 95-octane gasoline was not significantly different between regions. The maximum difference recorded was 0.6 cents/litre.

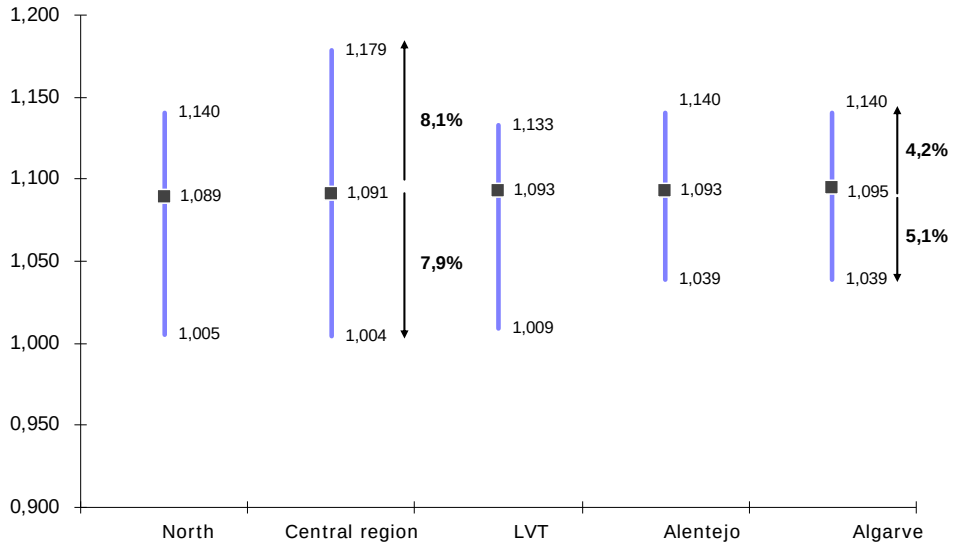
1247. As at the end of the other quarters of 2008, so at the end in the fourth quarter, the Algarve recorded the highest average price (€1.095/litre). The North and the Central region, at the end of December 2008, had the lowest average prices (€1.089/litre and €1.091/litre respectively).

1248. The ranges of variation (the difference between the lowest and the highest price charged for sales to the public) were different between regions during the last week of December. For 95-octane gasoline, the biggest range of variation in prices was recorded in the Central region (16.0%), and the region with the smallest range was the Algarve (10,3%).

1249. This quarter saw a substantial fall in the range of prices in the North for 95-octane gasoline.

1250. The Central region recorded both the lowest price for 95-octane gasoline (€1.004/litre) and the highest (€1.179/litre) for the same type of fuel.

Chart 78 – Range of variation the average pump price of 95-octane gasoline in the last week in the fourth quarter of 2008 (in €/litre)



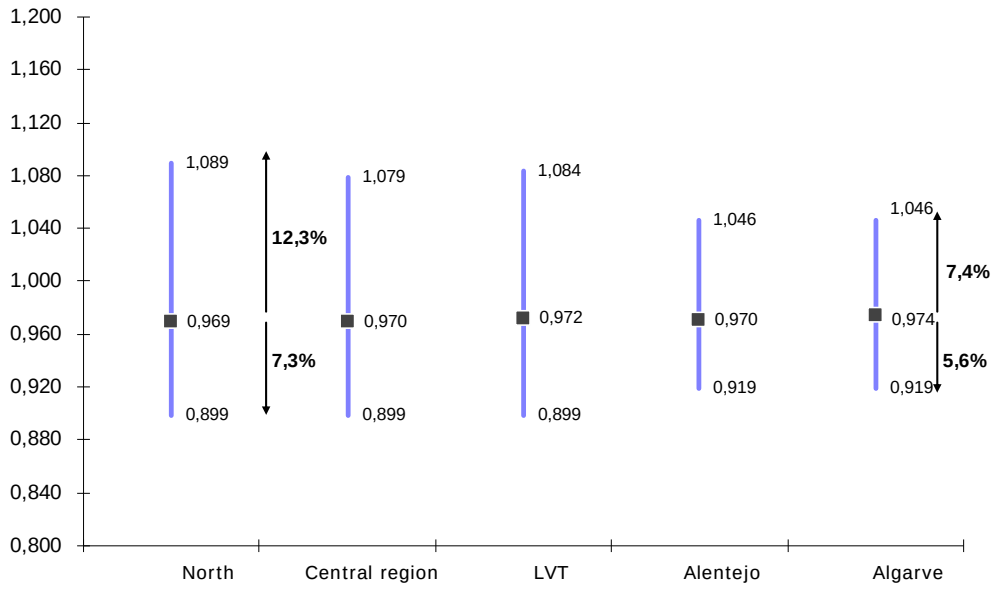
Source: Portuguese Competition Authority analysis based on data from the DGEG.

1251. For diesel, the average prices between regions were also not significantly different (0,5 cents/litre). The lowest average price was recorded in the North (€0,969).

1252. In the same way as for 95-octane gasoline, the ranges of variation for diesel were different between regions during the last week of December. The North had the biggest range of variation (around 20%), and the Algarve the smallest (13%).

1253. For diesel, the lowest price recorded was in the North, the Central region and the LVT (€0.899/litre), while the highest price (€1.089/litre) was recorded in the North.

Chart 79 – Range of variation in the average pump price of diesel for road use in the last week of the fourth quarter of 2008 (in €/litre)



Source: Portuguese Competition Authority analysis based on data from the DGEG.

Conclusion

1254. In general during the year, the average retail price in the regions of the North, Centro, LVT, the Alentejo and the Algarve were very similar for both types of fuel and there were no changes higher than 0.6 cents per litre in the weeks analysed.

1255. The range between the average retail price per region and the minimum and maximum price found in each region is defined by a very limited number of service stations, so the standard deviation in the various regions is also small.

1256. In particular the minimum prices in each region are fixed by supermarket service stations. For this reason, the biggest ranges de prices occur in regions where there is a bigger concentration of this type of service stations: Among these regions are the North, Central and LVT.

1257. Traditionally, the Algarve region has the highest average prices of all the regions, and the smallest price dispersion, a fact which is evidence of less competition between the operators than in the other regions of the country.

9.6.3. International comparisons between retail prices (the average pump price) – EU27

1258. After an analysis of average pump prices in Portugal and of the differences in these prices in the various regions of the mainland, it is important to present comparisons of international prices.

1259. The term of comparison used was the group of EU27 countries and the analysis covered the four quarters of 2008.

First quarter of 2008

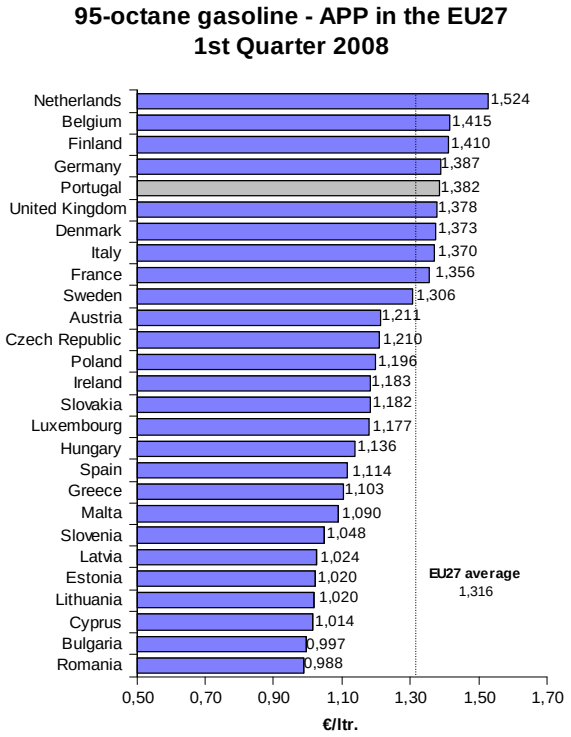
1260. There was a considerable disparity in prices between countries in the quarterly average of the average pump prices charged for 95-octane gasoline and for diesel in the EU27 in the first quarter of 2008.

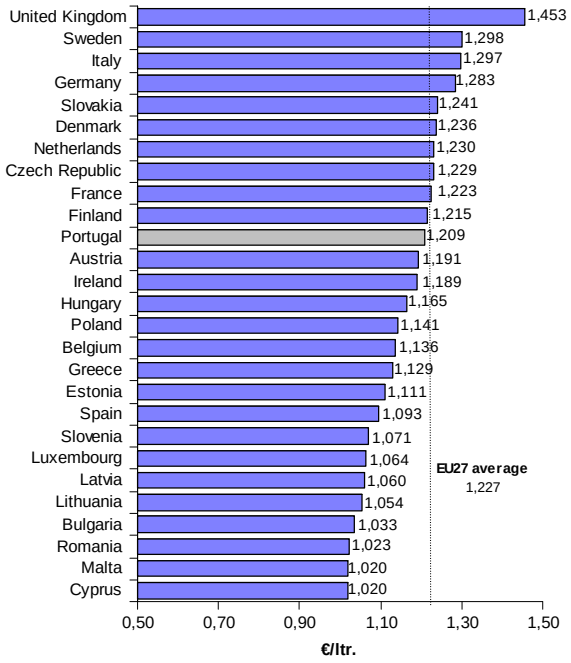
1261. For 95-octane gasoline, in quarterly terms, the difference between the highest average pump price (the Netherlands, at €1.524/litre) and the lowest price (Romania, at €0,988/litre) was 53.6 cents per litre.

1262. With diesel, the difference between the highest price (the United Kingdom, €1.453/litre) and the lowest (recorded in Cyprus, at €1.020/litre) was 43.3 cents per litre.

1263. The quarterly average for the average pump price of 95-octane gasoline in Portugal was €1.382/litre (above the EU average, which was €1.316) and the figure for diesel was €1.209/litre (below the EU average, which was €1.227).

Chart 80 – EU 27 comparison of quarterly average pump prices for 95-octane gasoline and diesel - First quarter de 2008 (in €/litre)





Second quarter 2008

1264. The disparity between prices stayed high in this quarter.

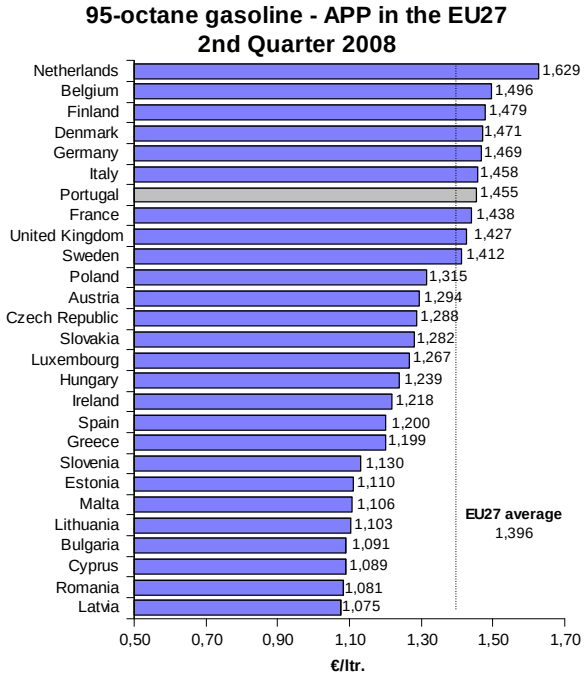
1265. For 95-octane gasoline in quarterly terms, the difference between the highest average retail price (the Netherlands, at €1.629/litre) and the lowest (Latvia, at €1.075/litre) was 55.4 cents per litre.

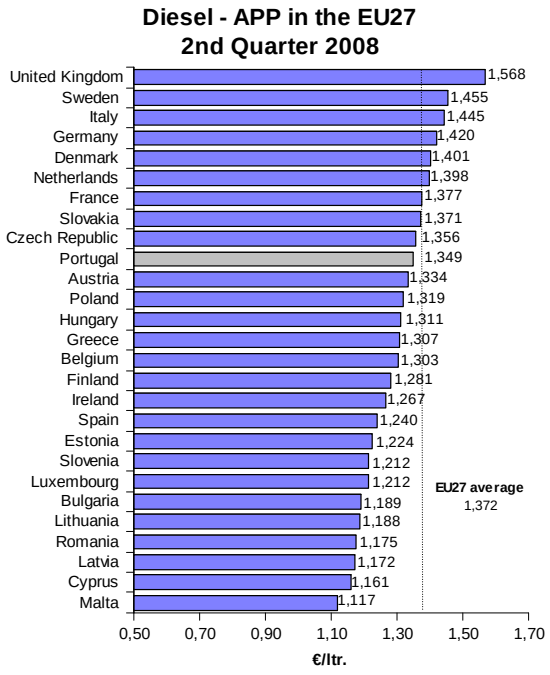
1266. For diesel in quarterly terms, the difference between the highest average pump price (the United Kingdom, at €1.568/litre) and the lowest (Malta, at €1.117/litre) was 45.1 cents per litre.

1267. During this quarter, the average pump price of 95-octane gasoline in Portugal was higher than the average, while diesel stayed below.

1268. 95-octane gasoline was sold at an average retail price of €1.455/litre (above the average, at €1.396) and diesel €1.349/litre (below the average, at €1.372).

Chart 81 – EU 27 comparison of quarterly average pump prices for 95-octane gasoline and diesel - second quarter of 2008 (in € / litre)





Third quarter of 2008

1269. The disparity between prices stayed high in this quarter.

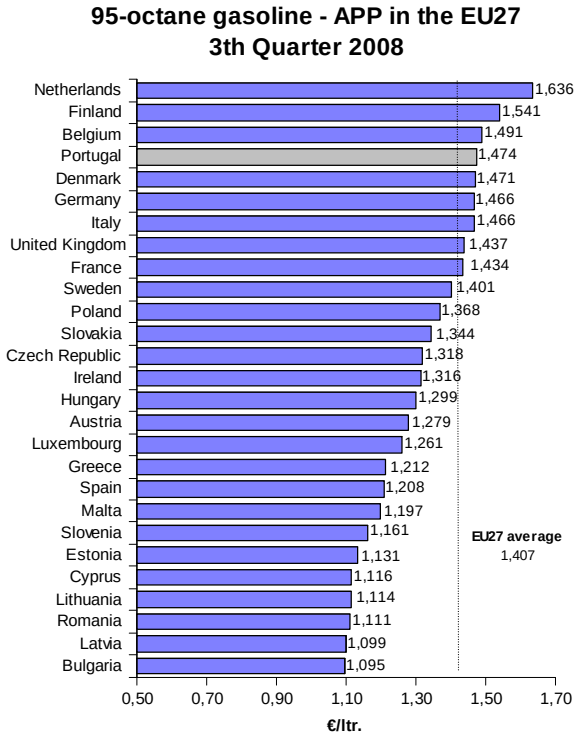
1270. Therefore, for 95-octane gasoline in quarterly terms, the difference between the highest average pump price (The Netherlands, at €1.636/litre) and the lowest (Bulgaria, at €1.095/litre) was 54.1 cents per litre.

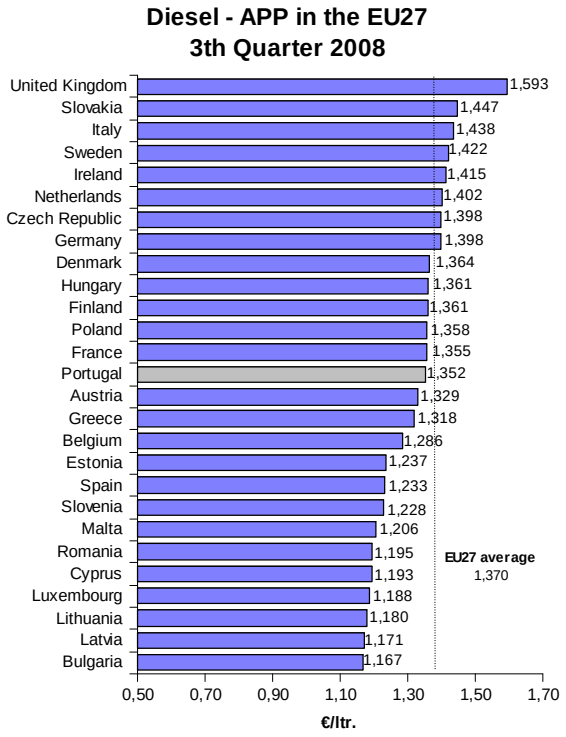
1271. For diesel in quarterly terms, the difference between the average retail price highest quarterly average (United Kingdom, at €1.593/litre) and the lowest (Bulgaria, at €1.167/litre) was €0.426 per litre.

1272. During this quarter, the average retail price of 95-octane gasoline was higher than the average, while diesel stayed below.

1273. 95-octane gasoline was sold at an average retail price in Portugal at €1.474/litre (above the average, €1.407) and diesel at €1.352/litre (below the average, €1.370).

Chart 82 – EU 27 comparison of quarterly average pump prices for 95-octane gasoline and diesel - third quarter of 2008 (in € / litre)





Fourth quarter of 2008

1274. The disparity between prices stayed high in this quarter.

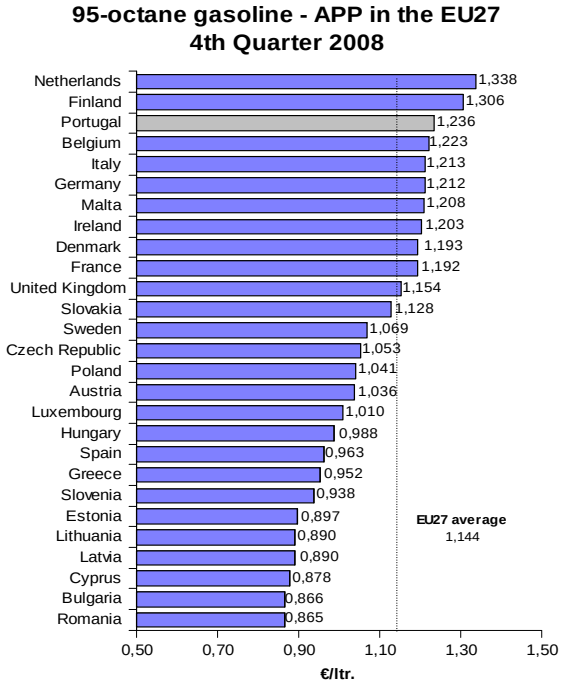
1275. For 95-octane gasoline in quarterly terms, the difference between the highest average retail price (the Netherlands, at €1.338/litre) and the lowest (recorded in Romania, at €0.865/litre) was 47.3 cents per litre.

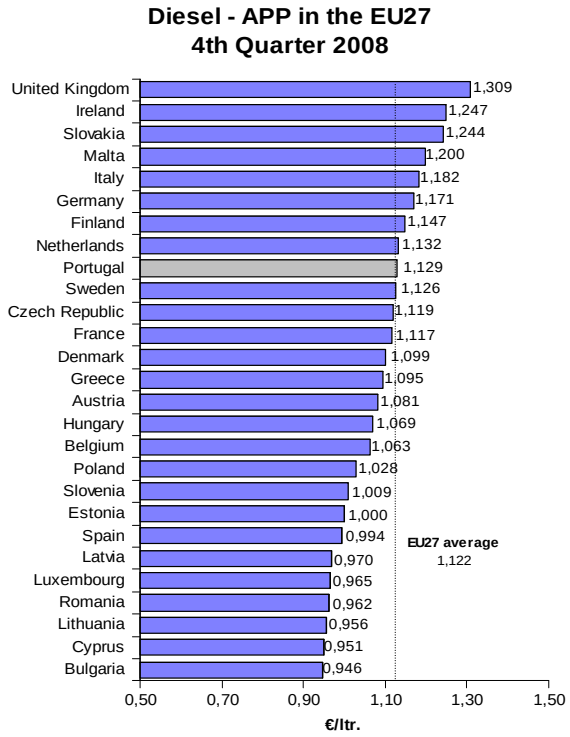
1276. For diesel in quarterly terms, the difference between the highest average retail price (United Kingdom, at €1.309/litre) and the lowest (Bulgaria, at €0.946/litre) was 36.3 cents per litre.

1277. During this quarter, the average retail price in Portugal of 95-octane gasoline stayed higher than the EU average and diesel moved above the average, which happened for the first time in the year.

1278. 95-octane gasoline was sold at an average retail price of €1.236/litre (above the EU average, which was €1.144) and diesel at €1.129/litre (above the average, which was €1.122).

Chart 83 – EU 27 comparison of quarterly average pump prices for 95-octane gasoline and diesel - fourth quarter of 2008 (in €/litre)





Conclusion

1279. During 2008, the annual average weekly pump price for gasoline in Portugal was higher than that of the EU27. The difference in absolute value between the national average and the EU27 average was around 7.9 cents per litre.

1280. During 2008, the annual average weekly pump price for diesel for road use, in Portugal was lower than that of the EU27. The difference in absolute value between the national average and the EU27 average was around 1.33 cents per litre.

9.6.4. The average retail prices before tax in Portugal (pre-tax prices)

1281. During 2007 and 2008, pre-tax prices in Portugal followed the changes in the ex-refinery prices and the bulk prices of diesel and of 95-octane gasoline.

1282. In specific terms, during the whole of 2007 and the first half of 2008, the pre-tax price of diesel for road use increased by more than 35 cents per litre and 95-octane gasoline by more than 25 cents per litre.

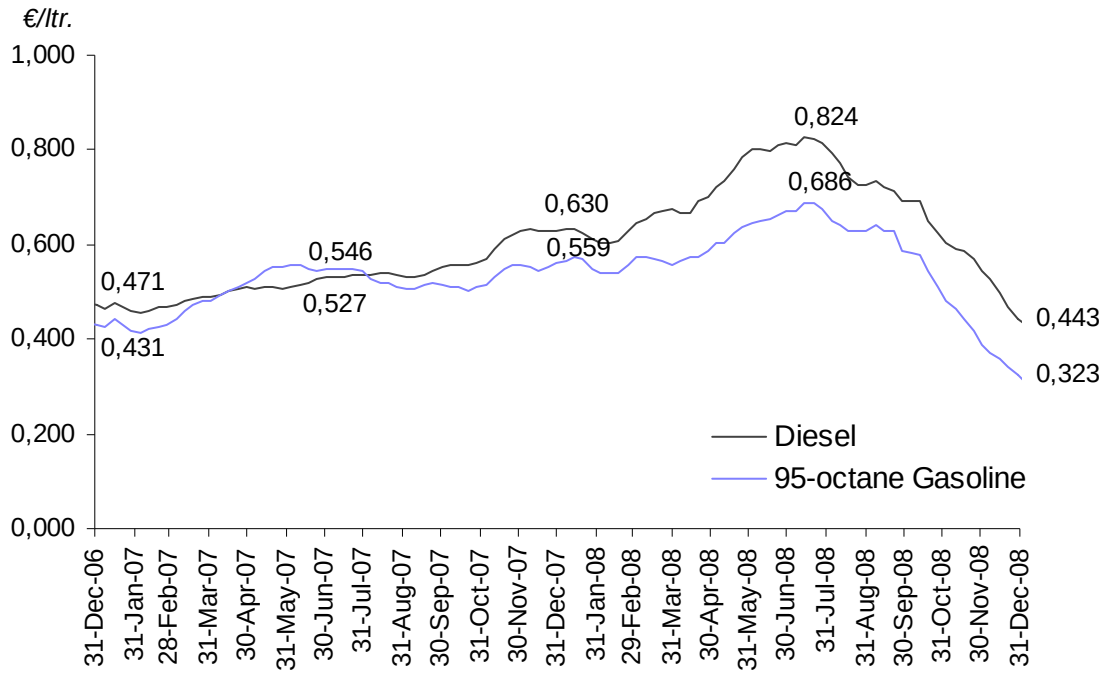
1283. Indeed, at the start of 2007, the pre-tax price of 95-octane gasoline was €0.431/litre and diesel for road use was €0.471/litre; at the end of 2007 these prices were €0.559/litre and €0.630/litre; and at the end of July 2008 they reached their maximum at around €0.686/litre and €0.824/litre.

1284. Only during the second half of 2008 was there a sudden fall in pre-tax prices for both types of fuel for road use, taking them lower than those recorded at the start of 2007.

1285. So, in the last week of 2008, the pre-tax price of 95-octane gasoline was €0.323/litre and diesel was €0.443/litre.

1286. These changes are illustrated in the chart below:

Chart 84 – Changes in pre-tax prices of fuel for road use (95-octane gasoline and diesel for road use) in 2007 and 2008



Source: European Comission.

95-octane gasoline

1287. The changes in pre-tax prices of 95-octane gasoline are detailed in the table below (and can be compared with the changes in the ex-refinery prices/cargo and the changes in the average pump price detailed in section 6.4 and subsection 9.6.1 of this Report; see also subsections 9.6.5 to 9.6.8):

Table 53 – Changes in the quarterly averages of weekly pre-tax prices for 95-octane gasoline in retail sales in Portugal in 2007 and 2008, in €/litre

	2007	2008	Change between year- on-year periods	Change between year- on-year periods (%)
1st Quarter	0.438	0.560	0.121	28%
2nd Quarter	0.530	0.619	0.089	17%
3rd Quarter	0.528	0.645	0.117	22%
4th Quarter	0.533	0.447	-0.087	-16%
Annual	**0.508**	**0.568**	**0.060**	**12%**
Change from 4Q2007 to1Q2008		0.026		
Change from 1Q2008 to 2Q2008		0.060		
Change from 2Q2008 to 3Q2008		0.025		
Change from 3Q2008 to4Q2008		**-0.198**		
Change from 4Q2007 to1Q2008 (%)		5%		
Change from 1Q2008 to 2Q2008 (%)		11%		
Change from 2Q2008 to 3Q2008 (%)		4%		
Change from 3Q2008 to4Q2008 (%)		**-31%**		

Source: Analysis by the Portuguese Competition Authority based on data from the European Commission.

Diesel for road use

1288. The changes in pre-tax prices of diesel for road use is detailed in the table below (and can be compared with the changes in the ex-refinery prices/cargo and the changes in the average pump price detailed in section 6.4 and subsection 9.6.1 of this Report; see also subsections 9.6.5 to 9.6.8):

Table 54 – Changes in the quarterly average of weekly pre-tax prices of diesel for road use in retail sales in Portugal in 2007 and 2008, in €/litre

	2007	2008	Change between year-on-year periods	Change between Year- on-year periods (%)
1st Quarter	0.470	0.635	0.164	35%
2nd Quarter	0.509	0.750	0.242	47%
3rd Quarter	0.535	0.761	0.226	42%
4th Quarter	0.595	0.576	-0.019	-3%
Annual	0.529	0.681	0.152	29%
Change from 4Q2007 to1Q2008		0.040		
Change from 1Q2008 to 2Q2008		0.116		
Change from 2Q2008 to 3Q2008		0.011		
Change from 3Q2008 to4Q2008		**-0.185**		
Change from 4Q2007 to1Q2008 (%)		7%		
Change from 1Q2008 to 2Q2008 (%)		18%		
Change from 2Q2008 to 3Q2008 (%)		1%		
Change from 3Q2008 to4Q2008 (%)		**-24%**		

Source: Analysis by the Competition Authority based on data from the European Commission.

9.6.5. Comparison of the changes in the differential between domestic retail prices and ex-refinery prices in Sines

1289. Following analysis of the changes in pre-tax prices for both types of fuel, it is important to check how these prices reflect the changes in prices in the markets upstream, among which are the ex-refinery prices analysed in section 6.4.

1290. In particular, it is important to check the changes in the differential between pre-tax prices in Portugal and ex-refinery prices. To the extent that this differential remained stable, it can be concluded that domestic pre-tax prices tracked ex-refinery prices very closely.

1291. In order to simplify the analysis, a comparison was made between the ex-refinery prices in Sines and domestic pre-tax prices. A comparison with the ex-refinery prices in Leça da Palmeira would not change the conclusions.

1292. From this analysis, it is clear that during 2007 the differentials between pre-tax prices and ex-refinery prices for both types of fuel stayed relatively constant, at around 12 cents per litre (as shown in the chart below).

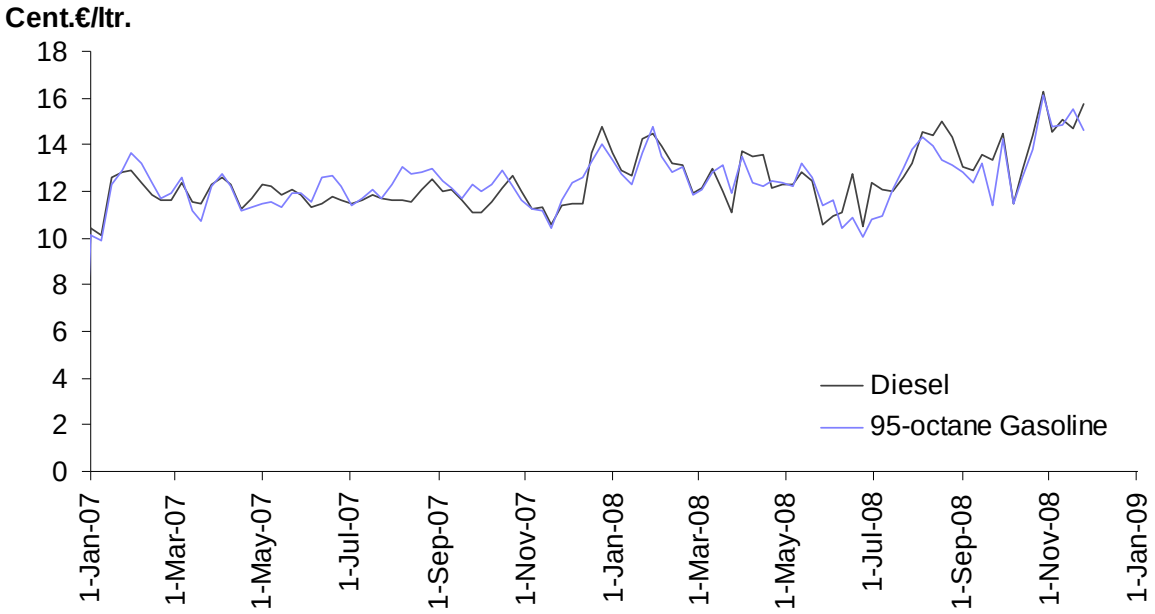
1293. During 2008 there was an increase in the volatility[156] of the absolute value of the differential.

1294. An increase in the volatility of this differential could be related to the increase in volatility, either of the ex-refinery prices, or of pre-tax prices or both, and given the existence of a time lag in the adjustment of the second to the first.

1295. A more detailed analysis of adjustment asymmetries is made in chapter 12.

1296. The differential between the pre-tax price of fuel for road use and the ex-refinery price increased in 2008 for both types of fuel, in particular in the last half de 2008, and this was characterised by the very rapid fall in the ex-refinery prices for both types of fuel. What happened was that the companies operating in the retail market in Portugal factored into their prices the reductions from which they had benefited in the prices for purchase of fuel with lags, an issue that is analysed in more detail in chapter 12.

Chart 85 – Evolution of the differential between the pre-tax retail prices of 95-octane gasoline and diesel and the ex-refinery prices in Sines in 2007 and 2008



Source: PCA analysis based on European Comission, Platts, Galp, Repsol, Esso, Cepsa, and BP data.

[156] Measured by the coefficient of the variation in the series of prices in question.

1297. In annual average terms, the differential between pre-tax prices and the ex-refinery price for 95-octane gasoline increased in 2008 by 0.8 cents per litre (as shown in the table below).

1298. As for diesel for road use, the increase in the differential between pre-tax prices and the ex-refinery price was higher, standing at around 1.5 cents per litre.

1299. When there is data for 2009 available, it will be important to see if this differential was simply the result of specific circumstances, stemming from the rapid fall in prices in the second half of 2008, or if it has become structural.

Table 55 – Differential of domestic pre-tax prices and ex-refinery prices in Sines in 2007 and 2008, in cents per litre

	95-octane gasoline	Diesel for road use
1Q2007	11.9	11.9
2Q2007	11.9	11.9
3Q2007	12.3	11.7
4Q2007	12.2	12.1
Média 2007	**12.1**	**11.9**
1Q2008	12.9	12.9
2Q2008	11.7	12.1
3Q2008	13.0	13.5
4Q2008	14.0	15,0
Average 2008	**12.9**	**13.4**
Change 2007-2008 (in cents/litre)	0,8	1.5
Change 2007-2008 (in %)	6.9%	12.5%

Source: Portuguese Competition Authority based on data from the European Commission, Platts, Galp, Repsol, BP, Cepsa.

9.6.6. International comparisons of retail prices before tax (pre-tax prices) – EU27

1300. Following on from the analysis of pre-tax prices in Portugal, the Portuguese Competition Authority undertook comparisons with international prices.

1301. The term of comparison used was the group of countries in the EU27 and the analysis was made for the four quarters of 2008.

95-octane gasoline

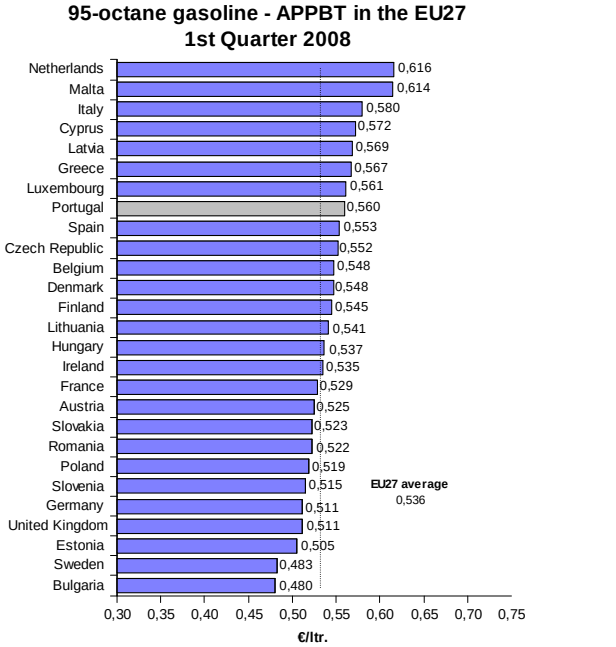
1302. On average, in the first quarter of 2008 in Portugal, for 95-octane gasoline, the pre-tax price was €0.560/litre, which compares with the average price of €0.536/litre recorded in the UE27.

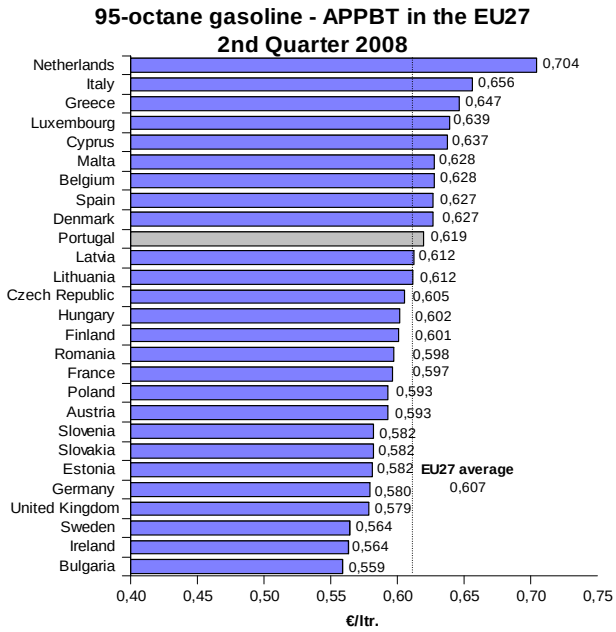
1303. In this quarter, the difference between the highest price (the Netherlands, €0.616/litre) and the lowest price (Bulgaria, €0.480/litre) was 13.6 cents (euro) per litre.

1304. On average, in the second quarter of 2008 in Portugal, for 95-octane gasoline, the pre-tax price was €0.619/litre, which compares with the average price of €0.607/litre recorded in the EU27.

1305. In this quarter, the difference between the highest price (the Netherlands, €0.704/litre) and the lowest price (Bulgaria, €0.559/litre) was 14.5 cents (euro) per litre.

Chart 86 – Pre-tax prices for 95-octane gasoline in the EU 27 during the first and second quarters of 2008





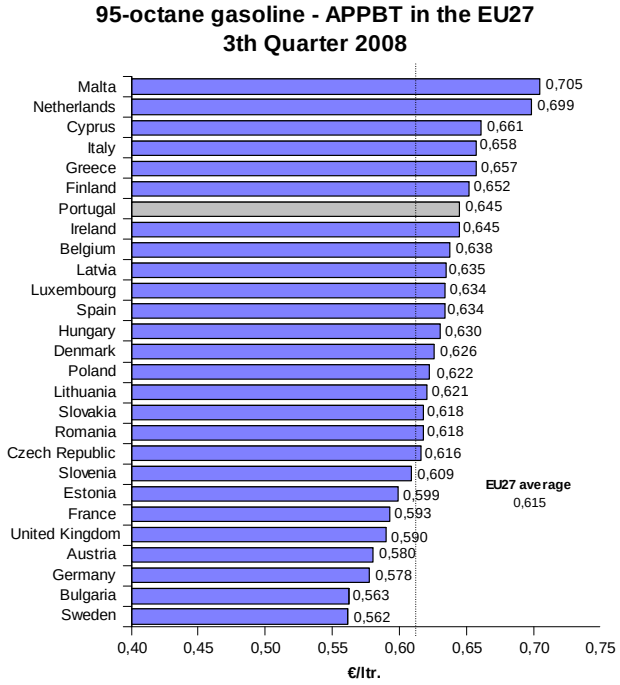
1306. On average, in the third quarter of 2008 in Portugal, the average pre-tax price for 95-octane gasoline was €0.645/litre, which compares with the average price of €0.615/litre recorded in the EU27.

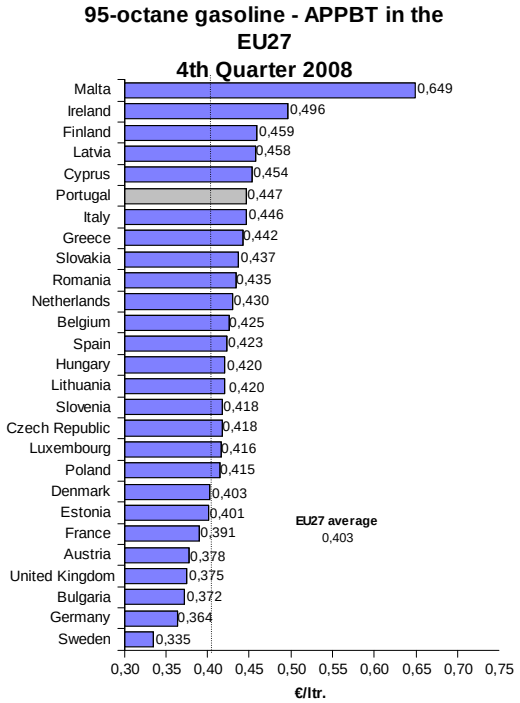
1307. In this quarter, the difference between the highest price (Malta, €0.705/litre) and the lowest price (Sweden, €0.562/litre) was 14.3 cents (euro) per litre.

1308. On average, in the fourth quarter of 2008, in Portugal, the average pre-tax price for 95-octane gasoline was €0.447/litre, which compares with the average price of €0.403/litre recorded in the UE27.

1309. In this quarter, the difference between the highest price (Malta, €0.649/litre) and the lowest price (Sweden, €0.335/litre) was 31.4 cents (euro) per litre.

Chart 87 – Pre-tax prices for 95-octane gasoline in the EU 27 during the third and fourth quarters of 2008





Diesel for road use

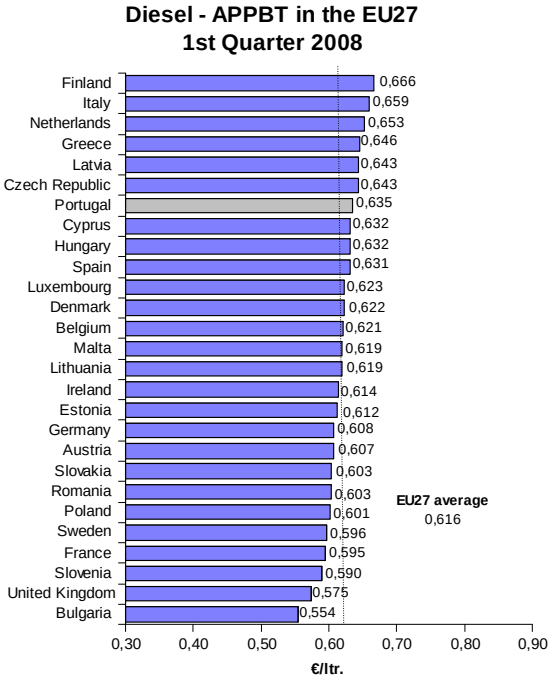
1310. On average, in the first quarter of 2008 in Portugal, the average pre-tax price for diesel was €0.635/litre, which compares with the average price of €0.616/litre recorded in the EU27.

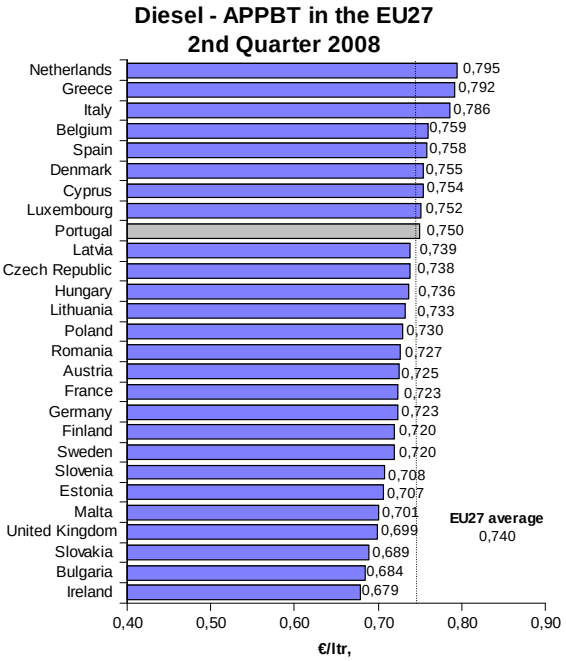
1311. In this quarter, the difference between the highest price before tax (Finland, €0.666/litre) and the lowest price (Bulgaria, €0.554/litre) was 11.2 cents (euro) per litre.

1312. On average, in the second quarter of 2008, in Portugal, the average pre-tax price for diesel was €0.750/litre, which compares with the average price of €0.740/litre recorded in the UE27.

1313. In this quarter, the difference between the price before tax highest (the Netherlands, €0.795/litre) and the lowest price (Ireland, €0.679/litre) was 11.6 cents (euro) per litre.

Chart 88 – Pre-tax prices of diesel in the EU 27, during 1Q 2008 and 2Q 2008





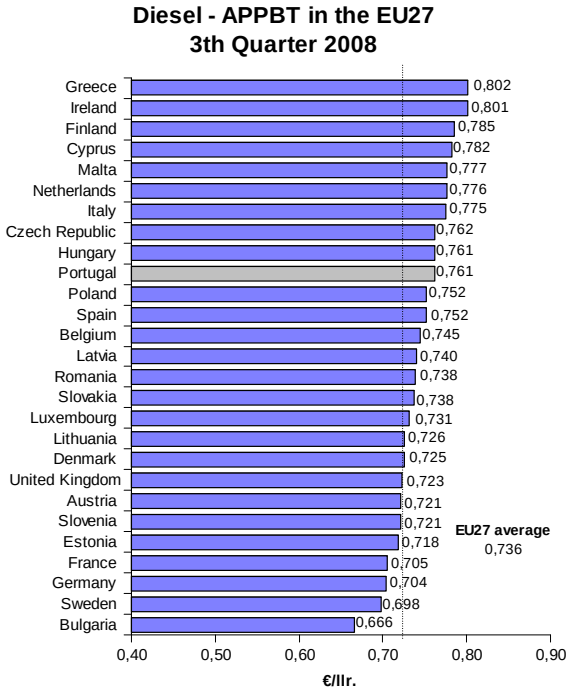
1314. On average, in the third quarter of 2008, in Portugal, the average pre-tax price for diesel was €0.761/litre, which compares with the average price of €0.736/litre recorded in the EU27.

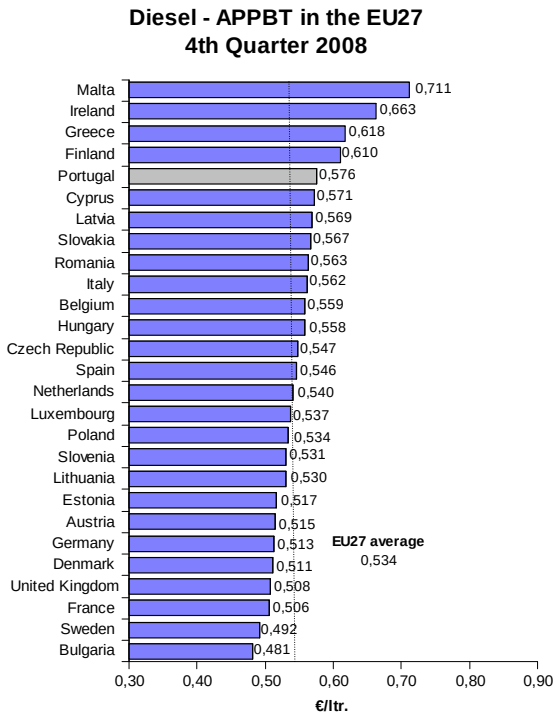
1315. In this quarter, the difference between the highest price before tax (Greece, €0.802/litre) and the lowest price (Bulgaria, €0.666/litre) was 13.6 cents (euro) per litre.

1316. On average, in the fourth quarter of 2008, in Portugal, the average pre-tax price for diesel was €0.576/litre, which compares with the average price of €0.534/litre recorded in the EU27.

1317. In this quarter, the difference between the highest price before tax (Malta, €0.711/litre) and the lowest price (Bulgaria, €0.481/litre) was 11.6 cents (euro) per litre.

Chart 89 – Pre-tax prices of diesel in the UE 27, during 3Q2008 and 4Q2008





Conclusion

1318. During 2008, the annual average weekly pre-tax prices of gasoline in Portugal were higher than the EU27. The difference in absolute value between the national average and that of the EU27 was around 2.75 cents per litre.

1319. Also during 2008, the annual average weekly pre-tax prices of diesel were higher than the EU27. The difference in absolute value between the national average and that of the EU27 was around 2.41 cents per litre.

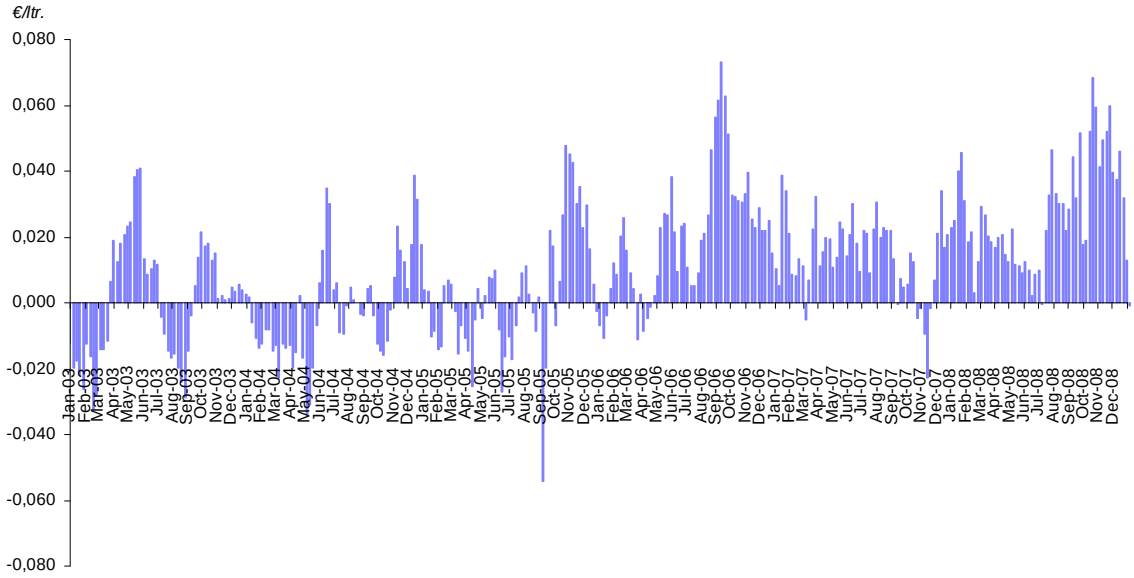
9.6.7. Changes in the differential of pre-tax prices compared with the EU27

1320. As analysed in the previous subsection pre-tax prices in Portugal for all the quarters of 2008, were higher than those of the EU27 for both types of fuel.

1321. In this subsection an analysis will be made of the temporal changes in the differential between domestic pre-tax prices and pre-tax prices in the EU27.

1322. During every week of 2008, pre-tax prices of 95-octane gasoline in Portugal were higher than those recorded in the EU27 by 2.36 cents/litre in the first quarter, by 1.27 cents/litre in the second, by 3.0 cents/litre in the third quarter and by 4.37 cents/litre in the fourth quarter of the year.

Chart 90 – Changes in the differential between pre-tax prices in Portugal and the EU27 for 95-octane gasoline since the last stage of liberalisation of the retail market (in € / litre)

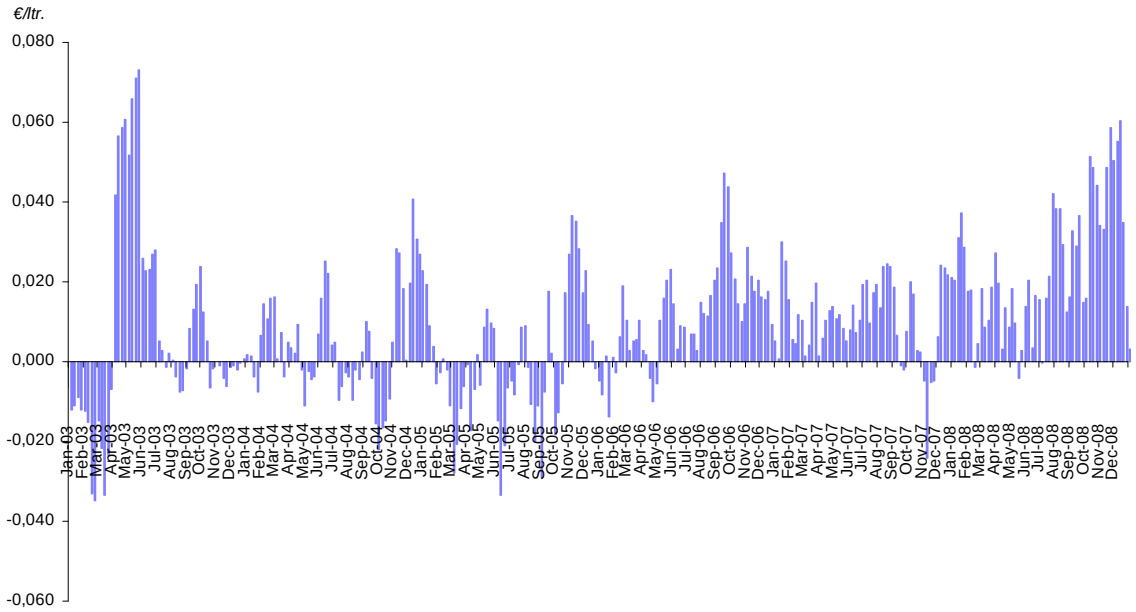


Source: Portuguese Competition Authority analysis based on data from the European Commission.
Note: Up to December 2007: Differentail calculated based on the EU15 average.
After January 2008: Differentail calculated based on the EU27 average.

1323. In 2008, pre-tax prices of diesel in Portugal were higher than those in the EU27, with the exception of two weeks when the figures were slightly lower than those recorded in the EU27.

1324. During every week in 2008, the domestic pre-tax prices of diesel were higher than those of the EU27 by 1.84 cents/litre in the first quarter, 1.09 cents/litre in the second, 2.51 cents/litre in the third, and 4.23 cents per litre in the final quarter.

Chart 91 – Changes in the differential between pre-tax prices pre-tax prices in Portugal and the EU27 for diesel for road use since the last stage of liberalisation of the retail market (in €/litre)



Source: Portuguese Competition Authority analysis based on data from the European Commission.
Note: Up to December 2007: Differentail calculated based on the EU15 average.
After January 2008: Differentail calculated based on the EU27 average.

1325. The pre-tax prices of 95-octane gasoline and of diesel for road use during 2008 were above the average pre-tax prices of these types of fuel in the EU27, with the differential worsening during 2008.

1326. Indeed, as can be seen in the table below, on average in 2007, the differential between the domestic pre-tax prices and the average of the EU27 was 1.45 cents per litre for 95-octane gasoline and 1.08 cents per litre for diesel. In 2008 this differential was around 2.75 cents per litre for 95-octane gasoline and 2.41 cents per litre for diesel.

Table 56 – Changes in the differential between the domestic pre-tax prices and the EU27 average in 2007 and 2008, in cents per litre

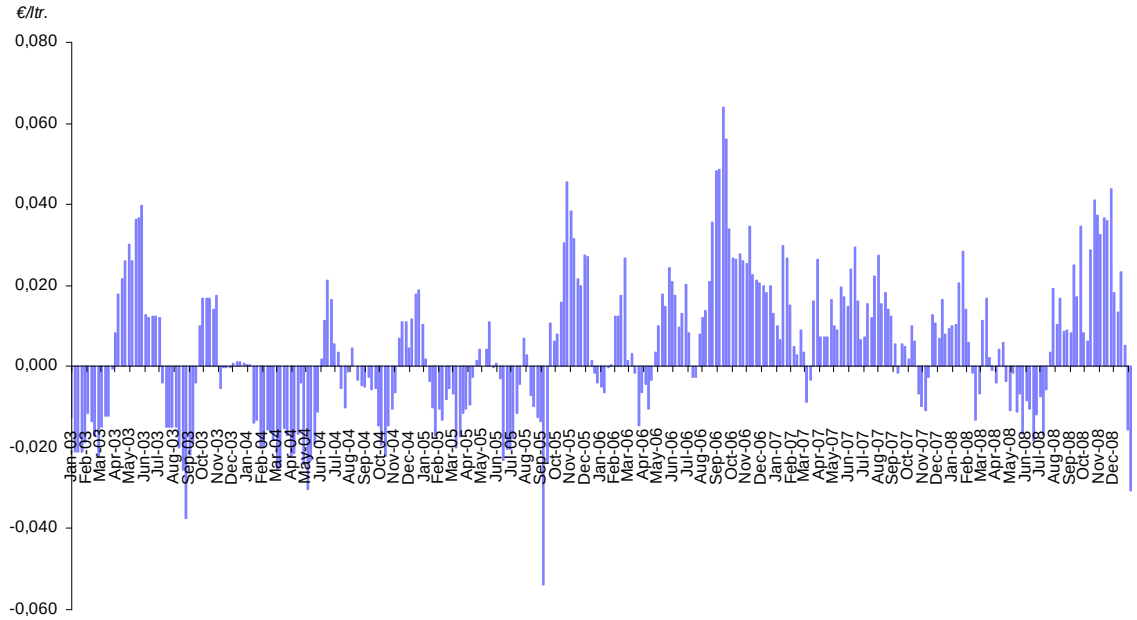
	95-octane gasoline	Diesel
1Q2007	1.59	1.14
2Q2007	1.76	0,92
3Q2007	1.66	1.49
4Q2007	0,82	0,77
Average 2007	**1.45**	**1.08**
1Q2008	2.36	1.84
2Q2008	1.27	1.09
3Q2008	3.00	2.51
4Q2008	4.37	4.23
Average 2008	**2.75**	**2.41**

9.6.8. Changes in the differential of pre-tax prices compared with Spain

1327. The differential between the domestic pre-tax prices and pre-tax prices recorded in Spain during 2007 and 2008 is smaller than which is found between the domestic pre-tax prices and of the EU27.

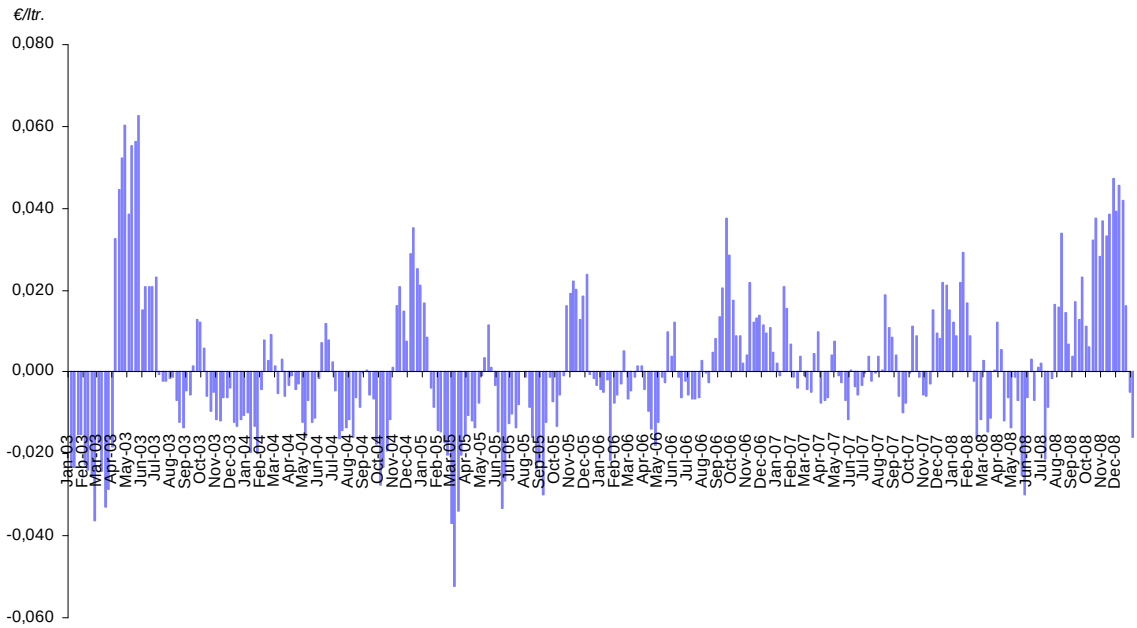
1328. In general during 2008, the domestic pre-tax prices were higher than in Spain. However, at the end of the first quarter and during almost all the second quarter of 2008, the difference was in fact favourable to Portugal for both types of fuel for road use (as can be seen in the charts below)

Chart 92 – Changes in the differential between pre-tax prices de Portugal and the de Spain for 95-octane gasoline from the last stage of liberalisation of the retail market (in € / litre)



Source: Portuguese Competition Authority analysis based on data from the European Commission.

Chart 93 – Changes in the differential between pre-tax prices de Portugal and the de Spain for diesel for road use from the last stage of liberalisation of the retail market (in € / litre)



1329. In terms of 95-octane gasoline, pre-tax prices in Portugal were higher than those recorded in Spain, em 0.64 cents/litre in the first quarter, 1.06 cents/litre in the third quarter the 2.36 cents/litre in the final quarter of the year. In the second quarter, as previously mentioned, they were 0.75 cents/litre lower.

1330. As for diesel for road use, pre-tax prices in Portugal were higher than those recorded in Spain, em 0.34 cents/litre in the first quarter, 0.95 cents/litre in the third quarter the 3.06 cents/litre in the final quarter of the year. In the second quarter, as previously mentioned, were lower by 0.74 cents/litre.

1331. These differentials show a fall in the case of 95-octane gasoline, but an increase in the case of diesel in the difference between pre-tax prices in Portugal and Spain compared with those seen in 2007.

1332. Indeed, as can be seen in the table below, on average, in 2007, the differential between the domestic pre-tax prices and those of Spain was 1.03 cents/ litre for 95-octane gasoline and 0.26 cents/litre for diesel. In 2008 this differential was around 0.83 cents/litre for 95-octane gasoline and 0.90 cents/litre for diesel.

Table 57 – Changes in the differential between domestic pre-tax prices and those of Spain in 2007 and 2008, in cents per litre

	95-octane gasoline	Diesel
1Q2007	1.06	0.37
2Q2007	1.42	-0.33
3Q2007	1.23	0.19
4Q2007	0.44	0.76
Average 2007	**1.03**	**0.26**
1Q2008	0.64	0.34
2Q2008	-0.75	-0.74
3Q2008	1.06	0.95
4Q2008	2.36	3.06
Average 2008	**0.83**	**0.90**

Source: Analysis by the Portuguese Competition Authority based on data from the European Commission.

1333. So, the significant difference between the average retail price in Portugal and in Spain can be justified not so much by the differentials between pre-tax prices in the two countries but fundamentally by the differences in terms of the tax burden.

1334. The difference is significant, since Portugal is close to the European average and Spain is near the lower limit – whether in terms of VAT (16% in Spain as against 21% until June 2008 and 20% thereafter in Portugal), or in terms of the special fuel tax (ISP) (40.7 cents/litre in Spain as against 58.3 cents/litre in Portugal for gasoline; 31.1 cents/litre in Spain as against 36.4 cents/litre in Portugal for diesel).

1335. Bearing in mind the levels of average prices in 2008, the simple impact of this fiscal difference translated in the year into an arithmetic difference in the average retail price between the two countries of around 25 cents/litre (around 23%) for gasoline and around 11 cents/litre (around 10%) for diesel.

Table 58 – Changes in the pre-tax prices, the average retail price, the average retail price *ceteris paribus*[157] in Portugal and Spain in the four quarters of 2008

		Gasoline				Diesel			
		1Q2008	2Q2008	3Q2008	4Q2008	1Q2008	2Q2008	3Q2008	4Q2008
	Pre-tax prices								
1	Portugal	0.560	0.619	0.645	0.447	0.635	0.750	0.761	0.576
2	Spain	0.553	0.627	0.634	0.423	0.631	0.758	0.752	0.546
3	Difference in euros	0.006	-0.007	0.011	0.024	0.003	-0.007	0.010	0.031
4	Difference in %	1.1%	-1.2%	1.7%	5.3%	0.5%	-1.0%	1.3%	5.3%
	APP								
5	Portugal	1.382	1.455	1.474	1.236	1.209	1.349	1.352	1.129
6	Spain	1.114	1.200	1.208	0.963	1.093	1.240	1.233	0.994
7	Difference in euros	0.268	0.255	0.266	0.272	0.115	0.109	0.119	0.135
8	Difference in %	19.4%	17.5%	18.0%	22.0%	9.6%	8.1%	8.8%	11.9%
9	**APP in Spain**	1.114	1.200	1.208	0.963	1.093	1.240	1.233	0.994
10	+ VAT, difference on the base price	0.048	0.052	0.042	0.033	0.047	0.053	0.043	0.034
11	+ Difference ISP	0.176	0.176	0.176	0.176	0.053	0.053	0.053	0.053
12	+ VAT, difference ISP	0.037	0.037	0.035	0.035	0.011	0.011	0.011	0.011
13	**APP in Portugal**, *ceteris paribus*	1.375	1.464	1.460	1.207	1.205	1.358	1.339	1.092
	Difference (13) - (9)								
14	In euros	0.260	0.264	0.252	0.244	0.111	0.118	0.106	0.098
15	As a percentage	23.4%	22.0%	20.9%	25.3%	10.2%	9.5%	8.6%	9.9%
	Difference (13) - (5)								
16	In euros	0.008	-0.009	0.014	0.028	0.004	-0.009	0.012	0.037
17	As a percentage	0.6%	-0.6%	0.9%	2.3%	0.3%	-0.7%	0.9%	3.3%

[157] This corresponds to the average pump price that would have been charged in Portugal if domestic pre-tax prices were identical to the Spanish, and with the Portuguese tax burden added to the price in Spain.

9.7. Changes in the gross margin for retail operations during 2008

1336. From the analysis carried out, it was possible to see that in operation involving retail sales of fuel for road use, there existed a very dispersed demand and one with little or no bargaining power, and a supply side with high levels of concentration, dominated by the main oil companies (see the analysis in sections 9.2 and 9.3).

1337. In addition, there are obstacles in the way of penetration, expansion and leaving the market at the level of retail sales in the network (as analysed in section 9.4).

1338. It was also clear, as described in section 9.6, that although the CODO and DODO type service stations can, in principle, define the prices for sale of fuel, the contract clauses (for example decisions on sale or on consignment) mean that the oil companies have control, direct or indirect, over the pricing policy in these service stations.

1339. The competition from the supermarkets at this level is still limited and very localised, and currently they account for less than 15% of the retail sales of fuel for road use in the network. Various other obstacles affect penetration of these operators, as previously analysed.

1340. For this reason, this Report analyses the changes in the gross margins in retail sales in the network in Portugal in 2007 and 2008.

1341. The gross margin corresponds to the difference between the purchase price of fuel (including the ex-refinery price and/or bulk price plus the cost of storage and transport up to the supply point) and the selling price publicised for fuel for road use.

1342. So, the gross margin must be calculated so that the operators can cover their costs and investments in the retail operations, such as the costs with rent and space, payroll costs and fixed capital invested, as well as other factors of lesser import.

1343. From the analysis carried out here by the Portuguese Competition Authority, it would seem that during 2007, gross margins in retail operations were 9.9

cents per litre for 95-octane gasoline and 9.4 cents per litre for diesel for road use (detailed in the chart below).[158]

1344. In 2008, there was an increase in the gross margin in retail sales of fuel for road use, in particular of diesel for road use.

1345. During 2008, the gross margins in retail operations were 10.8 cents per litre for 95-octane gasoline (+9,8%) and 11.2 cents per litre for diesel for road use (+20%).

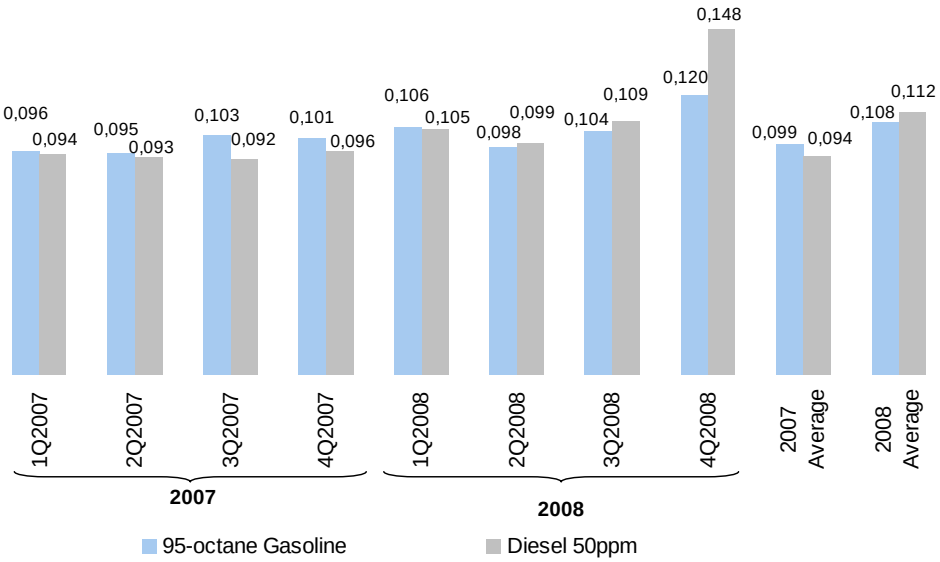
1346. The gross margin increased during the final quarter of 2008 for both types of fuel.

1347. Indeed, while in the third quarter of 2008 the gross margin of 95-octane gasoline was 10.4 cents per litre and for diesel it was 10.9 cents per litre, during the last quarter of 2008, these margins increased to 12 and 14.8 cents per litre respectively.

1348. The final quarter of the year was a period when the ex-refinery prices and the bulk prices were on an unbroken and sharp falling trend, and this impacted on the gross retail margin in this quarter.

[158] From previous analyses made by the Portuguese Competition Authority, and in spite of the big volatility of these costs measured on a unit basis (in euros/litre) bearing in mind the differences in the geographical location of the outlets, the kind of businesses involved together, and the level of competition in the local area, all of which can have a big impact, the estimate is that 40% of this margin on average is for payment of the costs mentioned above, with the other 60% being the net margin.

Chart 94 – Changes in the gross margin of retail operations of fuel for road use (95-octane gasoline and diesel for road use) in 2007 and 2008 (em € / litre)



Source: Portuguese Competition Authority analysis based on data from Galp, Repsol, Cepsa/Total and Esso.

9.8. Conclusions

1349. In Portugal, retail sales of gasoline and diesel for road use in service stations have a very concentrated supply side structure, with the four oil companies operating currently in the country (Galp, Repsol, BP and Cepsa) accounting for between 80% and 85% of total sales in 2007 and 2008.

1350. The other retail operators, among them the independents and the supermarkets had market shares of 7.3% and 9% respectively in 2007 and 7.7% and 12% in 2008. One salient point here is the 3% increase in the market share of the supermarkets.

1351. In this market, the recommended modal pump price does not differ in any relevant way for a number of reasons, among them the homogeneous nature of the product, the characteristics of demand in terms of the retail market ("atomized demand" and relatively inelastic), the transparency of the market along the value chain, the existence of structural connections between the main companies operating in the market (for example, the joint participation they have in the CLC) and multimarket contacts between the oil companies (import contracts; swap agreements; contracts for the provision

of logistical services; contracts for leasing storage space; and contracts for the supply of oil-based products – see subsection 6.3.2.2.5).

1352. As for the other operators in the retail business apart from the oil companies, the independent operators, who accounted for 8% of retail sales in 2008, do not charge prices very different from those of the main oil companies.

1353. In contrast, the supermarket service stations, which have been building up their market share, reaching around 12% in 2008, have been putting some competitive pressure on other service stations. They have been charging pump prices which, in 2008, reached up to a difference of 9 cents on average for diesel for road use and for gasoline compared with the recommended pump prices of the oil companies.

1354. However, the competitive pressure exerted by these operators is mitigated by the fact that they still have a very small network of service stations.

1355. Moreover, the agreements on special offers between some supermarket chains with a broad base in the domestic market and some of the main oil companies have led to smaller discounts in the sale of fuel than those offered by service stations run by supermarket chains with a broad base which do not have such agreements, and this has meant in practice that there is less competitive pressure from these independent operators – the supermarkets – in this market.

1356. The supposition underlying this conclusion is that these supermarket chains would, without such an agreement, set up their own network of service stations and offer substantial discounts on the pump price, since this has been the strategy followed by their main competitors.

1357. In other words, the competitive effect of supermarket penetration in retail sales has been influenced by the agreements that give supermarket customers a discount in the oil company's service stations.

1358. Long-lasting competitive conditions in retail sales of refined products are in general terms dependent on a logistics infrastructure available for supplies, and also, as an example, on access to import depots for storage, to pipelines and to distribution depots on reasonable and non-discriminatory commercial terms.

1359. In order to encourage more competition in retail prices, the following measures are important:

- Stimulating changes in the way prices are calculated for sale to wholesalers (CODO, DODO) and other clients off the network (bulk prices), so that what is charged is not determined by indexation to a price for sale to the public (used as a reference, recommended or maximum) on which there is a discount on the bulk margin, but based on a bulk price without discounts on retail prices or margins;
- Banning the definition and publicising of reference prices by the oil companies and associations that represent the sector, since this is not necessary nor desirable in an open market;
- Encouraging checks on and up-dating of information on the pump price of fuel for road use currently available on the DGEG[159] internet site, so as to ensure that the consumer gets information in real time, and on top of this increase the platform's flexibility, so as to allow automatic downloading of information on prices and places to mobile equipment (for example GPS, PDAs,...);
- Streamlining the licensing process for new service stations, for example by introducing rules for tacit approval with periods that cannot be extended, whatever the reason[160];
- Reinforcing inspections on the existence de placards with the prices of fuel visible in such a way that the consumer can decide whether to fill up in a particular service station before going in;
- Including as a positive factor in the licencing of new supermarkets the existence of a fuel supply nearby, the aim being to encourage the setting up of service stations near supermarkets as a way of creating more competitive pressure on the prices charged by the service stations in the oil companies' networks.

[159] On the last day of March 2008, in more than 10% of outlets, the most recent price reported referred to February or an earlier month. This situation may arise because of there have been no changes in prices at the outlet for more than a month, but it may also be because of failures by the outlet to update prices for the DGEG.

[160] In particular as far as town council approvals are concerned.

10. Retail sales of liquid fuel on the highways

10.1. Introduction

1360. The Portuguese Competition Authority made a separate analysis of retail sales of fuel in service stations on the highways.

1361. These retail sales included the sales both of diesel and gasoline.

1362. The retail sales of fuel for road use in service stations on the highways would seem to have different characteristics from the other retail sales of fuel for road use, on both the demand and the supply side.

1363. The differences in demand characteristics will be analysed in detail in section 10.2, and supply characteristics in section 10.3.

1364. Section 10.4 assesses the obstacles to penetration and expansion in retail sales of fuel for road use on the highways and section 10.5 looks at changes in prices and the differential between on and off the highways.

10.2. Characteristics of demand

1365. The demand for fuel in service stations on the highways has specific characteristics.

1366. The drivers who use highways want to benefit from the speed of traffic, integrated services (special service areas, rest areas, assistance on the road, and access to a supply of fuel 24 hours a day) and greater comfort on the journey.

1367. These characteristics of motorway users reveal a smaller sensibility prices, in particular to the prices of fuel.[161]

1368. In principle, motorway users do not go off the motorway to look for a service station with prices of fuel for road use lower than charged in the service stations on the motorway.

1369. The distinct nature of the demand for fuel in service stations on the highways is also associated with its seasonal character.

1370. This seasonal character is found in Portugal essentially in the month of August (a month for holidays and with a bigger influx of tourists). This time of the year is when the service stations on the highways make their highest

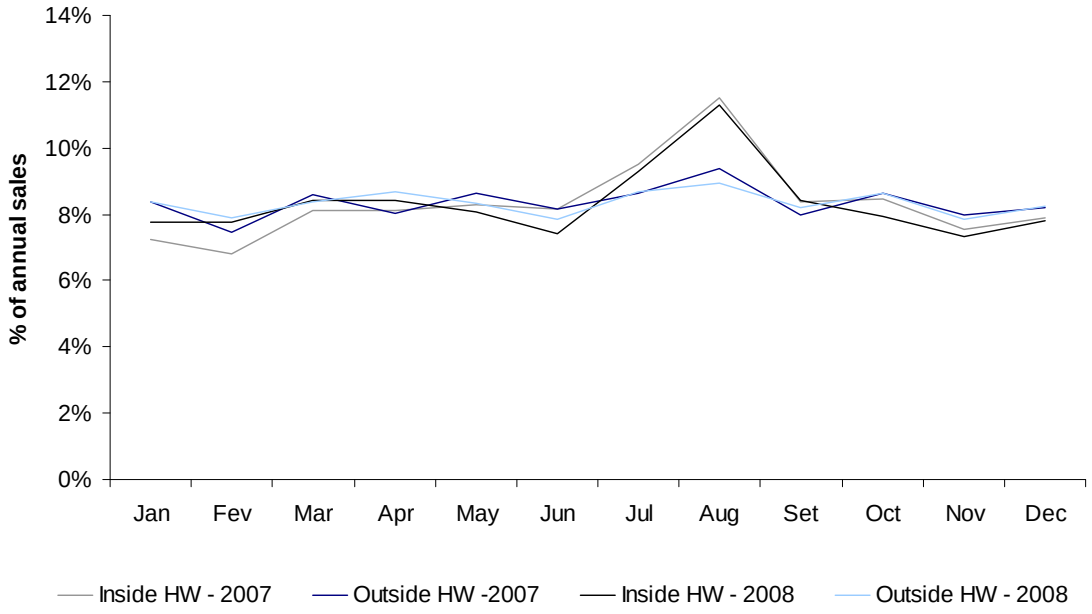
[161] See also the decision of the European Commission in the case COMP/M.1628 – TotalFina/Elf of 09.02.2000,

sales, not only in relation to sales off the highways but also in relation to the other months of the year.

1371. The month of August in 2007 and 2008 accounted for around 11% of the total sales for the year in motorway service stations, while in the service stations off the highways, the proportion of sales made in this month was only 9%.

1372. It should be noted that in the other months, both in the service stations on and off the highways, the proportion of monthly sales is around 8% of the annual total, very close to 8.33%, which would correspond to the monthly proportion of sales if distribution of sales were uniform over all the months of the year.

Chart 95 – Proportion of each month in the annual sales of fuel in service stations on and off the highways in 2007 and 2008 (gasoline and diesel for road use)



Source: Portuguese Competition Authority analysis based on data from the companies.

1373. In addition, the demand for fuel for road use on the highways is even more conditioned than off the highways, to the extent that the existing service stations tend to be spaced between 30-50kms apart, and therefore the range of options for the motorist is tendentially lower, especially when compared with what there is in built up areas off the highways.

1374. In short, the demand side for fuel on the highways is characterised by an even lower elasticity of demand to price, compared with places off the highways, by the seasonality of consumption and by the smaller number of options available.

1375. For this reason, some of the special offers made by the oil companies in service stations off the highways are not normally applicable to most of the motorway service stations. It should be added that on the supply side, the oil companies have to bear costs of investment and operating that are higher than off the highways, including the cost of the concession.

10.3. Characteristics of supply

1376. Also the supply of fuel for road use in service stations on the motorway has characteristics that are distinct from supply elsewhere.

1377. Only the oil companies operate in retail sales of fuel for road use in service stations on the highways.

1378. At the end of 2008, the oil companies operating on the highways were: Galp[162], BP, Repsol and Cepsa, with the spread detailed in the table below.

[162] In 2007, the number of operators on the highways was higher than in 2008: Galp, BP, Repsol, Esso and Cepsa. In 2008 the operations of Esso in Portugal were acquired by the Galp Energia Group. Therefore all the elements in this section refering to Galp Energia Group include the Esso operaions, unless otherwise stated.

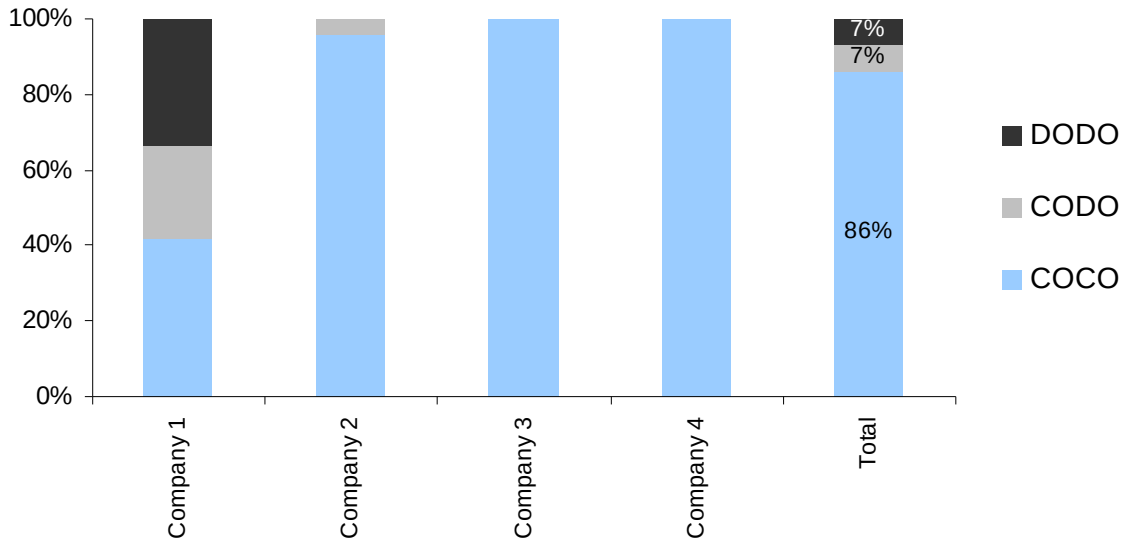
Table 59 – Presence of the oil companies per motorway at the end of 2008

	Galp	BP	Repsol	Cepsa
A1	x	x	x	
A2	x			x
A3	x			x
A4	x		x	
A5	x			
A6	x		x	x
A7	x	x		
A8	x	x	x	x
A9			x	
A11		x		
A12	x			
A13	x			
A15		x		
A17			x	
A21		x		
A22	x			x
A23	x			x
A25	x	x	x	
A29		x	x	
A41		x		

Source: Public information - DGEG and motorway concessionaires.

1379. The oil companies operate on the highways, essentially through COCO type service stations, though there are a few of the CODO and DODO type (see Chart below).

Chart 96 – Relative proportion of COCO, CODO and DODO in service stations on the highways of the four oil companies operating in Portugal in 2008



Source: Companies.

1380. They therefore have direct control over the commercial policy of their service stations on the highways relating to the sale of fuel.

1381. The average sales per service station on the highways are between 20% and 30% higher than average sales of a service station off the motorway.

1382. Once the overall differences between the supply of retail sales of fuel on and off the highways have been set out, it is important to assess, in specific terms, the representative nature of each oil company in the sales of fuel on the highways.

1383. To this end, the Portuguese Competition Authority calculated the relative proportion of each of the operators in terms of how many service stations they had in 2008 (see Table below).

Table 60 – Relative proportion of each oil company in the total number of service stations on the highways in 2008

	Relative proportion of each operator in the total number of service stations on highways (2008)
Galp	41%
BP	21%
Repsol	19%
Cepsa/Total	19%
Aggregate	**100%**

Source: Public information – DGEG and motorway concessionaires.

1384. In 2008, Galp had the biggest number of service stations on the highways (41%), followed by BP with 21%, Repsol with 19% and Cepsa with 19%.

1385. The level of concentration is for this reason particularly high, and higher than in the retail sales off the highways where, in spite of everything, the independents and the supermarkets account for around 20% of the total sales for 2008.

1386. Even so, the biggest operator has a relative proportion that is very similar to what it has in the retail sales off the highways.

1387. In spite of the fact that the country's motorway network is generally speaking interconnected, the flows of vehicles on the highways are clearly more intense on specific routes than others, apart from the fact that the

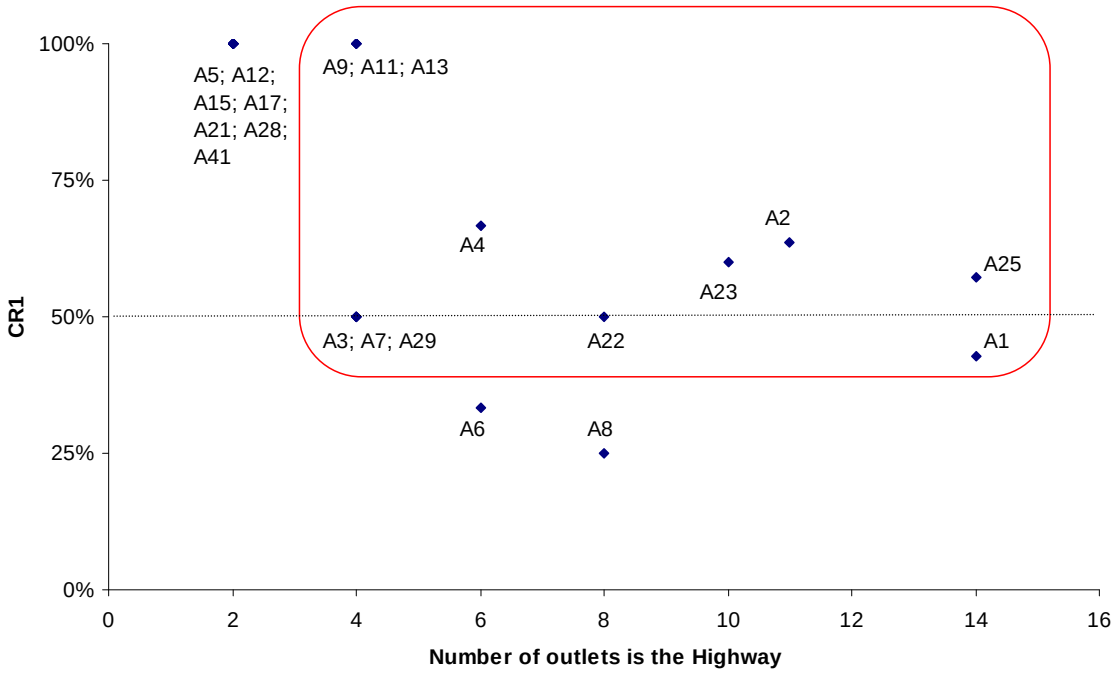
connections between highways are interrupted by stretches of road that are part of the urban fabric (normally ring roads around the large cities).

1388. So, in spite of the connections that exist between the highways, the competition between service stations is not so intense wherever they are within the overall motorway network.

1389. For this reason, it is important not only to assess the overall proportion of each operator throughout the network of highways, but also to assess the competitive situation on each motorway. It is relevant here particularly to detect those cases where a company has a very significant relative proportion of the service stations on a specific motorway.

1390. In a simplistic way, the number of service stations could be considered as a proxy[163] for the bigger/smaller number of kilometres of a motorway (see Chart below).

Chart 97 – Relative proportion of the oil company with the biggest number of service stations on the highways in terms of the total number on the highways in 2008



Source: Portuguese Competition Authority analysis based on published data from the DGEG and concessionaires.

[163] In some cases this also reflects the fact that this is a recent motorway where not all the service stations slated have yet been opened.

1391. The highways A5, A12, A15, A17, A21, A28 the A41 have only two service stations (one on each side) and therefore only one oil company is operating service stations here.

1392. It is also worth mentioning the case of the A17 (Marinha Grande - Aveiro) where in spite of the fact that there are currently two service stations selling fuel under the Repsol brand, there are four more service stations of the same brand due to be opened during 2009, making, therefore, um total of 6 service stations with the same brand.

1393. In the cases of the A9, A11 the A13, although there are only four service stations on each of the highways, they are all operated under the same brand.

1394. Each of these three highways has distinct characteristics that need to be studied.

1395. In the case of the A9 (CREL), there are four service stations under concession to Repsol, but the motorway is relatively short (around 35kms) and therefore does not differ substantially from those other short highways where there is only one operator, and there is less relevance from the point of view of gauging competitive conditions.

1396. In the case of the A11 (Apúlia - Amarante), the concession for this motorway is in the hands of Aenor, over a stretch of around 80kms, and the four service stations here are under concession to BP, and two additional service stations are set to open during 2009, both with the same operator (in Guimarães).

1397. In the case of the A13 (Almeirím - Marateca), this motorway stretches for 91kms, and is under concession to Brisa. The four service stations here are operated by Galp, a fact which reveals a high concentration for a considerable stretch of motorway.

1398. The A4, A2, A23 and A25 highways also have high levels of concentration, with one oil company having more than 50% of the service stations.

1399. On the A4, the level of concentration is high, but even so its relatively short stretch (around 60kms) moderates the effect of the high concentration.

1400. In the cases of the A2, A23 and A25, a competitive situation could be considered more complex.

1401. On the A2 (Lisbon – Algarve), one of the main highways in the country, covering 240kms, the main operator is Galp, with 64% of the service stations with one other operator (Cepsa) holding the remaining 36%.

1402. Add to this the fact that traffic on these highways has very seasonal characteristics.

1403. The A23 (Torres Novas – Guarda) is similar to the A2, but with the opposite proportion of operators. Here, it is Cepsa that holds 60% of the service stations and Galp the other 40%.

1404. This is also a very long motorway (around 217kms) and therefore the high levels of concentration are a concern from the competition standpoint.

1405. The A25 (Aveiro - Vilar Formoso) is a relatively long motorway (204kms) and around 60% of the service stations belong to Galp, with 29% held by BP and 14% by Repsol.

1406. There are four highways where one operator holds 50% of the service stations: the A3, A7, A29 and A22.

1407. In the cases of the A3, A7 and the A29, this situation merely reflects the fact that the highways have only four service stations (two on each side) and therefore the relative proportion of 50% in fact means that there are a variety of operators.

1408. In the case of the A22 (Lagos - Vila Real de Santo António) the situation is different. This is a route covering 133kms with a total of eight service stations. Of this total, 50% of the service stations are held by Galp and the other 50% by Cepsa.

1409. And to this level of concentration we can add the fact that the only motorway that the A22 joins is the A2, where the levels of concentration are also high and where the operators are exactly the same (Galp and Cepsa).

1410. In terms of the A1, which is the motorway with the biggest amount of traffic in the country, the levels of operator concentration are also high, although not as high as on most of the other highways.

1411. On this motorway, 43% of the service stations belong to Repsol, 29% to Galp and 29% to BP.

1412. The A6 and the A8 are the highways in Portugal with the least concentration.

1413. The table below gives a schematic analysis of supply previously presented by the Portuguese Competition Authority:

Table 61 – Relative proportion of each operator in the service stations on each motorway in 2008 (including on the highways with more than two service stations and where the proportion of the biggest operator is in excess of 40 %)

	Group 1 – 100%			Group 2 – Between 100% the 50%			
	A9 (CREL)	**A11**	**A13**	**A4**	**A2**	**A23**	**A25**
BP	0%	100%	0%	0%	0%	0%	29%
Galp	0%	0%	100%	67%	64%	40%	57%
Repsol	100%	0%	0%	33%	0%	0%	14%
Cepsa/Total	0%	0%	0%	0%	36%	60%	0%
Aggregate	100%	100%	100%	100%	100%	100%	100%

	Group 2 – 50%				Group 3 – Between 40% the 50%
	A3	**A7**	**A29**	**A22**	**A1**
BP	0%	50%	50%	0%	29%
Galp	50%	50%	0%	50%	29%
Repsol	0%	0%	50%	0%	43%
Cepsa/Total	50%	0%	0%	50%	0%
Agregado	100%	100%	100%	100%	100%

10.4. Obstacles to penetration and expansion

1414. The conditions for penetration in the market for sale of fuel on the highways are considerably different from the market off the motorway.

1415. In order to operate a service station on the motorway, an authorisation must be obtained. This takes the form of a sub-concession from the company responsible for the management of the motorway (or directly from the State for those highways not the subject of concession).

1416. For this purpose, tenders are put out for consultation with market operators, and sites are allocated as a function of the capacity of the candidate to match the specific tender documents.

1417. These tender documents impose investments and levels of service that have to be guaranteed by the operators.

1418. Normally, the draft contracts for the concession/sub concession of the service areas are subject to government approval.

1419. The concessions are awarded for long periods, generally from 25 to 30 years, and it is noticeable that in many cases the expiry date for running the service stations coincides with the expiry date of the concession for the motorway where they are located.

1420. This situation contributes to maintaining the positions of the various oil companies, apart from being an important factor limiting the penetration of new operators, who have to wait for a number of years before they have the chance to find a place on the existing highways.[164]

1421. Even after the long concession periods, the operator who has run the service station up to then is in a better position, since he knows the operating conditions for a service station on that site and has therefore a comparative advantage over the others when the new tender is opened or there is an award of a new concession on the site concerned.

1422. The exceptions to this are the new highways, where tenders for concession may still be opened.

1423. It does not seem probable, however, in the medium term, that enough new concessions will be open to be awarded for there to be a relevant penetration in the retail sales of fuel on the highways by operators not yet there.

1424. It must also be said that there are cases where concessions for service stations were awarded without a public tender, merely through a consultation process involving a few operators, a situation which should be avoided.

1425. In short, apart from the barriers to entry in the retail sales of fuel off the highways, in the retail sales on the highways there are pertinent additional obstacles (length of the concessions) which are have an impact on competition between companies.

[164] In terms of competition analysis, it cannot be excluded that each motorway may form an autonomous market in retail sales of fuel.

10.5. Differences in average retail prices on the highways and on other retail sites

1426. The Portuguese Competition Authority analysed the differences in the average pump price between service stations located on and off the highways in order to assess the impact on the operators in retail sales of fuel for road use on the highways of the structure of demand, analysed in section 10.2, of concentration in the market, analysed in section 10.3 and of the impact of the obstacles to penetration, detailed in section 10.4.

1427. This analysis relates to the last weeks of each quarter of 2008.

1428. At the end of all the quarters of 2008, the highest average retail prices of 95-octane gasoline and diesel were recorded in service stations on the motorway.

1429. In the case of 95-octane gasoline at the end of the first, second, third and final quarters of 2008, the average retail price recorded in motorway service stations was €1.390/litre, €1.527/litre, €1.404/litre and €1.089/litre respectively.

1430. These prices when compared with those recorded in the same period off the highways are higher by 0.6 cents per litre in the first quarter, by 0.6 in the second, by 0.3 in the third and by 0.8 in the fourth.

1431. The situation is similar for diesel. At the end of the first, second, third and final quarters of 2008, the average retail price recorded in motorway service stations was €1.266/litre, €1.436/litre, €1.273/litre and €1.097/litre respectively.

1432. These prices when compared with those recorded in the same period off the highways are higher, by 0.7 cents per litre in the first quarter, by 0.7 in the second, by 0.3 in the third, and by 0.5 in the fourth.

1433. The difference between the prices charged on the highways and off the highways has two facets: (i) the average price is higher on the highways compared with the price charged in other places; and (ii) the range of prices is much lower in the service stations on the highways than in service stations in other places.

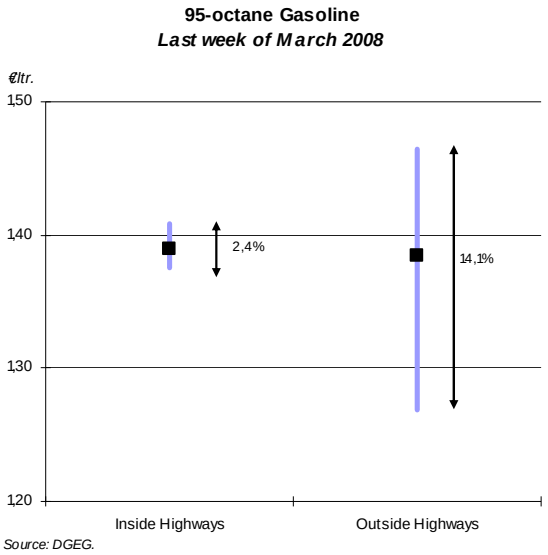
1434. This difference was particularly evident in all four quarters of 2008 and is expressed in the charts below.

1435. In terms of 95-octane gasoline, at the end of the first quarter of 2008, the range of prices on the highways was 2.4% (*vs.* 14.1% off the highways), at the end of the second quarter it was 1.2% (*vs.* 15.5% off the highways), at the end of the third quarter 3.6% (*vs*. 16.8% off the highways) and finally, at the end of the final quarter of 2008 the range of prices on the highways was 2.7% (*vs*. 16.0% off the highways).

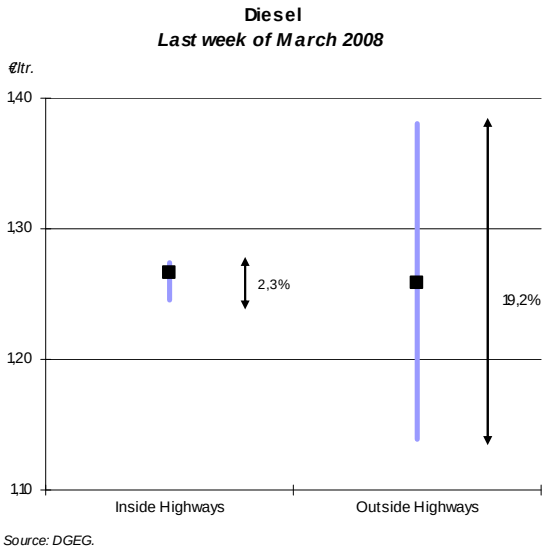
1436. In the case of diesel for road use, at the end of the first quarter of 2008, the range of prices on the highways was 2.3% (*vs*. 19,2% off the highways), at the end of the second quarter it was 1.6% (*vs*.. 8% off the highways), at the end of the third quarter 3.9% (*vs*. 18,7% off the highways) and finally, at the end of the final quarter of 2008 the range of prices on the highways was 3.0% (*vs*. 19.6% off the highways).

1437. In short, the price of both types of fuel was higher on the highways (0.3 to 0.8 cents per litre in the case of 95-octane gasoline the 0.3 to 0.7 cents per litre in the case of diesel), and the range of prices between service stations on the motorway was very low (1.2% to 3.6% in the case of 95-octane gasoline and 1.6% to 3.9% in the case of diesel, by comparison with 14.1% to 16.8% in the case of 95-octane gasoline and 8% to 19,6% in the case of diesel off the highways).

Chart 98 – Comparison between the average retail price in service stations on and off the highways in the last week of each quarter of 2008

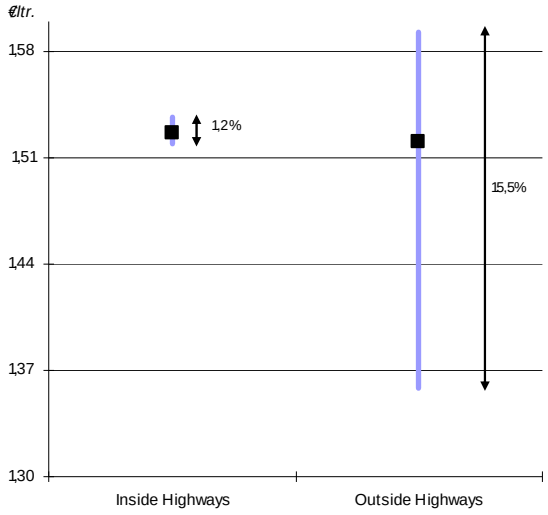


Source: DGEG.



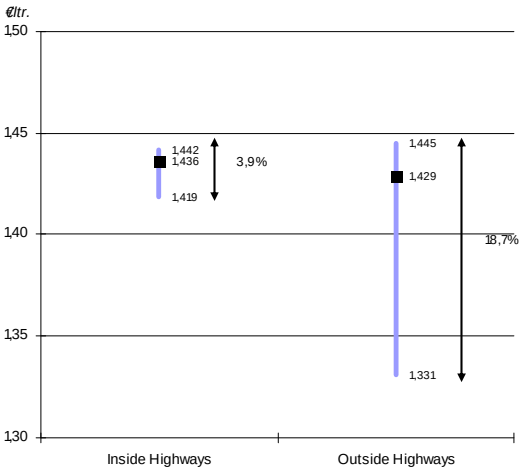
Source: DGEG.

95-octane Gasoline
Last week of June 2008



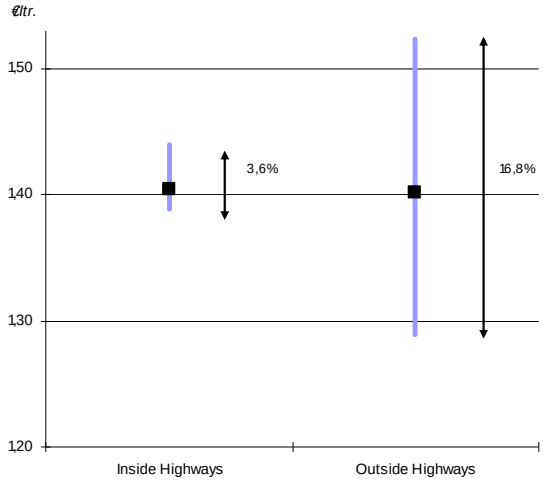
Source: DGEG.

Diesel
Last week of June 2008



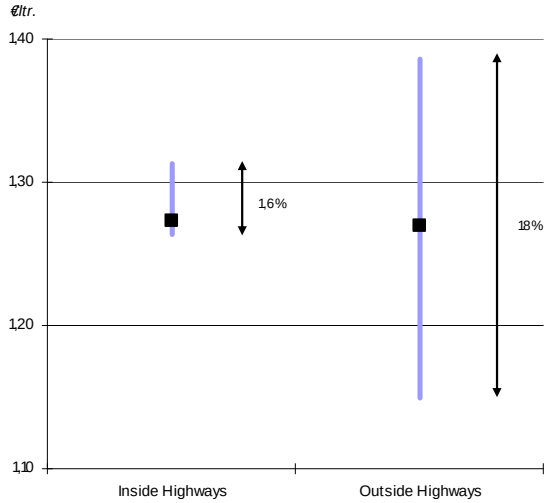
Source: DGEG.

95-octane Gasoline
Last week of September 2008



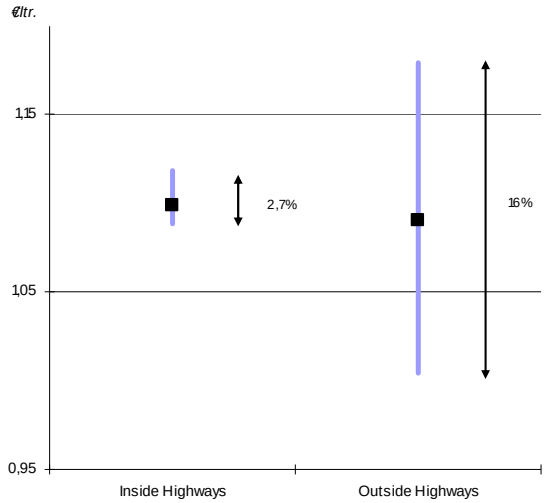
Source: DGEG.

Diesel
Last week of September 2008



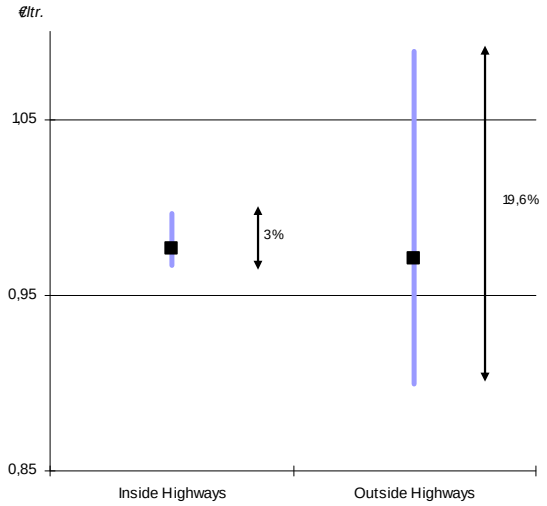
Source: DGEG.

95-octane Gasoline
Last week of December 2008



Source: DGEG.

Diesel
Last week of December 2008



Source: DGEG.

10.6. Conclusions

1438. Retail sales of fuel on the highways are typified by a level of competition that is limited by certain factors, both on the demand side and on the supply side.

1439. On the demand side, consumer sensitivity to prices is low (relatively inelastic demand.

1440. As previously mentioned, the demand for fuel in service stations on the highways has specific characteristics – the choice of a rapid journey, no traffic holdups, comfort, and with the possibility of getting other services (meals and snacks, rest and so on).

1441. The inelasticity of demand is also determined by the financial costs and the time associated with getting off the motorway to find another service station, and by the fact that there is low perception of - or people do not even know about- alternatives to the service stations on the highways, mainly on long journeys.

1442. These effects are reinforced by the limited capacity of vehicle fuel tanks, a fact that means drivers have to fill up when travelling on the motorway, especially on long journeys.

1443. On the supply side, there is a high level of concentration, with the four oil companies operating in Portugal being the only operators selling their brands on motorway service stations.

1444. Se the prices charged in these service stations are higher on average than those charged in the service stations off the highways, though it is also true that the costs of running the operation are higher.

1445. The service stations on the highways show a different pattern of supply from service stations off the highways, due in part to commitments on the tenders for the concessions.

1446. To date, there is no supply in this part of the market from independent operators or supermarkets.

1447. All these factors together contribute towards a market structure with specific characteristics where there are few incentives for competition between prices.

1448. From the point of view of competition, seven highways deserve attention: the A17, A11. A2, A22, A23, A25 and the A1.

1449. The A17 and the A11 are relatively recent highways and currently have few service stations. However, there are new outlets due to open.

1450. In 2009 there will be six service stations on each one. On each motorway all the existing service stations will belong to the same operator, Repsol on the A17 and BP on the A11.

1451. Drivers travelling on these highways therefore have no alternative: they have to buy one of the two brands.

1452. In the case of the A2 and A22 highways, there is the same situation as described above, plus the fact that the two are interconnected.

1453. In the case of the A2, which runs for 240kms, 64% of the service stations belong to Galp and the other 36% to Cepsa. On the A22 the spread is 50% for Galp and 50% for Cepsa.

1454. In addition to these points, there is the fact that traffic on these highways is highly seasonal, and this may lead to incentives for companies there to increase prices on these occasions.

1455. On the A23, which runs for 217kms, the service stations are shared between Cepsa (with 60%) and Galp (with 40%).

1456. Again, the fact that a relatively long stretch is shared by only two operators, and precisely the same ones that share two other long highways (the A2 and the A22), may lead to added incentives for parallel conduct between the oil companies operating there.

1457. The A25 runs for more than 200kms, and has 14 service stations with three operators, but 60% of the service stations belong to Galp, with the others in the hands of BP and Repsol.

1458. As a last point, on the A1, the motorway with the biggest volume of traffic in Portugal, running for more than 300kms, there are 14 service stations, with 43% of the service stations being Repsol, 29% Galp and 29% BP.

1459. In short, the level of concentration, the small number of operators, and the existence of barriers to penetration (regulatory and economic) are factors that lead to less competitive pressure in the market, in particular on the A17, A11, A2, A22, A23, A25 and A1.

1460. As well as the obstacles to penetration previously mentioned, there is the length of the concession periods (variable between 20 and 30 years).

1461. In order to ensure bigger competitive pressure in the motorway service station market, a number of actions should be considered.

1462. In the first place, shorter periods for motorway service station concessions, compatible with the period needed for a return on the investment made to gain a position in the market.

1463. The reduction in periods should relate to the initial period of the concession and for any and all renewals.

1464. In the second place, and in a similar way to what happens in the retail market off the highways, it is important to create the conditions needed for third party operators, and not just oil companies, to operate on the highways.

1465. In the third place, it should be ensued that subsequent service stations on the same motorway should be in the hands of operators of different brands whenever there are clear and positive benefits for the consumer.

1466. This last point was already the subject of a Recommendation by the Portuguese Competition Authority in 2004 on the fuel sector, but it is not clear whether this has been the case in more recent concession procedures (for example in the case of the A17).

11. Parallel behaviour in the determination of final pump prices at the local market level

11.1. Introduction

1467. For the present analysis, we consider weekly data (Thursday closing time) on effective final consumer prices for traditional diesel and 95-octane (IO95) gasoline over a sample of 2016 pumps, located in the Portuguese mainland[165], over the three years period 2004-2006.[166] These pumps are identified by location (municipality), pump type (highway, hypermarkets, and others), and brand.[167]

1468. We consider 13 brands in the analysis, namely:

(i) The so-called "major brands" from oil companies: Galp, Repsol, BP, Cepsa,[168] Agip, and Esso;

(ii) Three "white brands" (or "white pumps") from hypermarkets: The Musketeers (ITMI, with brands *Intermarché* & *Ecomarché*), E. Leclerc, and Carrefour; and

(iii) Four "minor brands" from independent operators: Alves Bandeira, Cipol, Gaspe e Lubridão (see Table below).

1469. The econometric methodology is panel-based with fixed effects specific to each brand and which further controls for inter-pump heterogeneity other than the "brand effect" (section 11.2).

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[165] Since we do not consider the Autonomous Regions of Açores and Madeira, given their specific tax and pump price regimes, the "national territory" refers here and henceforth to the Portuguese mainland.

[166] This analysis is restricted to this three year period (2004-2006), because the available data for 2007 is not directly comparable with that of the previous years, as that year does not include some relevant operators considered in the past years data. Accordingly and given the high degree of complexity related with the compilation and treatment of this type of data, disaggregated across 2016 pumps and fuels, the inclusion of the years 2007 and 2008 is left for further research. Notwithstanding, econometric results suggest that the inclusion of these two years is not likely to change the conclusions of this analysis.

[167] This data is as reported by DGEG (*ex vi* § 2nd of the National Ordinance No. F-1423/2003, of 31 December).

[168] Although the exclusive control of Cepsa by Total dates only from October 2006, up to 45% of Cepsa's capital was already controlled by Total before that date. For this reason, we consider "Cepsa" as the aggregated Cepsa and Total pump networks. It should also be noted that Agip and Esso were acquired by Galp in September and October 2008 respectively.

Table 62 – Sampled pumps, discriminated by brand and by brand type

	No. Pumps	Per brand type	Over total
Total	**2016**		**100%**
Major brands	**1728**	**100%**	**85.7%**
Galp	786	45.5%	39.0%
Repsol	363	21.0%	18.0%
BP	271	15.7%	13.4%
Cepsa	239	13.8%	11.9%
Agip	54	3.1%	2.7%
Esso	15	0.9%	0.7%
Minor brands	**196**	**100%**	**9.7%**
Alves Bandeira	91	46.4%	4.5%
Cipol	83	42.3%	4.1%
Gaspe	17	8.7%	0.8%
Lubridão	5	2.6%	0.2%
White pumps	**92**	**100%**	**4.6%**
ITMI	78	84.8%	3.9%
Leclerc	11	12.0%	0.5%
Carrefour	3	3.3%	0.1%

Source: Initial DGEG 2004 sample.

1470. Given the available information and apart from final pump prices, we consider the following elements:

(i) The geographical division of the national territory into the NUTS-III and NUTS-II classifications, with this latter disentangling between the main inland regions of the North, Centre, Lisbon, Alentejo, and Algarve; [169]

(ii) The residential population per municipality, according to the 2004 INE (National Statistical Institute) census;

(iii) The number of pumps per brand, municipality, and NUTS, from which it is possible to infer an estimate of each brand's market share in terms of the number of (sampled) pumps, over the entire national territory (see Table 62 above) and across regions (municipality and NUTS), together with estimates of the corresponding Herfindahl-Hirschmann concentration indexes;

(iv) The geographical area where there is at least one (hypermarket) white pump, both the specific municipality area and the area of that municipality together with all the neighbouring municipalities; and

(v) The pump type as disentangled between pumps located in highways (with tolls), in fast ways (similar to highways, but toll-free), and pumps located in

[169] "NUTS" stands for the Nomenclature of Territorial Units for Statistics (from the French original designation "*Nomenclature d'Unités Territoriales Statistiques*"). It is an EC geocode standard for referencing the administrative divisions of the EU Member States (*cf.* EC Regulation No. 1059/2003, of 26 May). The Portuguese NUTS (I, II, and III) classification is as published in the Decree-Law No. 204/2002, of 5 November. Since the publication of this legislation, the previous NUTS-II Region of Lisbon – "Lisboa e Vale do Tejo" (LVT) – changed to "Region of Lisbon", which includes nowadays the regions of Great Lisbon and the Setúbal Peninsula.

border municipalities with Spain, with these latter controlling for the so-called "border effect"[170].

11.2. Inter-brand pump price differentiation

1471. For each fuel (diesel and IO95 gasoline), econometric estimation[171] is performed at the level of each one of the 278 municipalities, each one of the 28 NUTS-III, as well as over the entire national territory. Estimations performed at the level of each NUTS-III and over the entire national territory use municipalities as geographic differentiation controls.

1472. From this set of estimates, per region and per fuel, we infer the empirical distribution of the fixed effect estimates – per brand, geographic area, and pump type –, as well as its main statistics: mean, dispersion (standard deviation), minimal and maximal values, median, and its confidence interval at the standard 95% probability level (*i.e.*, the interval delimited by the 2.5% and 97.5% percentiles of this empirical distribution). Estimation results are, notably, presented in terms of these confidence intervals.

1473. Concerning geographic differentiation of final pump prices, results reveal that (see Table 63 below):

(i) National pump prices are characterized by a weak geographic differentiation, below 1 cts/lt across NUTS-III and below 2.5 cts/lt across municipalities;[172]

(ii) Pump prices over the Lisbon NUTS-III do not exceed, on average, other NUTS-III prices by more than 0.32 cts/lt.[173] Regarding inter-municipality price differentiation, when compared with the Lisbon municipality, prices in other municipalities do not go more than 1.63 cts/lt below Lisbon's prices; and

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[170] Actually, the existence of a "border" effect is not consistent with the fuel tax differential between Portugal and Spain, which is sufficiently high for national operators not to dispose of margin to outweigh such tax differential. In particular, according to October 2008 information from the EC DG TREN, considering national APPBT (average retail price before tax) for diesel and IO95 gasoline, on average over that month, together with that month's VAT and excise taxes in Spain and Portugal, we have that the total tax differential between Portugal and Spain amounts to, on average over that month, 11.2 cts/lt and 26.3 cts/lt in the cases of diesel and gasoline respectively, close and well above the respective national gross retail margins for those fuels, between 11 and 13 cts/lt, observed up to October 2008.

[171] The proposed econometric approach is detailed in Appendix 1.

[172] From the quarterly AdC Newsletters on the liquid fuel market monitoring, one can draw the same conclusions on the weak geographic price differentiation, but across NUTS-II.

[173] Because of the large degree of panel heterogeneity, implicit to the large cross-sectional dimension (2016 pumps) of our data, as well as the potential omitted variables problem, the present statistical results must be interpreted as average results, subjected to those cautious remarks.

(iii) Pump price volatility is lower the larger the geographic area, being lower among NUTS-III than among municipalities, as reflected by the dispersion values and the 95% confidence intervals amplitude. In particular, this latter amplitude from NUTS to municipalities, more than doubles in the case of gasoline (from 1.11 to 2.92 cts/lt) and gets around four times larger in the case of diesel (from 0.54 to 2.15 cts/lt).

Table 63 – Inter-region (national) pump price differentiation, relatively to the Lisbon NUTS(-III) and the Lisbon municipality (€ cts/lt)

		Mean	Dispersion	Min	**2.5%**	Median	**97.5%**	Max
IO95	NUTS	0.34	0.39	-0.27	**-0.27**	0.24	**0.84**	1.72
	Municipality	0.80	0.79	-1.53	**-0.46**	0.63	**2.46**	3.13
Diesel	NUTS	-0.01	0.15	-0.32	**-0.32**	0.02	**0.22**	0.30
	Municipality	-0.50	0.57	-2.57	**-1.63**	-0.52	**0.52**	1.87

Note: The columns "2,5%" e "97,5%" are the lower and upper limit of the 95% confidence interval respectively, "Min" and "Max" denote, respectively, the minimal and maximal values, and "Dispersion" its standard deviation.

1474. Regarding pump type price differentiation, we observe that (see Table 64 below):

(i) Highway (with toll) pump prices are, on average, higher than in other pumps;

(ii) Pumps in toll-free highways tend, however, to price lower than other pumps;[174] and

(iii) There is a (slight) "border effect", but only in the case of diesel.

Table 64 – Pump type price differentials, in toll highways (toll) and in toll-free highways (no toll) in comparison with standard roadways, as well as in border municipalities (border) in comparison with no border municipalities (€ cts/lt)

		Mean	Dispersion	Min	**2.5%**	Median	**97.5%**	Max
IO95	Toll	0.47	0.57	-0.23	**-0.11**	0.33	**1.49**	1.76
	No toll	-0.64	0.40	-1.37	**-1.19**	-0.58	**-0.10**	0.04
	Border	-0.25	0.48	-0.83	**-0.83**	-0.27	**0.63**	0.63
Diesel	Toll	0.44	0.54	-0.20	**-0.09**	0.23	**1.31**	1.82
	No toll	-0.42	0.48	-1.16	**-1.15**	-0.38	**0.27**	0.63
	Border	-0.62	1.16	-3.08	**-3.08**	-0.27	**0.84**	0.84

[174] The inexistence of tolls, as opposed to usual toll-highways, may imply a lower local market power (and by highway distance) of pumps in such ways than the existing one in toll-highways.

1475. Concerning the major issue of this analysis on the inter-brand price differentiation in each local market, we observe that (see Table 65 below):

(i) Brands whose average pump prices are the closest to Galp are the minor ones (independent operators) followed by the remaining major oil companies, Repsol, BP and Total/Cepsa (denoted in Table below by "R, BP, T/C"), whose average price differentials when compared with Galp oscillate in the intervals (-1.92, 1.62) cts/lt and (-1.88, 1.45) cts/lt in the cases of IO95 gasoline and diesel respectively, *i.e.* roughly between 1.6 and 1.9 cts/lt above and below Galp's pump prices respectively;

(ii) Pump price differentiation tends to be lower among minor brands than among oil companies', at the levels of both their dispersion and the amplitude of the corresponding 95% confidence intervals;

(iii) Hypermarkets' white pumps tend to price lower than remaining brands, on average, between 2.48 and 6.70 cts/lt in the case of gasoline and between 2.89 and 8.44 cts/lt in the case of diesel;

(iv) Across brands, oil companies price differentials relative to Galp's can go up to 2 cts/lt, on average, below this brand's price, with such a differential reaching the extreme minimal value of -4.12 cts/lt in the case of diesel. Oil companies' prices also go up to 1.78 cts/lt, on average, above those of Galp.

Table 65 – Average inter-brand price differentials relatively to Galp (excluding toll-highways pumps), € cts/lt

Table 65, Panel A: By brand types

		Mean	Dispersion	Min	**2.5%**	Median	**97.5%**	Max
IO95	Oil companies	0.02	0.89	-4.12	**-1.92**	0.03	**1.62**	2.14
	R, BP, T/C	0.05	0.76	-2.07	**-1.54**	-0.02	**1.40**	2.14
	Minor	0.04	0.61	-1.18	**-1.12**	0.09	**1.10**	1.40
	White	-4.26	1.06	-6.70	**-6.70**	-4.02	**-2.48**	-2.28
IO95	Oil companies	-0.08	0.83	-2.89	**-1.88**	-0.07	**1.45**	3.38
	R, BP, T/C	-0.07	0.77	-2.89	**-1.88**	-0.06	**1.45**	2.75
	Minor	0.00	0.63	-1.51	**-1.26**	0.04	**0.81**	1.75
	White	-4.77	1.54	-8.44	**-8.44**	-4.48	**-2.89**	-2.57

1476. It is worth noting that the lower prices charged at hypermarket pumps, which on average, are between 2 to 8 cts/lt below the remaining brands' prices, during the considered period (2004-2006)[175], cannot be seen as an appropriate counterfactual to the inter-brand price differentials analysis since hypermarkets' core business is not related with retail sales of liquid fuels.

[175] More recent information, from 2008, suggests that hypermarkets' liquid fuels are, on average, sold at a price 8 cts/lt below the remaining brands in the business (see Section 9.5.3 above).

1477. Hypermarkets core business is related with the large network distribution of general food consumer goods and an associated high diversity of services, with sales of liquid fuels by these retailers representing a subsidiary activity. Hypermarkets liquid fuel stations thus benefit from a higher degree of price competitiveness than standard (or specialized) liquid fuel retailers. Apart from benefiting from lower operating costs than standard liquid fuel retailers, hypermarket pump prices tend also to be lower than those of standard branded operators in the fuel sector since: *(i)* their fuels have no brand and *(ii)* they use their fuel prices used as an instrument to attract consumers to their core business of general food retail shops.

1478. Excluding hypermarket pumps, results reveal that inter-brand price differentials, with respect to Galp, can go up to 1.5 to 2 cts/lt, with the exception of a single oil company whose IO95 gasoline average pump price can be 4.12 cts/lt below Galp's average pump prices.[176]

Table 65, Panel B: Discriminated by brands[177]

IO95 Gasoline		Mean	Dispersion	Min	**2,5%**	Median	**97,5%**	Max
Oil companies (major brands)	Brand 1	0.38	0.71	-0.87	**-0.87**	0.44	**1.78**	1.81
	Brand 2	-1.92	1.31	-4.12	**-4.12**	-1.55	**-0.89**	-0.62
	Brand 3	0.11	0.58	-1.11	**-1.11**	0.09	**0.80**	2.14
	Brand 4	-0.16	0.82	-1.92	**-1.92**	-0.10	**1.03**	1.57
	Brand 5	-0.47	0.51	-2.07	**-2.07**	-0.35	**0.04**	0.10
Minor brands	Brand 1	0.11	0.31	-0.23	**-0.23**	0.19	**0.19**	0.37
	Brand 2	0.13	0.63	-1.18	**-1.18**	0.12	**1.10**	1.40
	Brand 3	-0.10	0.48	-0.44	**-0.44**	-0.10	**-0.44**	0.24
	Brand 4	-0.06	0.65	-1.12	**-1.12**	-0.10	**1.01**	1.38
White pumps	Brand 1	-4.40	1.14	-6.01	**-6.01**	-4.39	**-3.60**	-2.28
	Brand 2	-4.14	1.00	-6.70	**-6.70**	-3.93	**-2.85**	-2.48
	Brand 3	-4.80	1.44	-6.37	**-6.37**	-4.49	**-4.49**	-3.53

Diesel		média	dispersão	min	**2,5%**	mediana	**97,5%**	max
Oil companies (major brands)	Brand 1	0.15	0.96	-1.39	**-1.39**	0.03	**1.44**	3.38
	Brand 2	-1.22	0.54	-1.95	**-1.95**	-1.10	**-0.77**	-0.68
	Brand 3	0.16	0.61	-1.26	**-1.26**	0.16	**0.95**	1.99
	Brand 4	-0.34	0.86	-2.89	**-2.89**	-0.14	**0.59**	1.45
	Brand 5	-0.24	0.52	-1.37	**-1.37**	-0.18	**0.47**	0.67
Minor brands	Brand 1	0.18	0.56	-0.33	**-0.33**	0.09	**0.09**	0.77
	Brand 2	0.05	0.62	-1.26	**-1.26**	0.15	**0.63**	1.55
	Brand 3	0.00	0.08	-0.05	**-0.05**	0.00	**-0.05**	0.06
	Brand 4	-0.09	0.71	-1.51	**-1.51**	-0.20	**0.81**	1.75
White pumps	Brand 1	-4.46	1.08	-5.91	**-5.91**	-4.29	**-3.82**	-2.57
	Brand 2	-4.93	1.67	-8.44	**-8.44**	-4.65	**-2.93**	-2.89
	Brand 3	-4.47	2.06	-6.82	**-6.82**	-3.63	**-3.63**	-2.97

[176] It is worth noting that the herein presented inter-brand price differentials result from a disaggregated (econometric) analysis at the level of each local (municipality) market. These inter-brand price differentials must not, therefore, be confounded with inter-brand recommended (or average) price differentials, which tend to be much lower than the results in this Chapter (see, *v.g.*, June 2008 Report, Section 4.3.1. and Charts 7 and 8, as well as Section 9.5.1 above).

[177] For potential confidentiality reasons, the order of brands in this panel is not the same as the one reported in Section 11.1 above.

1479. These inter-brand price differentials represent between 25% and 65% of the estimated national gross retail margin, which varies, according to recent information, between 3 and 6 cts/lt.

1480. Hence, although inter-brand price differentials between 1.5 and 2 cts/lt can be considered small in the eyes of consumers, since these differentials represent a high percentage of the estimated national gross retail margin (between 25% and 65%), it can be economically argued that there is evidence of inter-brand pump price differentiation at the local market level.

12. Econometric analysis of the relation between the price for crude and retail prices for diesel and IO95 gasoline

12.1. Introduction

1481. During the second semester of 2008, there was a significant fall in international reference prices for crude, namely in the (one-month future) prices for Brent in London and for (Sweet) Light Crude contracts (WTI) in the NYMEX. On July 2, the price for Brent reached its historical highest of US$146.10/bbl (US dollars per barrel), corresponding to €91.50/bbl (at the closing exchange rate of that day) or to €56.6 cts/lt. By the end of 2008 (December 26), that price had come down to US$30.36/bbl, corresponding to €26.14/bbl or €16.5 cts/lt.

1482. In analogy with the analysis carried out in the December 2008 Interim Report (in its section 3), the aim of this Chapter is to check whether average pump (or retail) prices before tax (APPBT)[178] for diesel and IO95 gasoline, not only in the case of Portugal (as in that Interim Report) but also across the EU15, reacted with the same speed and amplitude to falls of international reference prices for crude (Brent in the European case) and for refined products (Platts) as they did when those reference prices were going up, and for the integrity of the 2004-2008 period.

1483. Since the contribution of Bacon (1991)[179] on the UK retail sales of gasoline, the economic literature has put forward different explanations for the existence of what Bacon called the "Rockets & Feathers" (or the asymmetry) phenomenon in the adjustment process of prices to cost changes, *i.e.* the fact that prices tend to rise faster and with a greater amplitude (like rockets) when costs go up and take longer to fall and at a lower rate (like feathers) when costs go down (*v.g.*, Borenstein *et al.*, 1997, Peltzman, 2000, Galeotti *et al.*, 2001, Eckert, 2002, Wlazlowski, 2003, Geweke, 2004, Lewis, 2005,

[178] APPBT refer, as afore defined, to the average (effective) pump prices before tax, for diesel and IO95 gasoline, as made available by the EC DG TREN (Directorate General for Energy and Transport) at: http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm. They are defined, for each Member State, as the average of effective pump prices – collected once a week (every Thursday in Portugal up to the end of 2008 and every Monday since the beginning of 2009) – with the price charged in each pump being weighted by its total annual volume of sales per fuel.

[179] Bacon, R. W. (1991). "Rockets and Feathers: The Asymmetric Speed of Adjustment of U. K. Retail Gasoline Prices to Cost Changes", *Energy Economics*, 13: 211-218.

Abranches-Metz *et al.*, 2006, Deltas, 2007, Cabral & Fishman, 2008, Tapata, 2008, and Yang & Ye, 2008)[180]. In particular, Peltzman (2000)[181] empirical findings suggest that this asymmetry phenomenon is not specific to the oil sector, but characterizes as well other sectors, being present in more than two out of three markets over a sample of 77 consumer goods and 165 producer goods. Yang & Ye (2008) argue as well that this phenomenon is present in different sectors, concentrated or not, such as in fresh products (fruits, vegetables, and meat) and the banking sector.

1484. In the December 2008 Interim Report (in its section 3.3), we assessed, in a preliminary way, whether this phenomenon characterizes the national retail sector of liquid motor fuels (diesel and IO95 gasoline). For this, we followed the Borenstein *et al.* (1997) methodology and, accordingly, disentangled between the two major channels on the pass-through of shocks on crude prices to national APPBT, namely

(i) From the (one-month future) price for Brent to national ex-refinery prices (for diesel and IO95 gasoline); and

(ii) From national ex-refinery prices to APPBT for each fuel,

on the basis of weekly data, from the first week of 2004 to the last week of October 2008.

1485. Results from this preliminary assessment revealed, notably, that:[182]

[180] Borenstein, S., Cameron, C. A. e R. Gilbert (1997) "Do Gasoline Prices Respond Asymmetrically to Crude Oil Price Changes?", *Quarterly Journal of Economics*, 112(1): 305-339; Peltzman, S. (2000) "Prices rise faster than they fall", *Journal of Political Economy*, 108: 466-502; Galeotti, M., Lanza, A. e M. Manera (2001) "Rockets and Feathers Revisited: An International Comparison on European Gasoline Markets", *Discussion Paper*, CRENOS, Itália; Eckert, A. (2002) "Retail Price Cycles and Response Asymmetry", *Canadian Journal of Economics*, 35(1): 52-77; Wlazlowski, S. (2003) "Gasoline and Crude Oil Prices: Asymmetric Price Transmission", *Ekonomica – Cyprus Journal of Economics*, 11**:** 1-25; Geweke, J. (2004) *Issues in the "Rockets and Feathers" Gasoline Price Literature*, Report to Federal Trade Commission, University of Iowa, 16 March 2004; Lewis, M. (2005) "Asymmetric Price Adjustment and Consumer Search: An Examination of the Retail Gasoline Market", *Working Paper*, Ohio State University, EUA; Abranches-Metz, R. M., Froeb, L. M., Geweke, J. F. e C. T. Taylor (2006) "A Variance Screen for Collusion", *International Journal of Industrial Organization*, 24: 467-486; Delta, G. (2007) "Asymmetries in Retail Gasoline Price Dynamics and Local Market Power", *Working Paper*, *University of Illinois*, April 2007; Cabral, L. & A. Fishman (2008) "Business as Usual: A Consumer Search Theory of Sticky Prices and Asymmetric Price Adjustment", *Working Paper*, Agosto 2008; Tappata, M. (2008) "Rockets & Feathers: Understanding Asymmetric Pricing", *Working Paper*, *University of British Columbia*, Canada, May 2008; Yang, H. & L. Ye (2008) "Search with Learning: Understanding Asymmetric Price Adjustments", *RAND Journal of Economics*, 39(2): 547-564. The factors suggested by this literature as possible explanations of this asymmetry phenomenon in the oil sector are detailed in the December 2008 Interim Report (Section 3.1).

[181] See, in particular, the Geweke (2004) and Yang & Ye (2008) comments on Peltzman (2000).

[182] *Cf.* December 2008 Interim Report, Section 3.3.

(i) A rise / fall of 1 (€) cts/lt[183] (*i.e.*, of € 0.01 cts/lt) in the average national ex-refinery price is fully passed-through with the same amplitude (of 1 cts/lt) to APPBT for diesel and IO95 gasoline, 3 to 4 weeks after the initial shock;

(ii) Most of the asymmetries come from the international channel "Brent → ex-refinery", both in the delay and the amplitude of adjustment of ex-refinery prices (as indexed to its reference Platts CIF NWE prices) to a 1 cts/lt rise and fall of the price for Brent.

1486. This preliminary analysis was not based on effective average national ex-refinery prices, but rather on the Galp's ex-refinery indexation formula to the reference Platts CIF NWE prices, what we called "proxies to national ex-refinery prices".[184]

1487. Yet, since ex-refinery prices all over Europe follow Platts CIF prices – NWE for North Western (or Atlantic) Europe, as referenced in the ARA (Amsterdam / Rotterdam / Antwerp) zone, and MED for the Mediterranean area, as referenced in the seaports of Lavera (France) and Genova (Italy) –, it cannot be *a priori* dismissed the possibility that APPBT react to Platts CIF price variations before these are passed-through to ex-refinery prices, in a reaction to expected future changes of ex-refinery prices (see, *v.g.*, Borenstein & Shepard, 1996)[185].

1488. Moreover, considering Platts CIF (NWE and MED) prices, rather than national ex-refinery, allows for a comparative analysis of the asymmetry phenomenon across all the Member States (henceforth "MS") of the EU15.

1489. The assessment of the asymmetry phenomenon becomes particularly interesting in the last quarter of 2008 – not covered by the December 2008 Interim Report – given the strong fall, over that period, in the international reference prices for both crude (Brent) and refined products (Platts), notwithstanding their slight recover in 2009 (see also section 12.2 below).

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183 We shall in this Chapter refer to "cts/lt" as expressed in euros (€).

184 This proxy to national ex-refinery prices (for diesel and IO95 gasoline) corresponds, in week *t* and since the first week of 2008, to the average of the daily Platts CIF NWE prices over week *t*-1, being such an average expressed in US$ and converted into € by the means of the ECB weekly average exchange rate, at week *t*-1. Until the end of 2007, those daily CIF NWE prices were averaged over the two weeks, *t*-1 and *t*-2, prior to the setting of ex-refinery prices, and converted into € by the means of the ECB average exchange rate over week *t*-1 (*cf.* December 2008 Interim Report, Section 3.2, footnote No. 43, p. 59).

185 Borenstein & Shepard (1996), "Dynamic Pricing in Retail Gasoline Markets", *RAND Journal of Economics*, 27(3): 429-451, find evidence that US retail prices for gasoline react to expected future changes of both ex-terminal prices (the equivalent to ex-refinery prices in Europe) and crude prices.

1490. The aim of the present Chapter 12 is, therefore, to present an in-depth analysis of the asymmetry phenomenon going beyond the one carried out in the Interim Report (in its section 3.3), covering all MS of the EU15 and the entire five years period 2004-2008. Considering the EU15 rather than the entire EU (EU27) is justified by the availability of APPBT information and by the strong heterogeneity of retail price regimes in the EU27 relative to the EU15. Notwithstanding, it must be noted that, up to the end of 2008, Irish retail pump prices were still subjected to a regime of administrative control, in contrast with the situation in the remaining EU15 MS.

1491. In analogy with the Interim Report (section 3.3), we follow the Borenstein *et al.* (1997) econometric methodology – based on a co-integration type of modelling but allowing for asymmetries in the short to medium run adjustment process – and consider, accordingly, the distinction between the two major channels of pass-through from shocks on the price for Brent to APPBT, namely the international channel "Brent → Platts CIF (NWE or MED)" and the domestic channels "Platts CIF (NWE or MED) → APPBT".

1492. In addition to the analysis in the Interim Report, we further assess the statistical significance of the asymmetry phenomenon[186] as well as the possible endogeneity in the relations between the price for Brent and the Platts (NWE and MED) prices for both fuels, and between these and the 1-month NYMEX futures price for gasoline.

1493. The remaining of this Chapter is structured as follows: we start by describing the proposed modelling of the asymmetry phenomenon, including the data description, a comment on the Platts international dimension and the above referred endogeneity test results (section 12.2). We then present and comment on the asymmetry phenomenon empirical findings over the considered channels (section 12.3). We conclude the Chapter by some final comments on the major results (section 12.4).

12.2. Asymmetry phenomenon in the EU15

1494. As referred above, we follow the Borenstein *et al.* (1997) approach to model the asymmetry phenomenon across all EU15 MS and consider, accordingly,

[186] This includes the estimation of the 95% confidence intervals of the impulse response functions related with each channel, "Brent → CIF (NWE and MED)", "CIF → APPBT" and "Brent → APPBT".

the distinction between the two major channels of retail price formation in the EU15, namely:

(i) The international channel "Brent → Platts CIF (NWE and MED)" on the way (positive and negative) changes on the price for Brent (1-month futures) are passed-through to the (spot)[187] European Platts CIF (NWE and MED) prices for diesel and IO95 gasoline; and

(ii) The domestic channels "Platts CIF (NWE or MED) → APPBT" on the way rises and falls of the reference ex-refinery prices for Europe (Platts CIF) are passed-through to final APPBT for diesel and IO95 gasoline across each one of the EU15 MS, including the EU15 average.

From the integration of these two channels, one obtains the integrated domestic channels "Brent → APPBT" which describe the way APPBT, for diesel and IO95 gasoline across the EU15 MS, adjust to rises and falls in the price for raw material (Brent), taking into account both the relation of these APPBT with Platts CIF prices and the way the latter relate with the price for Brent.

1495. While Borenstein *et al.* (1997) find evidence for the existence of endogeneity in the relation between ex-terminal prices across US cities – similar to ex-refinery prices in Europe – and the reference crude prices in the US,[188] since Brent and Platts CIF (NWE and MED) serve as reference for European crude and ex-refinery prices respectively, we cannot *a priori* dismiss a possible endogenous relation between Brent and European Platts prices, *i.e.* the possibility of a bi-directional causality relation between Brent and Platts prices.

1496. Hence, preliminary to the econometric analysis of the asymmetry phenomenon (subsection 12.2.3), we assess the possible endogeneity in the relations between Brent and European Platts prices for both fuels (diesel and IO95 gasoline) as well as in the relation between Platts FOB (NEW and MED) prices for gasoline and the one month futures price for this product in the NYMEX (subsection 12.2.2). We first describe the data used in the analysis and comment on the worldwide importance of Platts (subsection 12.2.1)

[187] To be noted that, according to Platts, its prices (NWE and MED), in CIF or FOB, are not exactly spot, but correspond rather to average prices over a delivery period between 10 and 25 days.

[188] See as well Geweke (2004) comments on this type of endogeneity.

12.2.1. Data and some reflexions on Platts prices

1497. The above referred possible endogenous relation between Platts and Brent prices may actually have a geographic dimension beyond the European (or the EU). Previous analysis suggests, in fact, a striking closeness between the levels of the Platts FOB NWE price for gasoline and the one month futures NYMEX price for the same product (see also Chart 99 below).[189] According to that analysis, the closeness between these two series could explain the seasonal peaks in the European Platts prices for gasoline, as well as on the respective APPBT, which also characterize the 1-month futures price for that product in the NYMEX, but do not appear on both the prices for Brent and the European Platts and APPBT for diesel (see also Chart 100 and Chart 101 below).

1498. Apart from economic reasons related to the international trade of liquid fuels or the greater weight gasoline has in total fuel consumption in the US than in Europe when compared with diesel,[190] this parallel evolution between European Platts and the NYMEX 1-month futures prices for gasoline may, actually, also stem from the Platts' international dimension, *i.e.* from the importance Platts prices for different commodities have worldwide.

1499. According to Platts[191], this agency was created by Warren Platt, in the 1910 decade and has experienced a strong development since the start of the publication of the "Platts Oilgram Price Service" in 1923, with daily information on reference prices for crude and refined products. Later on, in 1953, Platts was acquired by the Mc-Graw Hill Companies, created at the end of the XIX century. Since 2004, Platts has been one of the leading worldwide publication platforms for prices and other indicators on several commodities.[192] Platts prices are used as reference in several worldwide

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189 *Cf.* June 2008 Report, Section 4.2, paragraphs 75 and 76, and Chart 43. On average over the herein considered period (2004-2008), the differentials between these two series as well as between the Platts FOB MED price for gasoline and the NYMEX's are below 2.5 (€) cts/lt (see Table 86 in Appendix 3).

190 In particular, on average over the 2002-2007 period, diesel accounts for 69,8% of the total European consumption of that fuel together with IO95 gasoline (see also Table 85 in Appendix 2). Although these percentages exclude other types of gasoline (*v.g.*, new generation and IO98), it also excludes other types of diesel, potentially more important than the latter types of gasoline, such as the new generation, the coloured (mostly, for agricultural uses), and the heating types.

191 *Cf.* http:// www.*Platts*.com/About%20*Platts*/history.html, http://www.*Platts*.com/Oil/Market%20Prices/, http://www.*Platts*.com/Oil/Newsletters%20&%20Reports/US%20Marketscan/ e http:// www.*Platts*.com/ Contact%20Us/. See also Section 6.3.1.1 above.

192 These commodities include crude and the related refined products, electricity, natural gas, coal, nuclear power, petrochemicals, and metals, as well as risk management-based financial products (*cf.* http://www.*Platts*.com).

markets. In particular and at least since 1928, Platts prices for diesel and gasoline serve as reference for several US refineries located in the Atlantic, Gulf of Mexico, and West coasts as well as in the Chicago area.

1500. Hence, both the Platts international dimension and the existence of two major groups of international markets, for crude and for refined products, such as motor diesel and gasoline, suggest an endogenous relation between reference prices for crude (Brent in London and WTI in the NYMEX) and reference prices for refined products (European and US Platts together with the NYMEX 1-month futures for gasoline).

1501. In order to assess this endogeneity issue and the asymmetry phenomenon, we consider weekly data[193] over the period 2004-2008 on:[194]

(i) The weekly average, from Monday to Friday, of the daily prices for 1-month Brent and WTI futures (Reuters' daily closing), quoted in US$ and converted into € (cts/lt) by the means of the weekly average exchange rate US$/€, relating to the same week, as published by the European Central Bank (ECB);

(ii) The weekly average, from Monday to Friday, of the Platts (NWE and MED[195]), in CIF and FOB, prices for motor diesel and (unleaded premium) gasoline, as published by Platts, quoted in US$ and converted into € (cts/lt) by the means of that ECB weekly average exchange rate US$/€;

(iii) The weekly average, from Monday to Friday, of the price for 1-month futures of (unleaded premium) gasoline in the NYMEX (Reuters' daily closing), quoted in US$ and converted into € (cts/lt) by the means of that ECB weekly average exchange rate US$/€;[196] and

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[193] Although daily data, available for international prices for crude (Brent and WTI) and for refined products (Platts and NYMEX), might provide a more rigorous analysis of the herein considered issues, there is no information in such a frequency for APPBT in Europe. Moreover, a daily data analysis may require additional controls for potential volatility dynamics – which have been not found in the residuals of our regressions based on weekly data – as well as a reformulation of the co-integration type of models considered. We shall thus leave this for further research.

[194] Although these series are available for January and February 2009, we opted from leaving them out of the analysis as they represent a new upward cycle (even if weak) on international prices for oil and refined products. Moreover, the European Platt's specifications of diesel and gasoline have also changed since the beginning of 2009, from 50ppm to 10ppm (see also Appendix 2, footnote No. 241).

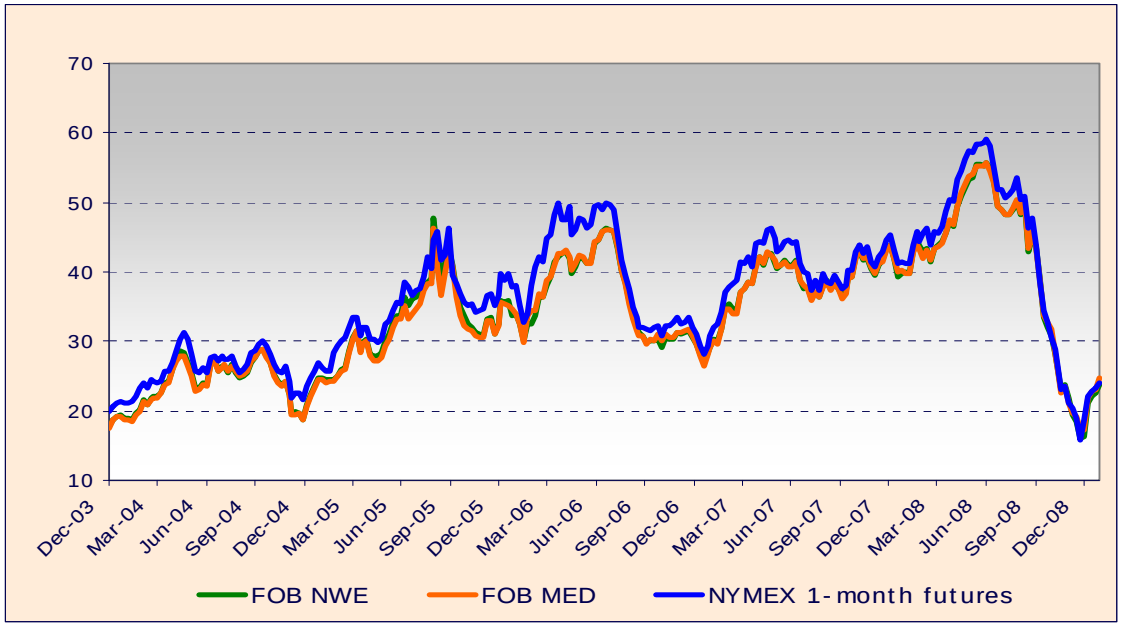
[195] Because the Platts MED prices are not available for the first fall of 2004, these values have been extrapolated from the ratio between the respective average Platts NWE and MED prices observed during the first fall of 2005.

[196] Oil prices, *Brent* and WTI, are published in US$/bbl and converted into cts/lt by the means of the approximation 1 bbl = 158.9873 lt. Platts prices are published in US$/tone and converted into cts/lt by the means of the approximations 1 tone = 755 and 845 lt of gasoline and diesel respectively. The price for 1-month futures of (unleaded premium) gasoline in the NYMEX is published in US$/US gallon and is converted into cts/lt using the approximation 1 US gallon = 3.5874 lt (from the

(iv) The weekly APPBT for diesel and IO95 gasoline, in € cts/lt, for each one of the EU15 MS, including the EU15 average, as published by the EC DG TREN (*cit.*).

1502. We show below the afore referred parallelism between the Platts FOB (NWE and MED) and the 1-month futures NYMEX prices for (unleaded premium) gasoline (Chart) together with the relation between the price for Brent (1-month futures) and the Platts CIF NWE as well as the APPBT for diesel and IO95 gasoline in Portugal, Spain, and on average across the EU15 (Chart 100 and Chart 101 respectively).

Chart 99 - Weekly averages of Platts FOB, NWE and MED, and of the 1-month NYMEX futures prices for (unleaded premium) Gasoline (€ cts/lt)



equality, 1 bbl = 42 US gallons). Missing daily observations have been replaced by simple extrapolation between the immediately before and after observed values.

Chart 100 - Weekly averages of APPBT for Diesel in Portugal, Spain, and the EU15 average in comparison with the respective Platts CIF NWE price and the price for 1-month Brent futures (€ cts/lt)

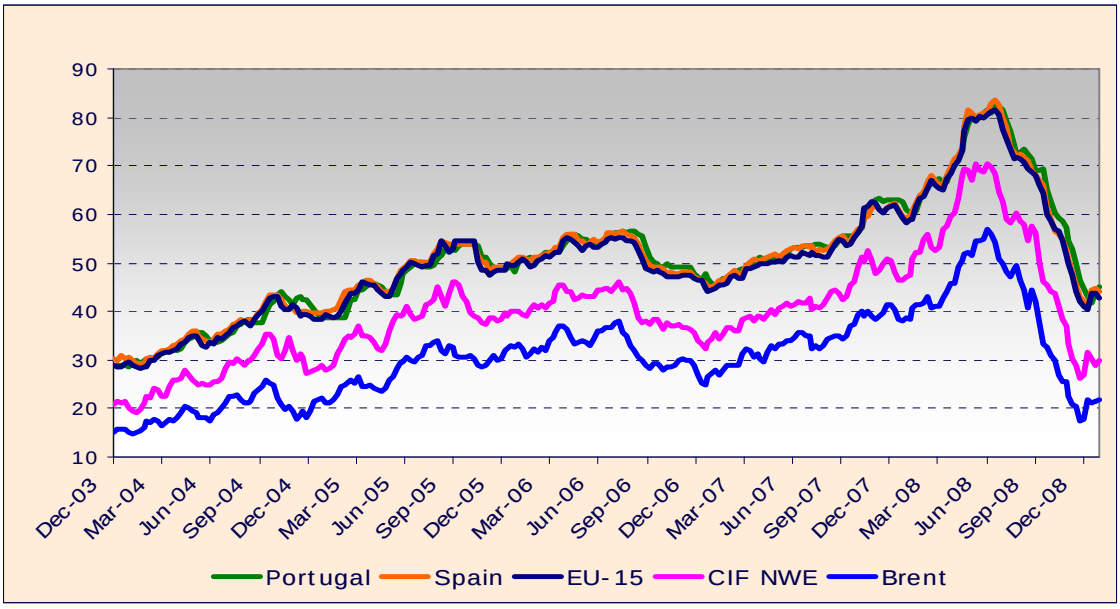
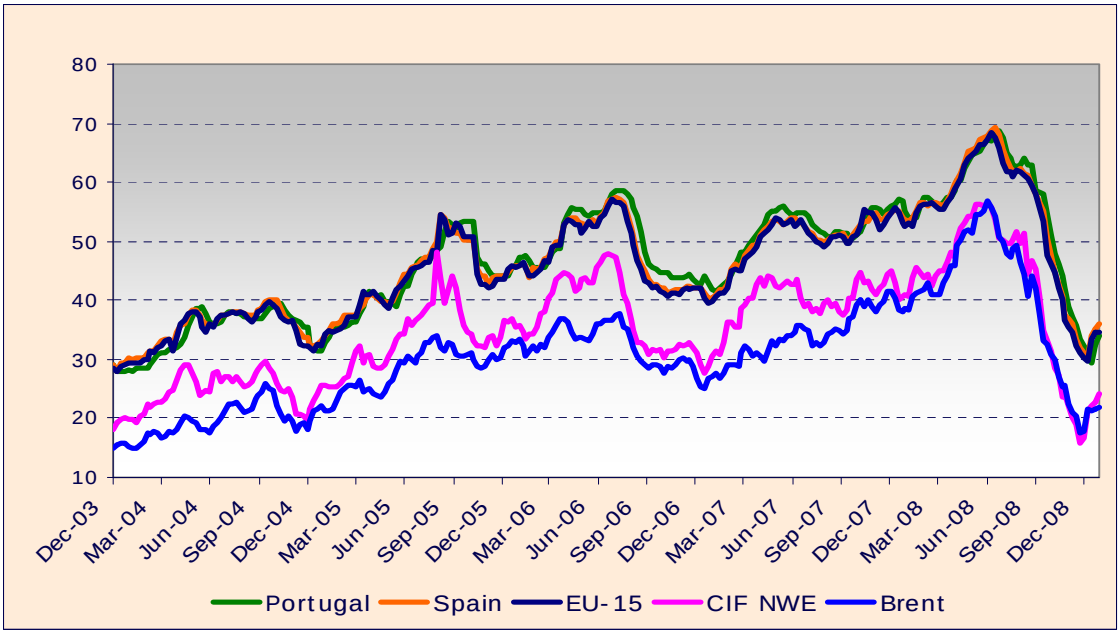


Chart 101 - Weekly averages of APPBT for IO95 Gasoline in Portugal, Spain, and the EU15 average in comparison with the respective Platts CIF NWE price and the price for 1-month Brent futures (€ cts/lt)



1503. It is worth noting that not only is the 1-month NYMEX futures price for gasoline close in level to the Platts FOB (NWE and MED) prices for that

product, with differentials below 2.5 cts/lt, on average over the period 2004-2008, but there is also almost no difference between the CIF and FOB Platts NWE and MED prices per fuel. The differential between these Platts NWE and MED prices for diesel and gasoline are, respectively and on average over that period, -0.40 and 0.14 cts/lt in FOB and -0.31 and 0.45 cts/lt in CIF. Over the same period, the differentials between Platts CIF and Platts FOB (NWE and MED) prices are, on average, below 1.05 cts/lt (see Table 86 in Appendix 3).

1504. We test below for the possible endogeneity in the relation between Brent and European Platts prices (see subsection 12.2.2 below).

12.2.2. Endogeneity in the relation between European reference prices for crude (Brent) and refined products (Platts)

1505. Notwithstanding the afore referred, the application of Granger causality tests[197] reveal, at very high probability levels (above 99%), the inexistence of endogeneity in the herein studied relations.

1506. First, results reveal the inexistence of causality from, on the one hand, Platts CIF (NWE and MED) prices for both diesel and gasoline to the price for Brent (1-month futures), with the causality being only on the (desired) "Brent → Platts" direction and, on the other hand, from the Platts FOB (NWE and MED) prices for gasoline on the 1-month futures price for the same product in the NYMEX, with the causality being only on the "NYMEX → Platts" direction.[198]

1507. Given the Platts international dimension together with its importance in the US market, it cannot be excluded that this one-way causality "NYMEX → Platts" may result from the longer maturity of the NYMEX 1-month futures contracts as opposed to the average 10 to 25 days maturity of European Platts contracts.[199]

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[197] The Granger causality test together with its results are described in detail in Appendix 3, Section A3.3.

[198] This causality "NYMEX → Platts" of gasoline, and not on the other way around, is actually consistent with previous (preliminary) arguments in the June 2008 Report (Section 4.2, *cit*.).

[199] It is further interesting to note that European Platts prices are published before the NYMEX's, at 16:30 GMT.

1508. Analogously, results further reveal an endogenous relation (or a two-sided causality) between international oil prices (Brent and WTI) and between these and the 1-month NYMEX futures for gasoline.

1509. These results remain unaltered when we consider the original daily series, expressed both in US$ and in €.

1510. On the asymmetry phenomenon, these results imply that, in spite of the Platts international dimension and in contrast with the Borenstein *et al.* (1997) findings for the US market, the international channel "Brent → Platts" can be tackled with no need for an additional control on the possible causality the other way around, on the "Platts → Brent" direction. The same is valid for the analysis of the channel "NYMEX → Platts for gasoline" (see subsection 12.2.3 below).

12.2.3. Econometric modelling of asymmetries in the EU15

1511. Let b_t denote week t's average price for Brent, c_t be the weekly average Platts CIF, NWE or MED depending on the considered country (see below), for either diesel or gasoline, and p_{it} be the weekly APPBT, for either diesel or gasoline, in country i including the EU15 average (all in cts/lt).

1512. In analogy with the Borenstein *et al.* (1997) econometric model, but with no need to adjust for the inexistent causality "Platts → Brent", the considered models on the asymmetry phenomena over the two channels "Brent → Platts" and "Platts → APPBT" are, for each fuel (diesel and IO95 gasoline) and per MS, plus the EU15 average, described by the following equations (12.1) and (12.2) respectively:[200]

$$\Delta c_t = \delta_0 + \sum_{j=1}^{5}\left(\delta_j^{+}\Delta c_{t-j}^{+} + \delta_j^{-}\Delta c_{t-j}^{-}\right) + \sum_{j=0}^{5}\left(\gamma_j^{+}\Delta b_{t-j}^{+} + \gamma_j^{-}\Delta b_{t-j}^{-}\right) + \\ + \psi(c_{t-1} - \rho_0 - \rho_1 b_{t-1}) + \zeta_t, \qquad (12.1)$$

[200] Model (12.1) is also considered for the analysis of the international channel "NYMEX → Platts FOB (NWE and MED) for gasoline" (Section 12.3.1 below). It is further worth noting that the fact of considering coefficients up to 5 lags and not 4 as in the Interim Report (Section 3.3) is due to the facts of the present analysis being based on Platts CIF prices rather than ex-refinery as in that Report as well as on all EU15 MS and not only the national case.

$$\Delta p_{it} = \alpha_0 + \sum_{j=1}^{5}\left(\alpha_j{}^{+}\Delta p_{it-j}{}^{+} + \alpha_j{}^{-}\Delta p_{it-j}{}^{-}\right) + \sum_{j=0}^{5}\left(\beta_j{}^{+}\Delta c_{t-j}{}^{+} + \beta_j{}^{-}\Delta c_{t-j}{}^{-}\right) + \\ + \lambda(p_{it-1} - \phi_0 - \phi_1 c_{t-1}) + \xi_{it}, \quad (12.2)$$

where the subscripts "+" and "-" denote, respectively, positive and negative variations of the corresponding variables, being defined for any time series x_t in the following way:

$$\Delta x_t{}^{+} = \Delta x_t I(\Delta x_t > 0), \\ \Delta x_t{}^{-} = \Delta x_t I(\Delta xt \le 0), \quad (12.3)$$

with *I(.)* being a dummy variable taking the value 1 if the inner expression is true and 0 otherwise.

1513. The subscripts "+" and "-" define a specific coefficient on the variables they are associated with, describing thus the respective possible asymmetries to positive and negative shocks, α_0 and δ_0 are constant terms, the associated expressions to the other α e δ represent the auto-regressive components specific to Δc_t and Δp_{it} respectively, the terms associated with the ψ and λ coefficients represent the respective co-integration relations – which establish a common stochastic trend between the associated variables, forcing, in an error correction way, any shock away from the trend to bring, the two variables back to the trend after a certain adjustment delay –[201], the terms on the γ and β coefficients represent, respectively, the adjustment asymmetries of Platts CIF prices (c_t) to shocks on Brent price (b_t) and of APPBT (p_{it}) to shocks on Platts prices (c_t). Finally, ξ_{it} and ζ_t are white noise processes, with zero mean and time-invariant variance, which are presumed uncorrelated with the RHS variables of the respective equation.

1514. Whilst model (12.2) disentangles between 32 cases, related with the APPBT for diesel and IO95 gasoline per EU15 MS and for the EU15 average, in model (12.1) includes as many cases as distinct Platts CIF prices in the EU15. Although most EU15 MS fit in one of the two Platts zones, NWE or MED – with their reference Platts CIF prices being the respective Platts CIF NWE or MED prices – Spain and France have refining plants located in both Platts NWE and MED zones, thus their reference Platts CIF prices together

[201] See *v.g.*, Hamilton, J. D. (1994), *Time Series Analysis: Theory and Practice*, Princeton University Press, New Jersey, for a detailed description of error correction models.

with the reference Platts CIF prices for the EU15 average must be a weighted average of the two reference Platts CIF NWE and MED prices.

1515. Given the available data, we compute the reference Platts CIF prices (per fuel) for Spain and France in a different way from the reference Platts CIF prices for the EU15 average.

1516. The reference Platts CIF prices for Spain and France are computed as the average between the Platts CIF NWE and MED prices weighted by the respective refining capacity (in thousands of oil barrels per day) each one of these two States have in those Platts zones. The reference EU15 average Platts CIF prices are, in turn, computed as the weighted average of reference Platts CIF prices per MS with weights related with each MS total annual consumption of each fuel (diesel and IO95 gasoline), on average over the period 2002-2007.[202]

1517. The repartition of EU15 MS across the two Platts European reference zones is thus the following:

(i) Platts CIF NWE: Sweden, Finland, UK, Ireland, Denmark, Belgium, Netherlands, Luxembourg, Germany, Portugal, Spain with a 33.9% weight, France with a 66.5% weight, and the EU15 average with weights of 69.4% and 62.9% for gasoline and diesel respectively; and

(ii) Platts CIF MED: Italy, Greece, Austria[203], Spain with a 66.1% weight, France with a 33.5% weight, and the EU15 average with weights of 30.6% and 37.1% for gasoline and diesel respectively.

1518. We present below the empirical findings on the estimation of models (12.1) e (12.2) above (section 12.3).

[202] The way these weights are constructed is detailed in Appendix 2.

[203] According to information from the Austrian Competition Authority (*Bundeswettbewerbs- behörde*), Austrian refineries are linked through pipeline to Italy, thus the location of Austria in the Platts MED zone.

12.3. Empirical findings on the asymmetry phenomenon in the EU15

1519. Similarly to Borenstein *et al.* (1997) and the analysis in the Interim Report (section 3.3), we analyze the asymmetry phenomenon on the basis of the cumulative impulse response function (IRF) estimates related with each channel "Brent → Platts CIF", "Platts CIF → APPBT", and "Brent → APPBT".[204]

1520. Briefly, letting Δy_t be the dependent variable – in case, Δc_t in model (12.1) and Δp_{it} in model (12.2) – and Δx_t be the explicative (or exogenous) variable – in case, Δb_t in model (12.1) and Δc_t in model (12.2) – the IRF of Δy_t relatively to Δx_t corresponds to a sequence $\{B_k$; for all integer $k \geq 0\}$ where B_k reflects the change in y_{t+k} in the cumulative of k weeks after the initial one unit (1 cts/lt) shock on x_t, *i.e.* the cumulative Δy_{t+k} after the initial shock $\Delta x_t = 1$ (cts/lt). In case of the asymmetries allowed for in models (12.1) and (12.2) above, these IRF are further disentangled between IRF to positive shocks ($\Delta x_t = 1$) and IRF to negative shocks ($\Delta x_t = -1$).

1521. Overall, results, as detailed below, reveal, first, that in all channels ("Brent → Platts CIF", "Platts CIF → APPBT", and "Brent → APPBT"), the long run (equilibrium) cumulative impact on the dependent variable (y_t) is (at the standard 95% probability level) identical to the initial shock on the exogenous variable (x_t), being this latter positive ($\Delta x_t = 1$) or negative ($\Delta x_t = -1$). Formally, this means that the adjustment process (or the corresponding IRF) reaches the steady state at a level which cannot be considered statistical different from one (cts/lt), from the initial shock on x_t.

1522. Second, in the international channel "Brent → Platts CIF (NWE e MED)" (subsection 12.3.1 below) there is evidence of asymmetries only in the case of diesel. In the domestic channels "Platts CIF → APPBT", asymmetries exist in some MS and for both fuels (subsection 12.3.2). In the integrated domestic channels "Brent → APPBT", asymmetries get amplified in the case of diesel and attenuated in the case of gasoline (subsection 12.3.3).

1523. Letting $\{B_k^+\}$ e $\{B_k^-\}$ be the IRF to positive and negative shocks respectively, on the analysis of the respective 95% confidence intervals estimates, one must, notably, consider:

[204] Appendix 3 describes the way these IRF are determined as well as the way the respective 95% confidence intervals are estimated in order to assess their statistical significance.

(i) The adjustment delay, *i.e.* the number k of weeks after which each B_k^+ and B_k^- cannot be considered statistically different from 1 (*i.e.*, from the steady state value), which signals the time delay at which the respective IRF (to rises or falls) reaches the steady state, where the cumulative variation of the dependent variable (y_t) is identical to the initial shock on the exogenous variable (x_t). There is statistical evidence of asymmetry in the adjustment delay in case $\{B_k^+\}$ reaches the steady state before $\{B_k^-\}$; and

(ii) The adjustment amplitude (or the rate of convergence to the steady state), where, regardless of the existence or not of asymmetries in the adjustment delay, there is statistical evidence of asymmetry in the amplitude of adjustment in case, for the same lag k, the estimated value of B_k^+ is statistically higher than the estimated value of B_k^-, which happens when the estimated values of B_k^+ and B_k^- are, respectively, above and below the upper and lower limits of the respective 95% confidence intervals.

12.3.1. Asymmetries in the international channels

1524. Regarding gasoline, results reveal no asymmetries in both international channels "Brent → Platts CIF (NWE and MED)" and "NYMEX → Platts FOB".[205]

1525. First, in response to a 1 cts/lt rise or fall of the price for Brent, the Platts CIF prices for gasoline reach, in zone MED price, immediately the steady state, at the time of the shock (at k = 0)[206] whereas in zone NWE, the steady state is reached immediately (at k = 0) in case of a fall in the price for Brent but only after a week (at k = 1) in case this latter price rises.[207] The asymmetry phenomenon, as known in the economic literature, assumes the opposite.[208]

1526. In the channel "NYMEX → Platts FOB (NWE and MED) for gasoline", there is no evidence of asymmetries both in the adjustment delay and amplitude, with the steady state being reached, respectively, 1 and 2 weeks after an initial fall and rise in the 1-month futures NYMEX price for gasoline.

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[205] These results are detailed in Appendix 3, Section A3.4.1.

[206] Formally, as illustrated in Appendix 3 (Section A3.4.1), this means that the IRF $\{B_k^+\}$ and $\{B_k^-\}$ of the channel, "Brent → Platts CIF MED for gasoline", cannot, for any $k \geq 0$, be simultaneously considered as statistically different from each other and from 1, as the estimates of each B_k^+ and B_k^- fall within the 95% confidence interval of each other and these intervals include the value of 1.

[207] Statistically speaking, this means that the ordinate B_0^- of the respective IRF to negative shocks is statistically below 1 and different from B_0^+, which cannot be statistically considered as different from 1.

[208] We shall here and henceforth refer to the asymmetry phenomenon in the way it is described in the economic literature (also known as "Rockets & Feathers") not in the other way around, *i.e.* not if prices increase at a slower and lower rate when costs rise than they do when costs fall.

1527. Asymmetries at the international level are only present in the channels "Brent → Platts CIF (NWE and MED) for diesel", both in the amplitude and delay of adjustment. Whilst a 1 cts/lt rise in the price for Brent is fully passed-through at the time of the impact (at k = 0) to the Platts CIF (NWE and MED) prices for diesel – which tend though to increase a little more than the rise in the price for Brent at that delay k = 0 –, a fall in the price for Brent takes up to 2 weeks to be fully passed-through to those prices.

1528. More than asymmetries in the adjustment delay, these channels are, notably, characterized by strong asymmetries in the amplitude of adjustment. Whilst Platts CIF prices for diesel fully adjust to a fall in the price for Brent in a 2 weeks delay after that fall, a 1 cts/lt rise in this price implies a higher increase (above 1 cts/lt) of those Platts prices up to 8 and 5 weeks after the initial shock on Brent in the zones NWE and MED respectively, after which the cumulative impact on these Platts prices revert to the initial 1 cts/lt rise in the price for Brent.[209] This phenomenon, usually known as "overshooting", *i.e.* of a more than proportional reaction of Platts prices for diesel following an initial 1 cts/lt rise in the price for Brent, leads Platts CIF NWE price for diesel to rise up to 1.55 cts/lt (statistically between 1.26 cts/lt and 1.84 cts/lt)[210] during the 4 weeks which follow the initial shock on Brent and Platts CIF MED price for diesel to rise up to 1.56 cts/lt (with minimal and maximal values of 1.29 cts/lt and 1.82 cts/lt respectively) during the 3 weeks which follow the initial shock on Brent.

1529. The much stronger asymmetries verified in the international channel "Brent → Platts CIF" for diesel than for gasoline, notably, those related with the overshooting phenomenon, can be due to the following factors:[211]

(i) First, whilst the adjustment of Platts CIF prices for diesel to a fall in the price for Brent are similar between the two zones NWE and MED, the overshooting phenomenon is (far) more pronounced in the NWE than in the MED areas, which may be due to the higher importance of zone NWE, when compared

[209] Formally, this means that after 8 and 5 weeks Platts CIF NWE and MED prices, respectively, for diesel adjust to a cumulative increase equal to the initial rise (of 1 cts/lt) in the price for Brent (see Appendix 3, Section A3.4.1 for details).

[210] These minimal and maximal values correspond to the lower and the upper limits of the 95% confidence interval of the corresponding IRF ordinate respectively (see Appendix 3 for details).

[211] Notwithstanding, as above referred, an analysis with daily data (left for further research) might result in a shorter duration of the overshooting phenomenon (below 5 to 8 weeks).

with zone MED, in total fuel (mostly diesel) consumption in Europe.[212] These facts coupled with the European deficit in diesel production put additional pressure in the reference (Platts CIF) price for diesel in case the price for raw material (Brent) increases.

(ii) Analogously, issues related with diesel stocks management and/or reposition – given the high importance of this product in European total fuel consumption coupled with its European production deficit – may lead European refining plants to fear future rises in the price for Brent following its initial rise, which puts additional pressure on the European reference ex-refinery (Platts CIF) price for that product;

(iii) Regarding gasoline, the fact that this product is less important than diesel for European fuel consumption puts less pressure over its reference ex-refinery price (Platts CIF) in response to a change in the price for Brent. Moreover, since gasoline is an important product for European trade balance, notably, with respect to the US – with Europe being a net exporter of this product, in particular, to the US – creates an incentive on European gasoline price competitiveness, which may justify the high speed and symmetry in the way European reference ex-refinery (Platts CIF) prices for gasoline react to a change (rise or fall) on the prices for both crude (Brent and WTI) and the 1-month futures for gasoline in the NYMEX.

12.3.2. Asymmetries in the domestic channels "Platts → APPBT"

1530. In the analysis of this channel as well as of the integrated channel "Brent → APPBT" (subsection 12.3.3 below), we exclude the case of Ireland since retail prices were in this State up to the end of 2008, in opposition with the situation in the remaining EU15 MS, subjected to administrative control. Perhaps for this reason, Irish APPBT are characterized by the slowest adjustment process, to both Platts and Brent prices, being further subjected to rather counter-intuitive short run variations.[213]

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[212] As above referred, diesel represents, on average over the period 2002-2007, more than the double of the European total consumption of gasoline (in particular, standard diesel accounts for 69.8% of the total European consumption of this fuel together with IO95 gasoline). In the same period, the NWE zone accounts for 69.4% and 62.9% of total European consumption of IO95 gasoline and (standard) diesel respectively. Although the relative importance of diesel in the total European consumption of this fuel together with IO95 gasoline is higher in the MED zone (73.8%) than in the NWE (67,7%), the total annual consumption of these fuels in Europe amounted in zones NWE and MED, in millions of m^3 and on average over the 2002-2007 period, to 89.2 and 52.6 in the case of diesel and to 42.5 and 18.7 in the case of IO95 gasoline respectively (see Table 85 in Appendix 2).

[213] See Appendix 3, Sections A3.4.2 and A3.4.3 for details.

1531. Asymmetries characterize some of the domestic channels "Platts CIF → APPBT", namely (see Table 66 below): Greece in gasoline, both in the delay and amplitude of adjustment; Italy in diesel in the delay of adjustment and in gasoline in the amplitude of adjustment; Belgium and Finland in both fuels and in the delay and amplitude of adjustment; Germany in diesel in the amplitude of adjustment and in gasoline in both the amplitude and delay of adjustment; Netherlands in gasoline and only in the delay of adjustment (1 week faster to rise than to fall); and Portugal in both fuels, but only in the delay of adjustment (1 week).

Table 66 – Adjustment delays (in number of weeks) of APPBT in the EU15, for diesel and gasoline, to rises and falls of the respective Platts CIF prices

	Diesel		IO95 Gasoline	
	Rise	**Fall**	**Rise**	**Fall**
Austria	3	2	4	
Greece	3		**2**	**3**
Italy	**4**	**5**	5	
Spain	6	2	5	
France	2		2	
Belgium	**2**	**3**	**2**	**5**
Denmark	1		1	
Finland	**1**	**3**	**1**	**4**
Germany	2		**1**	**2**
Ireland	7	6	**6**	**7**
Luxembourg	1		2	
Netherlands	1		**1**	**2**
Portugal	**4**	**5**	**5**	**6**
Sweden	1		1	
UK	5	4	6	5
EU15 Average	3	2	3	

Legend: Shadow areas indicate the asymmetry cases and in the adjustment delay if numbers are in bold. Columns with the same number indicate the same adjustment delay to rises and falls.

1532. With the exception of the Irish case, 7 MS do not show evidence of asymmetries in their channels "Platts CIF → APPBT" for both fuels, namely: Austria, Spain, France, Denmark, Luxembourg, Sweden, and UK. The absence of asymmetries in this channel is also valid for Greece and the Netherlands in the case of diesel.

1533. The cases of Italy and Germany in gasoline and diesel respectively are also of interest as they reveal asymmetries in the amplitude but not in the delay

of adjustment. Both APPBT, for gasoline in Italy and for diesel in Germany, rise more than they fall (in amplitude) 1 week after the initial impact on the respective Platts CIF prices. The adjustment process of these APPBT is completed 5 and 2 weeks after the initial shock (positive or negative) in the cases of Italy (gasoline) and Germany (diesel) respectively.

1534. On the asymmetries on both the delay and amplitude of adjustment, we note the cases of:

(i) Germany in gasoline, where a rise of the respective Platts CIF price is fully passed-through to the APPBT 1 week after the shock, but takes 2 weeks in case of a fall. The rise 1 week after the shock is further statistically higher than the amplitude of the fall at that time delay;

(ii) Greece in gasoline whose APPBT reacts in the same way to a rise and a fall of the respective Platts CIF price 1 week after the shock, but with larger amplitude to a rise than to a fall 2 weeks after the shock. The adjustment process is completed (*i.e.*, reaches the steady state) 2 and 3 weeks after the initial rise and fall of the corresponding Platts CIF price respectively;

(iii) Belgium and Finland whose asymmetry phenomena are the most pronounced in the EU15. The Belgian and Finish APPBT of both fuels react in a much faster way and with higher amplitude, just 1 week after the shock, to a rise in the respective Platts CIF (NWE) prices than when these prices fall. In particular, in terms of adjustment delays, the adjustment processes of these APPBT to initial rises and falls of the corresponding Platts CIF (NWE) prices reach the steady state with delays of, respectively, in Belgium 2 and 3 weeks in the case of diesel and 2 and 5 weeks in gasoline and in Finland 1 and 3 weeks in diesel and 1 and 4 weeks in gasoline (see Table above).

1535. Among the EU15 MS where there is evidence of asymmetries, these are less pronounced in the cases of Italy in diesel, Netherlands in gasoline, and Portugal in both fuels, where the asymmetries are only in the adjustment delay, with ARPBR taking 1 week more to fall than to rise following from an initial fall and rise of the corresponding Platts CIF prices respectively.

1536. In particular, in the cases of, respectively, Italy in diesel and the Netherlands in gasoline, a rise of the corresponding Platts CIF (MED and NWE) prices is fully passed-through to an identical rise of the APPBT 4 and 1 weeks after the initial shock, whereas the adjustment to falls on those Platts CIF prices are completed 5 and 2 weeks after the initial shock.

1537. Portuguese APPBT of both fuels take longer to adjust to shocks on the corresponding Platts CIF (NWE) prices. Whilst there is no evidence of asymmetries in the amplitude of adjustment, these APPBT take 1 week more to adjust to a fall in the corresponding Platts CIF prices than they do in case of a rise, 4 against 5 weeks in the case of diesel and 5 against 6 weeks in the case of gasoline (see also Table above).

1538. Notwithstanding, in analogy with the Dutch case, results do not allow to unequivocally conclude that when the adjustment process of the national APPBT to a rise in the corresponding Platts CIF prices is completed, the amplitude of the cumulative adjustment to a fall of those CIF prices (1 week before this adjustment reaches the steady state) is statistically different from the amplitude of adjustment to a rise on those CIF prices.[214]

1539. With the exception of Ireland, Portugal is also the MS of the EU15 where the adjustment process of its APPBT to an initial shock (positive or negative) on the corresponding Platts CIF prices starts the latest, only 2 weeks after the shock. This delay of reaction may, in particular, result from the way national ex-refinery prices have been indexed to the reference Platts CIF (NWE) prices up to the end of 2007 (period which covers more than 80% of the considered time sample), on the basis of the average daily Platts CIF NWE prices over the 2 weeks prior to the setting of ex-refinery prices. This delay has been changed in 01.01.2008 to a single week (see above).

1540. Actually, in analogy with the preliminary findings in the Interim Report (section 3.3), the adjustment of national APPBT to the above defined proxies of ex-refinery prices show evidence of no asymmetries, with the adjustment processes being completed 2 and 3 weeks after the initial shock (positive or negative) in the cases of diesel and gasoline respectively.[215]

1541. However, as above referred, considering these proxies to ex-refinery prices rather than the herein considered Platts CIF prices does not allow either the comparative analysis of the asymmetry phenomenon across the EU15 or the possibility that APPBT might react to Platts CIF price changes before such changes are passed-through to the respective ex-refinery prices, actually, as suggested by the economic literature (*cit*.).

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[214] Formally, this means that in the Dutch and national cases, for an adjustment after k weeks to a rise and $k+1$ weeks to a fall, although B_k^- cannot, as opposed to B_k^+, be considered as statistically equal to 1, results do not also allow to conclude that B_k^- and B_k^+ are statistically different from each other.

[215] See Illustration 31 in Appendix 3.

1542. In contrast, 9 of the 15 MS considered, including the EU15 average, show evidence of a quite fast adjustment process, up to 3 weeks. In particular, in 6 MS – France, Denmark, Germany, Luxembourg, Netherlands, and Sweden – the adjustment process does not last more than 2 weeks. APPBT of these MS thus reflect with high celerity – or almost "in real time" – changes in European reference ex-refinery prices of (motor) liquid fuels (Platts CIF). The higher celerity of adjustment of these MS APPBT to the corresponding Platts CIF prices may possibly, for the reasons referred above, result from a faster indexation of the respective ex-refinery prices to the Platts CIF's than the one adopted in the national case.[216]

1543. It is, however, worth noting that this longer lasting adjustment process of national APPBT to Platts CIF prices characterizes both rises and falls of those Platts CIF prices and is thus not necessarily bad for consumer welfare, notably, in a period of persistent rises in those Platts prices as the one which described the herein considered period (2004-2008).

1544. In analogy with the national case, the Spanish APPBT show also a quite slow adjustment process to Platts CIF prices, with the single exception of the 2 weeks adjustment of the Spanish APPBT for diesel to a fall in the respective Platts CIF price (see also Table 66 above).

1545. In particular, following a 1 cts/lt rise in the Platts CIF price for diesel, 2 weeks after the rise, the national and Spanish APPBT increase up to 0.38 cts/lt (at most 0.54 cts[217]) and 0.46 cts/lt (at most 0.62 cts) respectively, *i.e.* a higher increase in Spain than in Portugal in spite of the fact that in Portugal the adjustment process is completed before the Spanish, after 4 and 6 weeks respectively. Four weeks after that initial rise, the Spanish APPBT cumulates an increase of 0.65 cts/lt (to a maximum of 0.87 cts) against 1 cts/lt (the steady state) in Portugal. In the case of a 1 cts/lt fall of the Platts CIF prices for diesel, 2 weeks after the fall, this is fully passed-through to the Spanish APPBT though the national APPBT falls only up to 0.39 cts/lt (at most 0.55 cts, *i.e.* about half of the fall in Spain).

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216 Preliminary results on the estimation of these models in the national case, but restricted to the year 2008, suggest, indeed, the absence of asymmetries and a much faster adjustment process, of 3 and 2 weeks in diesel and IO95 gasoline respectively. These results may, however, be poorly statistically consistent given both the shortness of the considered time period (52 weeks) and its high volatility, as characterized by a period of strong rise in international prices for both Brent and fuels (Platts) followed by a period of strong (and almost compensating) fall in those prices.

217 These maximal values correspond to the upper limits of the respective 95% confidence intervals (see Appendix 3, Section A3.4.2, for details).

1546. In the case of gasoline, where the adjustment delay, of 5 weeks, is similar between Portugal and Spain, with a slight asymmetry of 1 additional week to a fall in the national case (see Table 66 above), we observe that 2 weeks after an initial 1 cts/lt rise of the reference Platts CIF price, the Spanish APPBT cumulates an increase of 0.53 cts/lt (at most 0.67 cts) against 0.30 cts/lt (at most 0.44 cts) in Portugal. At the same delay of 2 weeks after a 1 cts/lt fall in the reference Platts CIF price, the Spanish APPBT cumulates a fall of 0.63 cts/lt (to a maximal fall of 0.77 cts) against 0.29 cts/lt (at most 0.44 cts) in Portugal.

1547. Apart from the evidence on asymmetries for some EU15 MS, including Portugal, there is also evidence of APPBT behaviour asymmetries between MS. In particular, the Spanish APPBT tend to show, when compared with the Portuguese, a higher adjustment celerity in the short run, between 2 and 3 weeks after the initial rise or fall of the reference Platts CIF prices.

1548. Summing up, though results on the domestic channels "Platts CIF → APPBT" are divided between the evidence in favour and against the asymmetry phenomenon, it must be noted, first, that the economic literature (*cit*.) is not consensual on the existence of this phenomenon over this channel or in the oil sector in general. Moreover, the present results may also be the by-product of the type of data considered in this analysis, aggregated both over space since we focus on national retail price averages, not on retail prices at a local market level, and over time by considering weekly series rather than elements in a shorter frequency such as the daily.[218]

1549. In particular, the time aggregation effect of considering weekly (rather than daily) data may compensate positive and negative price changes that may occur within the same week, thus implying *per se* an adjustment process (in number of weeks) longer and less asymmetric than the one that would result from intra-weekly frequency, such as the daily. For instance, in case ex-refinery prices are indexed to last week Platts CIF prices (as in the national case since the beginning of 2008), once this average Platts CIF prices is known (partially or totally), daily APPBT may start adjusting, without such an adjustment (probably marginal) being necessarily reflected in their weekly average or in a way that it can be related with that Platts change.

[218] See, in particular, Geweke (2004) comments on the inexistence of consensus in the economic literature on the asymmetry phenomenon as well as on the empirical effects of the time and spatial aggregation problems.

1550. Analogously, spatial aggregation may also compensate possible different local market and/or inter-brand price changes which are thus not passed-through to the final national aggregated APPBT.

1551. Notwithstanding, although this type of more disaggregated analysis, over time and over space, is left for further research, this type of analysis can be hardly extended to the entire EU15 since the available information at this level is restricted to the one we consider in the present analysis.

1552. Keeping these *caveats* in mind, we present below the results on the integrated channel "Brent → APPBT" (subsection 12.3.3).

12.3.3. Asymmetries in the integrated channel "Brent → APPBT"

1553. As above referred, this channel "Brent → APPBT" results, per fuel (diesel and IO95 gasoline), from the integration of the estimation results related with the two previously analyzed channels.

1554. As shown in Appendix 3 (section A3.2), this integration is not additive but of a polynomial type so that it may attenuate or amplify the asymmetry results of the latter two channels.[219]

1555. Economically speaking, the channel "Brent → APPBT" is related with the comparative evolution between APPBT and the price for Brent, which may reflect an adjustment process different from the one that would result from the simple addition of the adjustments "Brent → Platts CIF" and "Platts CIF → APPBT".

1556. Moreover, since APPBT are directly related with Platts CIF prices, notably, through the indexation of European ex-refinery prices to reference Platts CIF prices, and only indirectly related with the price for Brent, through the relation Platts CIF prices have with this latter, nothing implies that the adjustment process of APPBT to the price for Brent is the sum of the adjustment processes "Brent → Platts CIF" and "Platts CIF → APPBT".

1557. In particular, we observe that the symmetric adjustment, in a 4 weeks delay, of the national APPBT for gasoline to the price for Brent (see Table 67 below) is in nothing related with the asymmetric adjustment of that APPBT

[219] See also Appendix 3, Section A3.2 for the way the IRF related with this integrated channels are derived and Section A3.4.3 for details on the respective empirical findings.

to a rise and a fall of the reference Platts CIF price up to 5 and 6 weeks respectively (see subsection 12.3.2 above).

1558. Keeping these comments in mind, results over the integrated channel "Brent → APPBT" reveal that, in the case of IO95 gasoline, although there are no asymmetries in the international channel "Brent → Platts CIF" (subsection 12.3.1 above) for this fuel, these characterize the integrated domestic channels "Brent → APPBT" in a different way from those in the previous domestic channels "Platts CIF → APPBT".

1559. Whilst (as afore referred) the channel "Platts CIF → APPBT" for gasoline is characterized by asymmetries in Greece, Denmark, Finland, Germany, the Netherlands, and Portugal (and Ireland), the integrated domestic channels "Brent → APPBT for gasoline" present asymmetries, at the levels of both the delay and amplitude of adjustment,[220] for Austria, Greece, Italy, Belgium, Finland (and Ireland), being thus absent, in particular, in Germany, Portugal, and Netherlands (see Table 67 below).

Table 67 – Adjustment delays (in number of weeks) of APPBT in the EU15, for diesel and gasoline, to a rise and a fall of the price for Brent (1-month futures) and weeks over which lasts the overshooting phenomenon in the adjustment of the APPBT for diesel to a rise in the price for Brent

	Diesel			IO95 Gasoline	
	Rise	Fall	Overshooting	Rise	Fall
Austria	**2**	**3**		**3**	**6**
Greece	**2**	**4**		**2**	**3**
Italy	**2**	**5**		**4**	**6**
Spain	3			5	
France	**2**	**3**	**4 - 5**	2	
Belgium	**2**	**4**	**2 - 8**	**2**	**3**
Denmark	**1**	**4**	**3 - 8**	1	
Finland	**1**	**4**		**1**	**2**
Germany	**1**	**2**	**4**	3	2
Ireland	**6**	**8**		**7**	**8**
Luxembourg	**1**	**2**	**4 - 6**	2	
Netherlands	1			1	
Portugal	**3**	**6**	**5 - 11**	4	
Sweden	**1**	**3**	**5**	1	
UK	4			6	4
EU15 Average	**2**	**3**	**3 - 9**	3	2

Legend: Shadow areas indicate the asymmetry cases and in the adjustment delay if numbers are in bold. Columns with the same number indicate the same adjustment delay to rises and falls.

[220] The asymmetries in the amplitude of adjustment in the integrated channel "Brent → APPBT" do not, as opposed with those in the channel "Platts CIF → APPBT" (Section 10.3.2), go beyond the cases characterized by asymmetries in the adjustment delay (see also Appendix 3, Section A3.4.3).

1560. Also in the case of gasoline, we observe that whilst the national APPBT (fully) adjusts with a 5 and 6 weeks delay to a rise and a fall of the reference Platts CIF (NWE) price respectively, when compared with the price for Brent, this delay shrinks to 4 weeks and symmetrically to rises and falls of this price. The Spanish APPBT for gasoline shows, instead, the same delay, of 5 weeks, of full adjustment to either a rise or a fall of both the reference Platts CIF and Brent prices. The Belgian and Finish cases in gasoline are also of interest: whilst the Belgian / Finish APPBT fully adjust, respectively, with a 2 and 5 / 1 and 4 weeks delay to a rise and a fall of the reference Platts CIF (NWE) price, they take less to fully adjust to a rise and a fall in the price for Brent, 2 and 3 / 1 and 2 weeks respectively.

1561. Overall and regarding gasoline, results indicate thus 8 and 6 asymmetry cases in the channels "Platts CIF → APPBT" and "Brent → APPBT" respectively.

1562. In contrast, the integrated domestic channels "Brent → APPBT for diesel" clearly show an increasing number of cases of asymmetry when compared with the previous channels "Platts CIF → APPBT" (subsection 12.3.2). In these integrated channels for diesel, the asymmetry phenomenon characterizes almost all cases considered, including the EU15 average, with the 3 exceptions of Spain, Netherlands, and UK whose APPBT react in a symmetric way, with the same adjustment delay and amplitude, to rises and fall of the price for Brent. In the previous domestic channels "*Platts* CIF → APPBT for diesel", the asymmetry phenomenon was only present in the cases of Italy, Belgium, Finland, Germany, and Portugal.

1563. Regarding diesel, we further observe that for all cases considered, including those free from asymmetries, the APPBT adjust with a higher celerity (or at least not lower) to a rise in the price for Brent than to a rise in the reference Platts CIF price and with a lower celerity (or at least not higher) to a fall in the price for Brent than to a fall in the reference Platts CIF price. The same result does not hold, with the same consensus common to the entire EU15, in the case of gasoline.

1564. Moreover, in 7 MS of the EU15, including the EU15 average, there is further evidence of overshooting in the reaction of APPBT for diesel to a rise in the price for Brent. This phenomenon characterizes the cases of France (4 and 5 weeks after the rise in the price for Brent), Belgium (from the 2nd to the 8th weeks following the initial shock), Denmark (from the 3rd to the 8th weeks

after the shock), Germany (in the 4th week after the shock), Luxembourg (from the 4th to the 6th weeks after the shock), Portugal (from the 5th to the 11th weeks after the shock), Sweden (in the 5th week after the shock), and the EU15 average, from the 3rd to the 9th weeks after the rise in the price for Brent (see Table 67 above).

1565. As results above indicate, this overshooting phenomenon is likely to stem from the international channel "Brent → Platts CIF" (subsection 12.3.1) – as it does not show up in the domestic relations "Platts CIF → APPBT" (subsection 12.3.2) – where Platts CIF prices increase more than the rise in the price for Brent during the first 8 and 5 weeks after that shock on Brent in the zones NWE and MED respectively.

1566. These results on diesel, both of the higher celerity of adjustment of APPBT for diesel to the price for raw material (Brent) than to the reference ex-refinery price (Platts CIF) and of the overshooting phenomenon, inexistent in the case of gasoline, are likely the by-product of the higher pressure that the price of raw material (Brent) puts in both the Platts CIF prices and the APPBT for diesel than for gasoline as a result of the factors referred above (subsection 12.3.1) related with the higher importance of diesel in European consumption (above 2/3), when compared with gasoline, and of the European refining capacity deficit in diesel, with Europe being a net exporter of gasoline, in particular, to the US.

12.4. Concluding comments

1567. In spite of a large strand of the literature on the asymmetry phenomenon – developed after the contribution of Bacon (1991), the first to detect evidence in favour of this phenomenon in the UK retail sales of gasoline – the empirical contributions (as overviewed by Geweke, 2004) are not consensual on the existence of this phenomenon, in particular, on the way retail prices for motor liquid fuels adjust to changes both in ex-refinery and crude prices.

1568. In the December 2008 Interim Report (in its section 3.3), we have assessed, in a preliminary way, whether this phenomenon characterized the way national average retail prices for diesel and IO95 gasoline (the most important motor liquid fuels in Portugal and in Europe in general) adjusted to both national ex-refinery prices and to the price for raw material (Brent).

For this purpose, we have followed the econometric methodology proposed by Borenstein *et al.* (1997), in analogy with which, we have disentangled between the two major channels on the national retail prices formation, namely "Brent → Ex-refinery" and "Ex-refinery → APPBT (average pump prices before tax)". Ex-refinery prices have been defined not as the effective prices but in the way they are indexed to reference Platts CIF NWE prices.

1569. The preliminary results from this analysis were in favour of the asymmetry phenomenon over both channels but, notably, in the international adjustment of ex-refinery (Platts CIF) prices to the price for Brent.

1570. However, the use of Platts CIF prices rather than ex-refinery's is supported by a stronger economic *rationale*. First, we cannot *a priori* exclude the possibility that APPBT react to changes in Platts CIF prices, before these are passed-through to ex-refinery prices, in anticipation of future changes in ex-refinery prices, actually, as suggested by the economic literature (*v.g.*, Borenstein & Shepard, 1996). Moreover, considering Platts CIF prices rather than ex-refinery's allows further the comparative analysis of the asymmetry phenomenon across the EU15 (although not the entire EU, notably, for reasons of retail price information availability).

1571. The aim of the present analysis was, therefore, to extend the scope of that preliminary analysis to all the EU15 Member States, including the EU15 average, by distinguishing between the two major channels of retail price formation in Europe, namely "Brent → Platts CIF" and "Platts CIF → APPBT" for diesel and IO95 gasoline. In analogy with that preliminary analysis, we have considered weekly data, but over the entire period 2004-2008, covering, in particular, the strong downward movement of Platts CIF and Brent prices observed during the last quarter of 2008, a period which has been left uncovered in the previous December 2008 Interim Report.

1572. To pursue the analysis over the entire EU15, we have further considered the two European Platts reference zones, the NWE (for the North Western Europe) and the MED (for the Mediterranean Europe), where part of the Spanish and French markets are included.

1573. Results reveal, first and in opposition with Borenstein *et al.* (1997) findings for the US market, the absence of endogeneity in international relations, *i.e.* of a bi-directional causality:

a. Between Platts CIF (NWE and MED) and Brent prices, with the causality being, as desired, in the direction "Brent → Platts CIF"; and

b. Between the Platts FOB (NWE and MED) and the 1-month futures price in the NYMEX for gasoline, with the causality being in the direction "NYMEX → Platts FOB (NWE and MED) for gasoline", as previously suggested in the June 2008 Report (in its section 4.2).

1574. More specifically, empirical findings are somewhat consistent with the absence of consensus in the economic literature on the existence of the asymmetry phenomenon, as they suggest the existence of this phenomenon but depending on the channel, fuel, and Member State considered.

1575. Results further reveal that both adjustment processes related with the channels "Brent → Platts CIF" and "Platts CIF → APPBT" reach the steady state, after some adjustment delay, at a level identical to the initial change of the corresponding channel's control variable.

1576. Summing up, empirical findings show that:

(i) Regarding diesel, the asymmetry phenomenon is more pronounced in the international channel "Brent → Platts CIF", though it also characterizes some domestic channels "Platts CIF → APPBT", notably, in the cases of Belgium and Finland, and with a lower intensity in the cases of Italy, Germany, and Portugal;

(ii) Regarding IO95 gasoline, there is no statistical evidence of the asymmetry phenomenon in the international channels "Brent → Platts CIF (NWE and MED)" and "NYMEX → Platts FOB (NWE and MED)", but only in some domestic channels "Platts CIF → APPBT", in Greece, Belgium, Finland, and Germany, and with lower intensity in the cases of Netherland and Portugal.

1577. Moreover, in the case of diesel (but not gasoline), there is further evidence of overshooting in the international channel "Brent → Platts CIF" (but not in the domestic channels), *i.e.* that Platts CIF prices for diesel adjust more than proportionally to a rise in the price for Brent up to 8 and 5 weeks after the rise in zones NEW and MED respectively, after which they revert to the same cumulative increase as the initial rise in the price for Brent.

1578. The integration of the channels "Brent → Platts CIF" and "Platts CIF → APPBT" into the channel "Brent → APPBT" amplifies the asymmetry and phenomenon (and overshooting) in the case of diesel and slightly attenuates it in the case of gasoline.

1579. In particular, whilst there is a slight 1 week adjustment delay asymmetry in the national channel "Platts CIF → APPBT for gasoline", this asymmetry disappears in the channel "Brent → APPBT", where this APPBT adjusts in the same way and fully after 4 weeks to a rise and a fall in the price for Brent.

1580. In the channel "Brent → APPBT for diesel", there is evidence of asymmetries, both in the adjustment delay and amplitude, for all cases considered, including the EU15 average, with the 3 exceptions of Spain, Netherlands, and the UK.

1581. Also regarding this channel, results reveal that, in all cases considered including those with no asymmetries, the APPBT for diesel adjust with higher celerity (or at least not lower) to rises in the price for Brent than in reference Platts CIF prices and with lower celerity (or at least not higher) to falls in the price for Brent than in the corresponding Platts CIF price.

1582. Results reveal, in addition and in analogy with the channel "Brent → Platts CIF (NWE and MED)" for diesel (but not gasoline), the existence of an overshooting phenomenon in the integrated channels "Brent → APPBT for diesel", *i.e.* that APPBT for diesel adjust to a rise in the price for Brent by increasing more than that rise over some period of time. The overshooting phenomenon in these integrated channels characterize 7 EU15 MS, including the EU15 average, namely France, Belgium, Denmark, Germany, Luxembourg, Portugal, and Sweden, and its duration varies between 1 week (Germany and Sweden) and 8 weeks (Portugal and the EU15 average).

1583. These results on diesel, both of the higher celerity of adjustment of their APPBT to the price for raw material (Brent) than to the reference ex-refinery price (Platts CIF) and of the overshooting phenomenon, inexistent in the case of gasoline, are likely the by-product of the higher pressure that the price of raw material (Brent) puts in both the Platts CIF prices and the APPBT for diesel than for gasoline as a result of the factors referred above (subsection 12.3.1) related with the higher importance of diesel in European consumption (above 2/3), when compared with gasoline, and of the European refining capacity deficit in diesel, with Europe being a net exporter of gasoline, in particular, to the US.

1584. The present analysis opens, however, some issues which shall be left for further research, notably, the due economic interpretation of the empirical findings based upon the existing literature on the subject (*cit*.). The proposed econometric modelling may also require some rethinking,

although, according to Geweke (2004), it reflects the present state of the art. This rethinking includes the way the two regimes of rises and falls are disentangled, with this being deterministic rather than stochastic as the considered co-integration modelling would presume (see *v.g.*, the recent methodology proposed by Honarvar, 2009)[221]. It further includes the need to adjust such type of models to higher frequency data, such as the daily, whilst co-integration models are usually better suitable to lower frequency data.

[221] Honarvar, A. (2009), "Asymmetry in Retail Gasoline and Crude Oil Price Movements in the United States: An Application of Hidden Cointegration Technique", *Energy Economics*, 31: 395-402.

B. Gas as fuel

13. Characteristics of the market for bottled butane and propane

13.1. Introductory notes

1585. The aim of this section is to describe the market in mainland Porrtugal for gas as fuel produced from oil (LPG).

1586. This will be followed by an overview of international production, consumption and trade in LPG.

1587. The following point contains a description of the value chain for gas used a fuel, from the stage of production /import to the sale to customers in bottle, in bulk or piped. In this context, aspects of the supply of LPG are described, in terms of those involved in the various stages and of the infrastructures used at each stage of the value chain.

1588. This is followed by a summary of the regulations covering LPG in Portugal, in terms of the technical specifications for butane and propane, pricing, the tax regime and aspects of storage and distribution.

1589. The following point aims to describe moves in demand for LPG in mainland Portugal, along with consumption patterns in terms of the way it is sold, the type of product, geographical spread and sectors where it is used. There are also a number of variables identified which may help explain the moves in demand for LPG observed over the last decade.

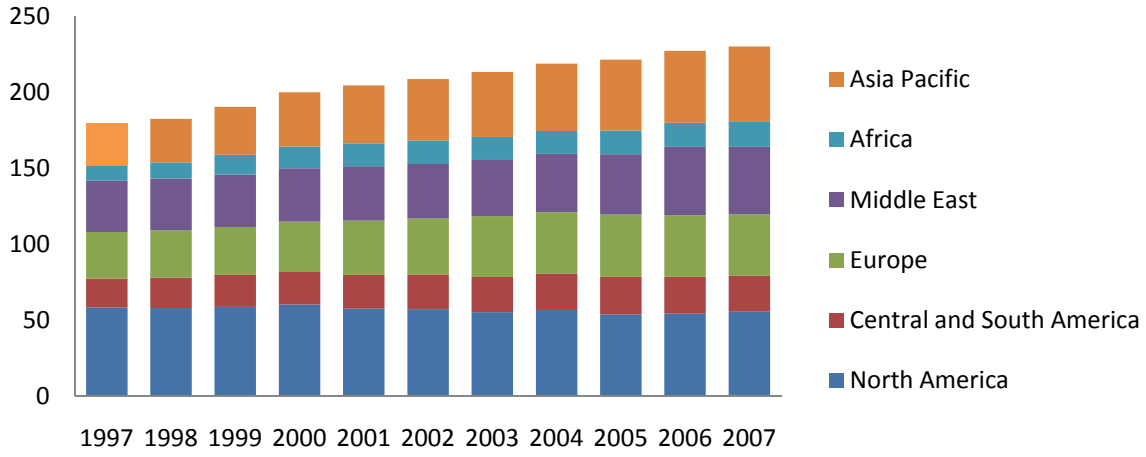
1590. Lastly, there is an analysis of the prices and margins for butane and bottled propane along the value chain, specifically moves in the quotations for LPG in the international markets used as a reference, the prices charged by suppliers, and the first and second line vendors and their margins. The section concludes with a comparison of retail prices in a selection of countries in Europe.

13.2. International framework

13.2.1. Production

1591. In the period from 1997 to 2007, world production of LPG increased from 179,875 10^3 tons (1997) to 230,354 10^3 (2007), corresponding to a growth of around 28%. There were, however, different rates of growth in different regions of the world. In the period under review, the biggest growth was, in relative terms, in the Asian Pacific region (75%), from 28,136 10^3 tons in 1997 to 49,139 10^3 tons in 2007 and in Africa (70%), from 9,986 10^3 tons in 1997 to 16,946 10^3 tons in 2007. In North America production fell (by 5%) from 58,256 10^3 in 1997 to 55,482 10^3 tons in 2007. In Europe there was a rise from 30,634 10^3 in 1997 to 40,401 10^3 tons in 2007.

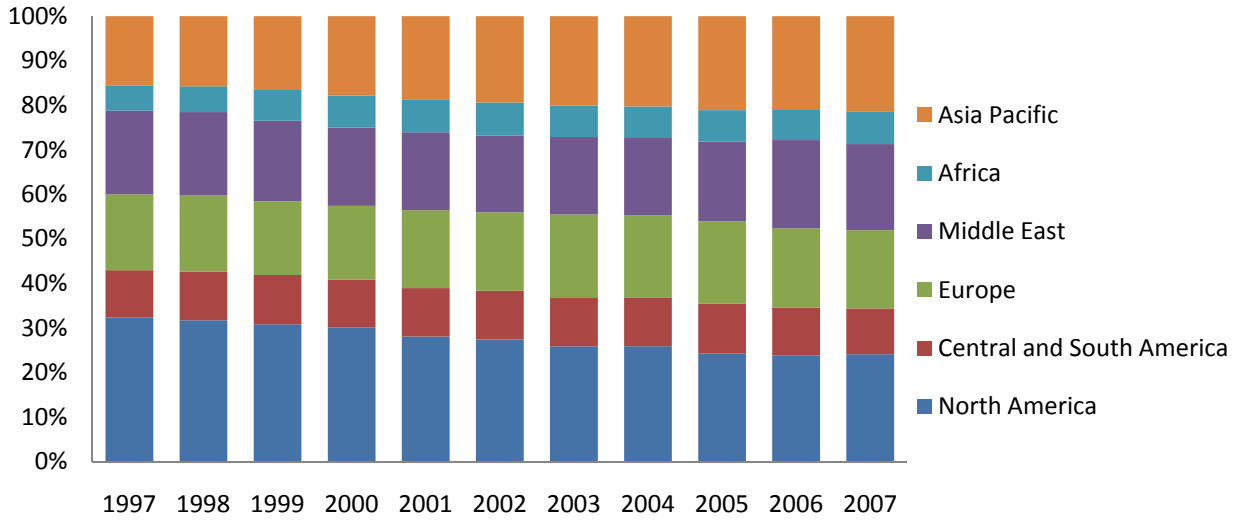
Chart 102 – Production of LPG, by region during 1997 to2007, in 10^6 tons



Source: World LP Gas Assotiation (2008).

1592. The situation in terms of the share of world production remained relatively stable between regions. In 1997, North America occupied the first place (32%), followed by the Middle East (19%), Europe (17%), the Asian Pacific (16%), Central and South America (11%) and Africa (6%). In 2007, North America occupied the first place (24%), followed by the Asian Pacific (21%), the Middle East (19%), Europe (18%), Central and South America (10%) and Africa (7%). In relative terms, the Asian Pacific region grew in importance, (by 5 p.p.) and there was a fall in the North American region (by 8 p.p.).

Chart 103 – Shares of world production of LPG by region in the period from 1997 to 2007



Source: World LP Gas Assotiation (2008).

1593. The two biggest producers accounted for around 36% of world production in 1997, the four biggest for around 46% and the top ten for around 64%. The figures in 2007 were around 29%, 40% and 61% of world production respectively. In the period under review the most important producers were the United States and Saudi Arabia.

1594. There was also an increase in the share of China, from 3% in 1997 to 7% in 2007. During the ten-year period, India and Brazil came into the group of 10 biggest producers in the world.

Table 68 – The ten biggest producers in 1997 and in 2007

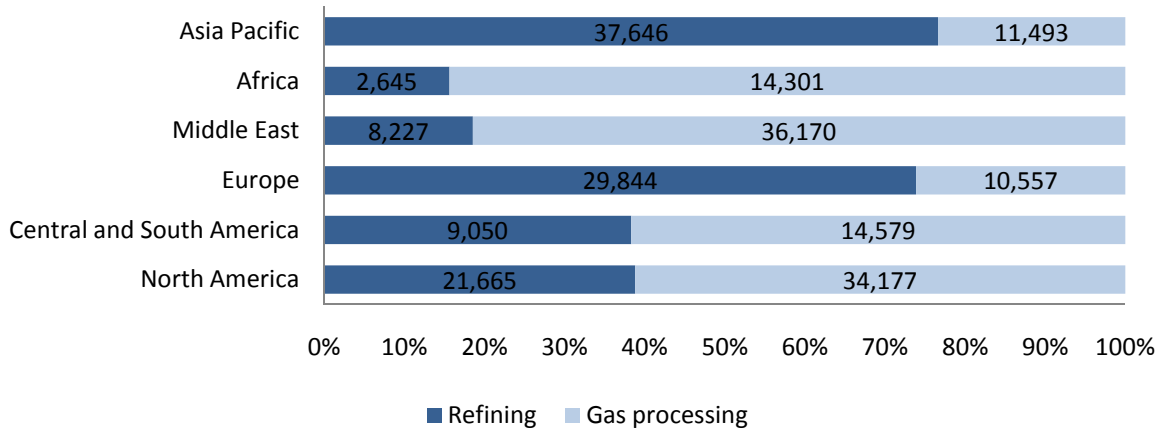
1997			2007		
Country	Production (10^3 tons)	Share	Country	Production (10^3 tons)	Share
United States	46,811	26%	United States	45,577	20%
Saudii Arabia	18,100	10%	Saudi Arabia	21,000	9%
Canada	11,445	6%	China	15,200	7%
Algeria	6,700	4%	Russia	10,600	5%
Mexico	6,690	4%	Canada	10,265	4%
United Kingdom	6,200	3%	Algeria	9,300	4%
United Arab Emirates	5,272	3%	India	8,973	4%
China	5,116	3%	United Arab Emirates	7,933	3%
Russia	4,751	3%	Mexico	7,081	3%
Japan	4,623	3%	Brazil	5,646	2%
Others	64,167	36%	Others	88,779	39%

Source: World LP Gas Association (2008)

1595. Around 47% of the LPG produced in the world comes from refining and 53% from processing natural gas. The panorama is varied and the "image" differs according to the region.

1596. In Europe and the Asian Pacific, around 74% and 77% of the production of LPG (corresponding to 29,844 10^3 tons and 37,646 10^3 tons, respectively) comes from refining, while in other regions there is predominantly natural gas. This accounts for around 84% of production in Africa (14,301 10^3 tons), 81% in the Middle East (36,170 10^3 tons), 62% in Central and South America (14,579 10^3 tons) and 61% in North America (34,177 10^3 tons). In Portugal all the LPG produced comes from refining.

Chart 104 – Forms of production of LPG, per region as a % and in 10^3 tons in 2007



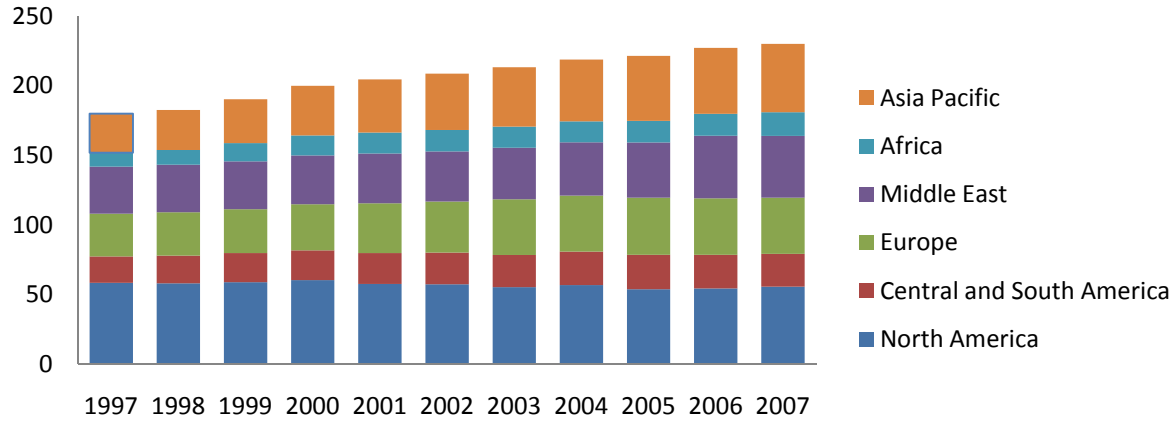
Source: World LP Gas Assotiation (2008).

13.2.2. Consumption

1597. In the period from 1997 to 2007, world consumption of LPG increased from 178,427 10^3 tons (1997) to 233,427 10^3 (2007), corresponding to a growth of around 31%. There were, however, different rates of growth in different regions. The biggest growth in relative terms during the period under review was in the Middle East (91%), from 9,280 10^3 tons in 1997 to 17,718 10^3 tons in 2007, in Africa (66%), from 6,102 10^3 tons in 1997 to 10,148 10^3 tons in 2007 and in the Asian Pacific (57%), from 48,199 10^3 tons in 1997 to 75,763 10^3 tons in 2007. In Europe there was a 30% growth, from 32,947

10^3 tons in 1997 to 42,694 10^3 tons in 2007, and in Central and South America (16%), from 23,775 10^3 tons to 27,480 10^3 tons in 2007.

Chart 105 – Consumption of LPG per region from 1997 to 2007, in 10^3 tons

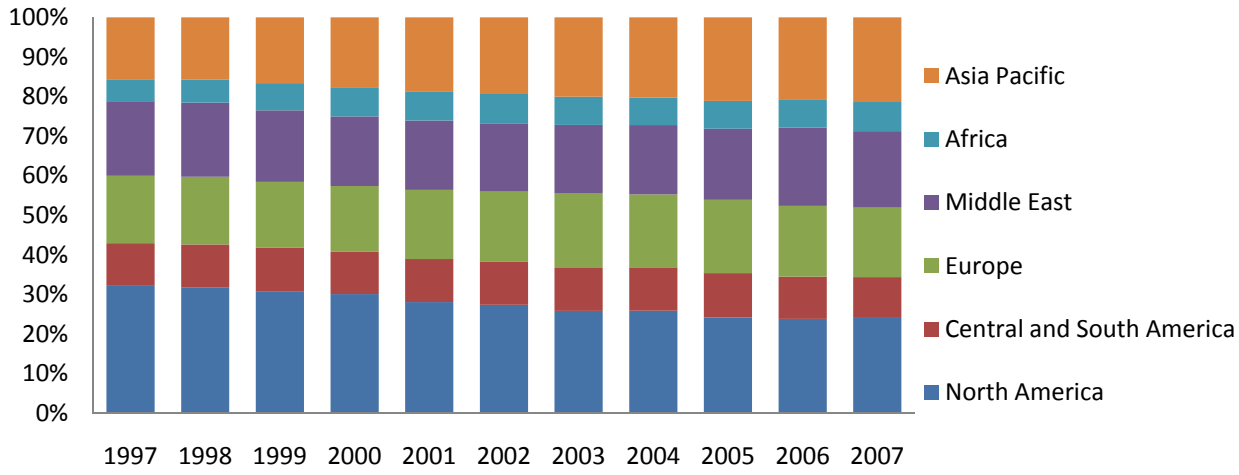


Source: World LP Gas Assotiation (2008).

1598. In terms of the share of world consumption, the situation between regions is relatively stable. In 1997, North America occupied the first place (33%), followed by the Asian Pacific (27%), Europe (18%), Central and South America (13%), the Middle East (5%) and Africa (3%). In 2007 the Asian Pacific region occupied the first place (32%), followed by North America (26%), Europe (18%), Central and South America (12%), the Middle East (8%) and Africa (4%).

1599. In relative terms, there was an increase in the Asian Pacific region (5 p.p.) and a fall in the North American region (7 p.p.).

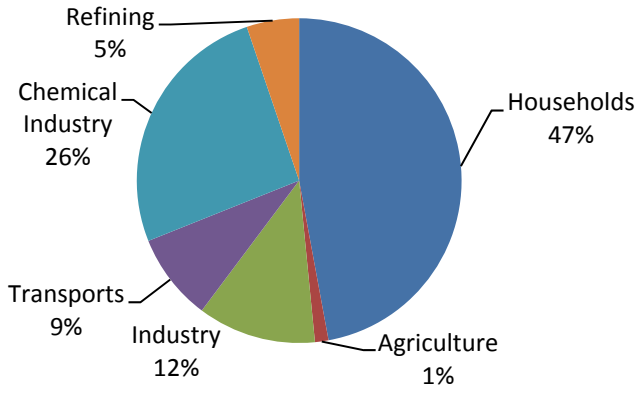
Chart 106 – Shares of world production of LPG per region during the period from 1997 to 2007



Source: World LP Gas Assotiation (2008).

1600. In global terms, LPG is consumed mainly in the domestic sector (47%), followed by the chemical industry (26%).

Chart 107 – Consumption of LPG per sector in 2007

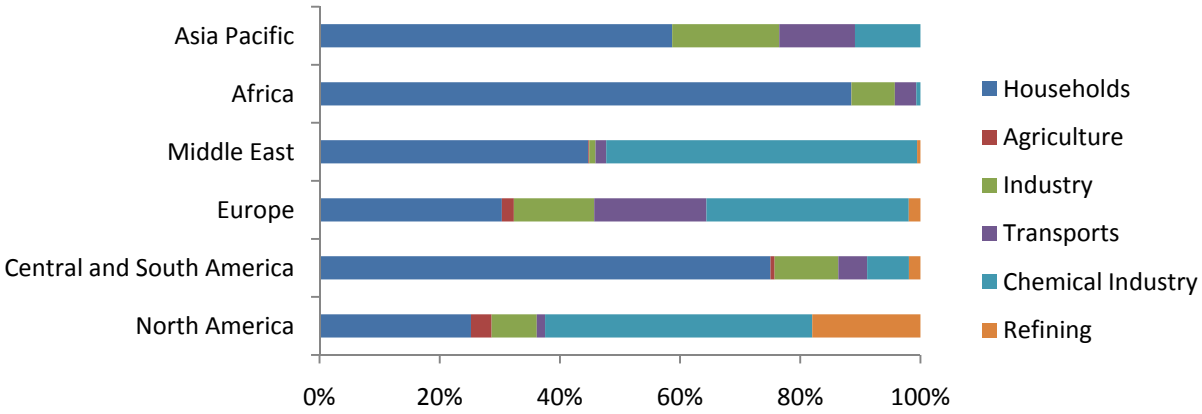


Fonte: World LP Gas Assotiation (2008).

1601. In regional terms, the domestic sector accounts for a portion of consumption that is higher than the average in Africa (88%), in Central and South America (75%) and in the Asian Pacific region (59%), whereas it is lower in the Middle East (45%), Europe (30%) and North America (25%). In Europe, 34% of LPG consumed is in the chemical industry, 30% in the domestic

sector, 19% in transport, 13% in industry, 2% in agriculture and 2% in refining.

Chart 108 – Consumption of LPG per sector and per region in 2007



Source: World LP Gas Assotiation (2008).

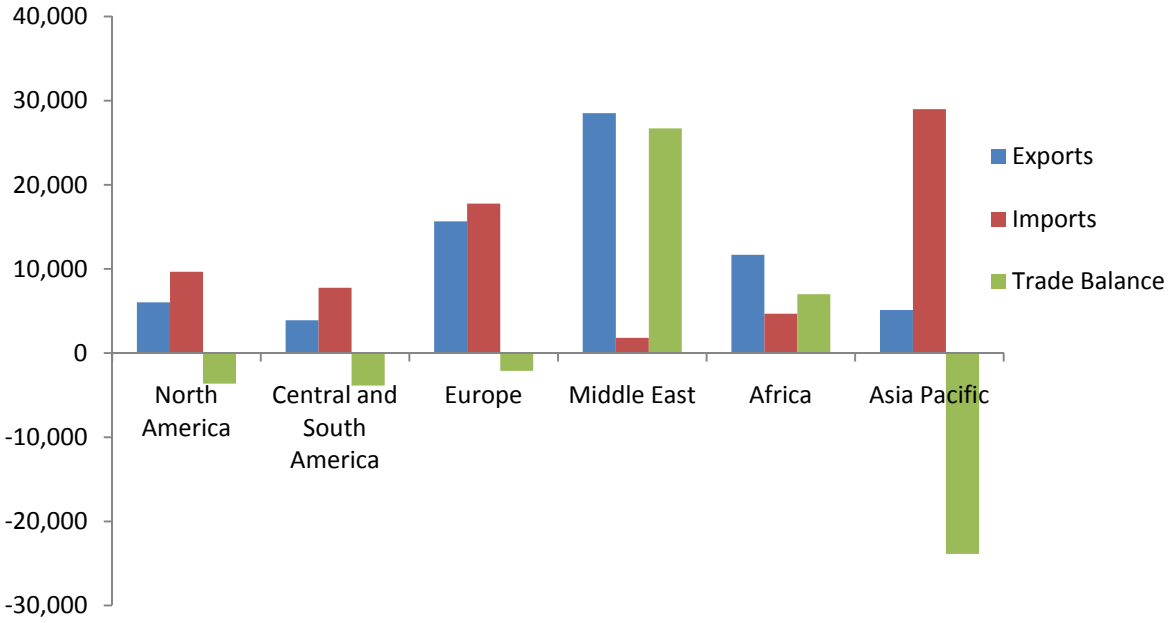
13.2.3. International trade

1602. In regional terms, the biggest volume of world exports in 2007 came from the Middle East (28,521 10^3 tons), followed by Europe (25,665 10^3 tons) and Africa (11,686 10^3 tons). In the same year, exports from the regions of North America, the Asian Pacific and Central and South America were 6,037 10^3 tons, 5,125 10^3 tons and 3,908 10^3 tons respectively.

1603. As for global imports in the same year, the biggest volumes were recorded in the Asian Pacific region (28,994 10^3 tons), Europe (17,777 10^3 tons) and North America (9,660 10^3 tons). Imports into North America, Africa and the Middle East were 7,773 10^3 tons, 4,691 10^3 tons and 1,809 10^3 tons respectively.

1604. The regional trade balance was positive in the Middle East (26,712 10^3 tons) and Africa (6,995 10^3 tons), corresponding to a rate of cover of 1577% and 249% respectively. The other regions recorded a negative regional trade balance of -23,869 10^3 tons in the Asian Pacific, -3,865 10^3 tons in Central and South America, -3,623 10^3 tons in North America and -2,112 in Europe. Exports offset around 88% of the imports in Europe, 62% in North America, 50% in Central and South America and 18% in the Asian Pacific.

Chart 109 – Exports, Imports and the trade balance in 2007, in €/ton



Source: World LP Gas Assotiation (2008).

1605. Imports in 2007 represented around 46% of consumption in Africa, 42% in Europe, 38% in the Asian Pacific region, 28% in Central and South America, 16% in North America and 10% in the Middle East. In the same year, the proportion of exports to production was 69% in Africa, 64% in the Middle East, 39% in Europe, 17% in Central and South America, 11% in North America and 10% in the Asian Pacific region.

Table 69 – Indicators of foreign trade per region in 2007

Region	Production (a)	Exports (b)	Imports (c)	Consumption (d)	Trade balance (b) -(c)	Rate of Cover (b)/(c) x 100	Proportion of imports in Consumption (c)/(d)	Proportion of exports in Production (b)/(a)
North America	55,842	6,037	9,660	59,624	-3,623	62%	16%	11%
Central and South America	23,629	3,908	7,773	27,480	-3,865	50%	28%	17%
Europe	40,401	15,665	17,777	42,694	-2,112	88%	42%	39%
Middle East	44,397	28,521	1,809	17,718	26,712	1577%	10%	64%
Africa	16,946	11,686	4,691	10,148	6,995	249%	46%	69%
The Asian Pacific	49,139	5,125	28,994	75,763	-23,869	18%	38%	10%

Source: World LP Gas Association (2008)

1606. In the North American region, the USA recorded a negative regional trade balance in LPG (-7,593 10^3 tons), corresponding to 18% of production of LPG and Canada recorded a positive trade balance (3,970 10^3 tons), corresponding to 39% of production. It is clear from this that the USA, in spite of being the biggest producers in the world, still needed imports of LPG to satisfy domeic demand.

1607. In Central and South America, the main producers of LPG, Mexico (7,081 10^3 tons) and Brazil (5,646 10^3 tons), recorded a negative trade balance, of -2,454 10^3 tons and -977 10^3 tons respectively. Imports represented 26% of consumption in Mexico and 15% in Brazil.

1608. In Central and South America, Venezuela occupies the third place in terms of production (4,320 10^3 tons) and Argentina the fourth (3,028 10^3 tons). They had the biggest trade surpluses for LPG in the region, (1,330 10^3 tons and 1,152 10^3 tons respectively).

1609. In Europe and Eurasia, the biggest producers are net exporters. Russia produced 10,600 10^3 tons and recorded a positive trade balance of 1,300 10^3 tons, the United Kingdom produced 5,639 10^3 tons and recorded a positive trade balance of 1,928 10^3 tons, and Norway, with a production of 5,315 10^3 tons, recorded a balance of 4,180 10^3 tons. Norway is the biggest European exporter (4,380 10^3 tons). The countries with the biggest volume of imports were Turkey (2,826 10^3 tons), France (2545 10^3 tons), the

Netherlands (2,292 10^3 tons), Poland (2,228 10^3 tons), and Italy (1,515 10^3 tons).

1610. In the Iberian Peninsula, both Portugal and Spain are net importers of LPG. Portugal has a deficit on its trade balance of 464 10^3 tons and Spain has a deficit of -885 103 tons. Rates of cover are 16% and 7% respectively. In Portugal, exports came to 29% of production and imports 72% of consumption, while in Spain the figures were 5% and 46% respectively.

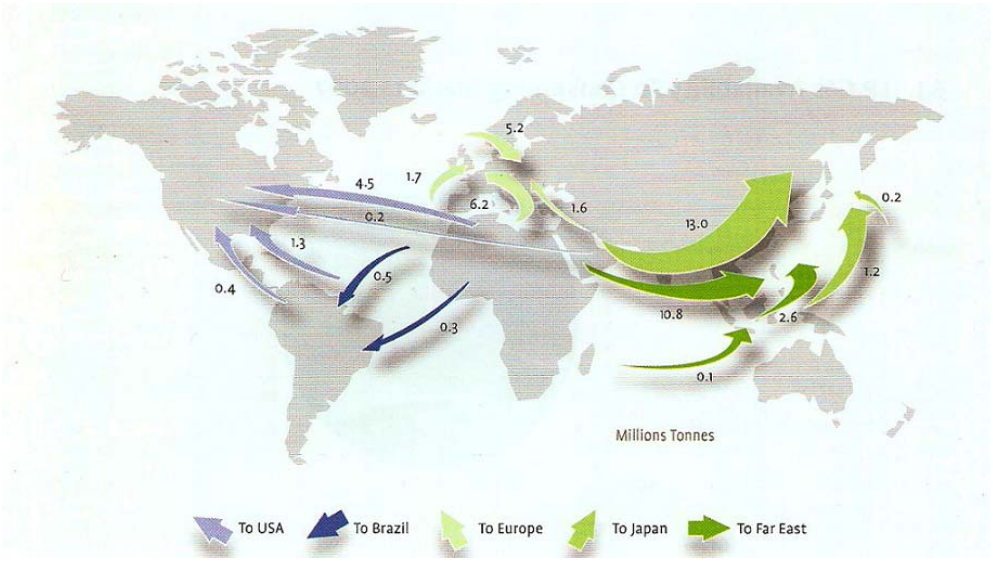
1611. The countries of the Middle East are the biggest producers. Saudi Arabia (21,000 10^3 tons), the United Arab Emirates (7,933 10^3 tons), Iran (5,450 10^3 tons) and Kuwait (3,515 10^3 tons), are net exporters of LPG, with a positive trade balance of 11,782 10^3 tons, 6,896 10^3 tons, 2,950 10^3 tons and 3,399 10^3 tons, respectively.

1612. In Africa, the main producers, Algeria (9,300 10^3 tons) and Nigeria (2,400 10^3 tons) recorded positive trade balances of 7,700 10^3 tons and 2,160 10^3 tons respectively. In these countries imports were residual. The biggest negative trade balances were recorded in Egypt (-2,070 10^3 tons) and Morroco (1,605 10^3 tons).

1613. In the Asian Pacific region, the main producers, China (15,200 10^3 tons), India (8,973 10^3 tons) and Japan (4,621 10^3 tons) are net importers of LPG, with negative trade balances of 3,717 10^3 tons, 2,598 10^3 tons and 13,364 10^3 tons respectively.

1614. As for import flows of LPG in 2007, around 88% of the imports into Europe came from the Middle East (1.6 10^3 tons), the North Sea (5.2 10^3 tons) and Algeria (6.2 10^3 tons). The commercial flows of LPG for the same year are on the following map.

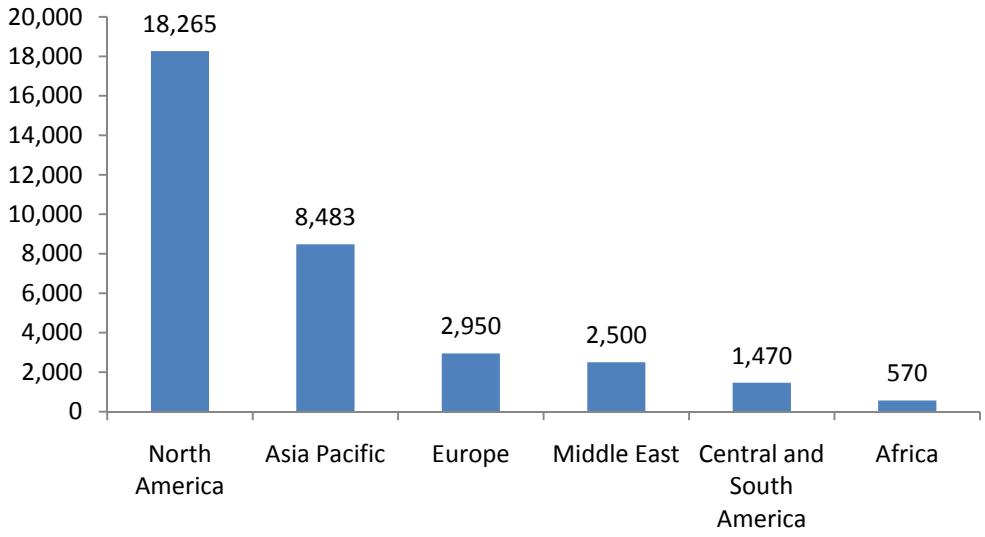
Ilustração 10 –Map showing commercial flows of LPG, in 2007



Source: World LP Gas Association (2008)

1615. In terms of capacity in the terminals where there are imports and exports of LPG, the biggest capacity is in North America (18.265 10^3 tons) and in the Asian Pacific region (8.483 10^3 tons) and the smallest are in Africa (570 10^3 tons) and in Central and South America (1.470 10^3 tons). In Europe, capacity was 2.950 10^3 tons in 2007. Here, the countries with the biggest capacity are the United Kingdom (662 10^3 tons), Sweden (510 10^3 tons) and France (405 10^3 tons). Portugal has a capacity for 62 10^3 tons of LPG.

Chart 110 – Biggest capacity in terminals for import and export per region in 2007, in 10^3 tons



Source: World LP Gas Assotiation (2008).

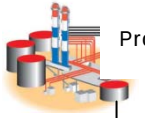
13.3. The LPG value chain

1616. In this section there is a description of the value chain for gas as fuel, from production/import up to sales to the customer in bottle, in bulk or piped.

1617. The following picture gives a simplified view of the LPG value chain.

PRODUCTION. LPG is produced from crude.

Extraction of crude

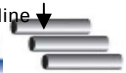


Production unit of natural gas

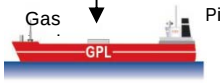
TRANSPORT. By sea, *pipeline* or railway

Tanker

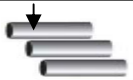
Pipeline



Gas



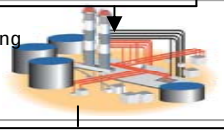
Pipeline



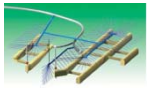
Tank cars, Railway trasnport

REFINING AND STORAGE. LPG can be obtained through refining methods. It can be stored in tanks under pressure, in underground storage, and also refrigerated or semi-refrigerated.

Refining



Storage in tanks under pressure, refrigerated and semirefrigerated.



Underground storage

TRANSPORT. LPG is transported by butane tankers, tank cars, pipeline and tanker trucks to intermediate storage units..

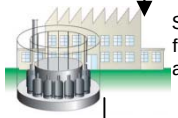
Butane tankers

Tank cars, Railway

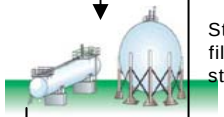
Tanker truck, Road trasnport

Pipeline

STORAGE AND FILLING. LPG are stored in reservoirs or tanks under pressure and can be used to fill cylinders and bottles.



Storage and filling of bottles and cylinders



Storage and filling of storage tanks

TRANSPORTE. LPG in cylinders and bottles is transported by open-topped trucks. LPG in bulk is transported in tanker trucks.

Open-topped trucks

Tanker truck

DISTRIBUTION. LPG in bottle is sold by first line distributors to second line distributors and directly to the end user, and LPG in bulk is sold to households, resellers of bulk gas, piped gas distributors, industry and services.

First line and second line distributors

Distributors of gas in bulk

Distributors of piped gas

END USERS. LPG in bottle, in bulk is piped and consumed by households, industry and services.

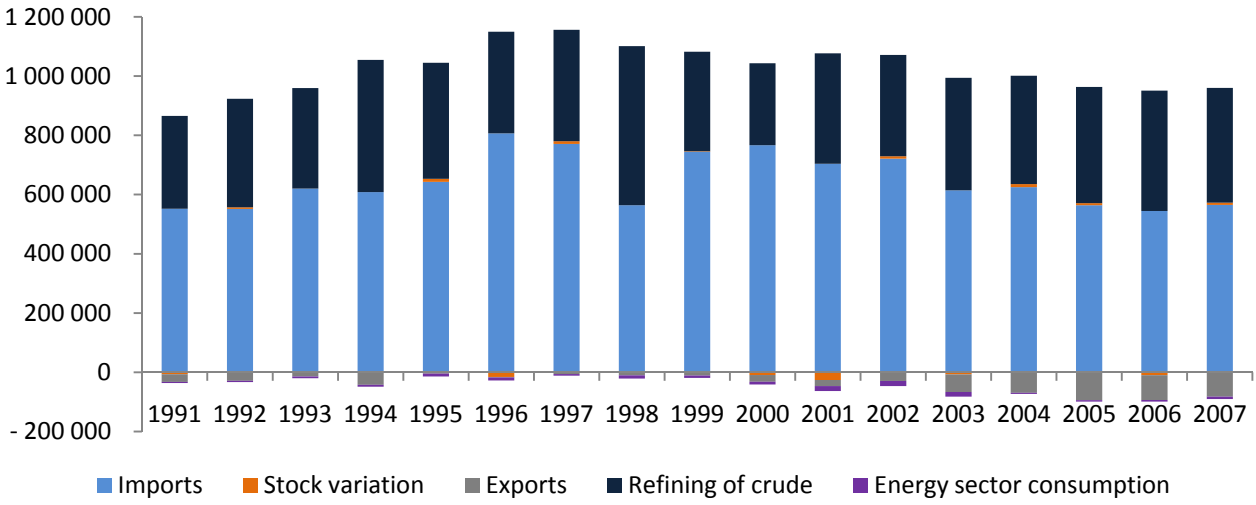
13.3.1. Production and imports

1618. Butane (C4H10) and propane (C3H8) are two of the liquified petroleum gases that can be obtained either from refining oil or as natural gas. They are gases in their natural state, but in closed recipients at ambient temperature they are liquid in form.

1619. These gases are extacted during the refining process or from natural gas deposits, and are then compressed until they take liquid form. Following this, they are stored, normally in annexes on refinery premises or at port terminals.

1620. Butane and propane are produced in Portugal in the Sines and Matosinhos refineries. Galp, BP, Esso, Repsol and ACG purchase butane and propane on the market in one of the three forms (in bottle, in bulk and piped). The energy balance shows that on average around two-thirds of the LPG available for consumption in Portugal is imported. This being so, the remaining one-third is produced from the refining process.

Chart 111 – Breakdown of LPG available for final consumption from 1991 to 2007 (in tons)

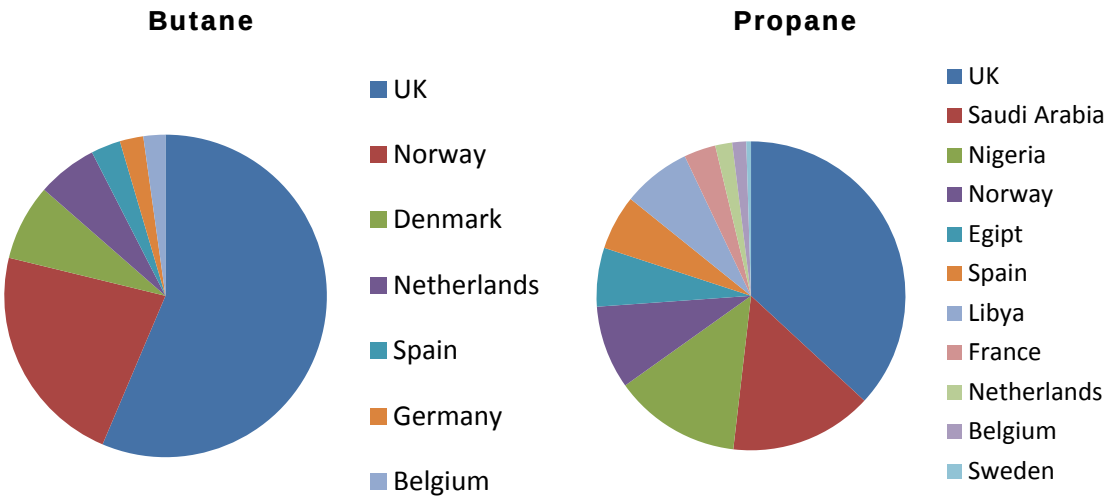


Conversion factors: 1991-2006 - 2007 1 ton = 1.13 tep; 1 ton = 1.0987 tep.

Source: Balanços Energéticos, DGEG.

1621. Around 80% of the total imports of LPG are of propane. The main countries where the imports came from in 2008 were the United Kingdom, Saudi Arabia and Nigeria. Together they accounted for around 65% of total imports. Most of the imports of butane came from the United Kingdom and Norway (with around 73%). Imports of LPG from Spain accounted for approximately 7% of the total.

Chart 112 – Origin of butane and propane imports into Portugal in 2008



Source: Portuguese Competition Authority analysis based on data from Galp, BP, Esso, Repsol and ACG.

1622. LPG is imported either by sea on special ships that can dock and offload in the ports, or overland in tanker trucks. These include the imports from Spain, through the refineries of La Coruña and Huelva.

1623. Portugal has its own technial specifications for LPG, so commercial butane and propane stored in Spain have to be separated and specially prepared for distribution in Portugal.

1624. Imports of butane and propane are normally with term or spot contracts.

1625. Term contracts are on average for six months, with the possibility of an extension for the same period of time, and there is a stipulation of specific loads per month, while spot contracts are negotiated load by load whenever the need to purchase arises.

1626. The following items fundamentally make up the import contracts: *(i)* designation of the vendor; *(ii)* designation of the purchaser; *(iii)* period that the contract is in force; *(iv)* product and quality; *(v)* origin; *(vi)* port of delivery; *(vii)* price; *(viii)* delivery terms; *(ix)* form of payment; *(x)* weight; *(xi)* designation of the ship; *(xii)* designation of the load; *(xiii)* waiting costs in the port; *(xiv)* risks/ownership.

1627. In order to reach a price for the contract, the market used as a reference for Portugal is *Northwest Europe* (NWE). The prices in contracts signed with international suppliers are based on formulas indexed to the average quotations for propane and butane, using the prices published daily by Platt's and Argus. The first of these is used for coasters (ships of small tonnage) and the second for cargoes (VLGCs, large ships[222]). The quotations that are used are the equivalent of the weekly average on the date when embarcation is logged (on the bill of lading), to which is added a spread relating to transport. The current figure is between US$81.5/ton and US$116.5/ton.

1628. Purchases can be made on the spot market, and these come fundamentally from Western Africa and the Far East.

1629. Butane and propane can also be purchased from the Portuguese refinery run by Galp, with surpluses from the domestic refinery loaded at Sines, the CLC complex in Aveiras or Perafita (Matosinhos) directly onto tankers trucks, for which the purchasers are responsible.

13.3.2. Primary transport

1630. LPG can be transported to the storage and filling facilities by special pipelines for liquid fuel or by special rail transport or tankers trucks.

1631. The use of primary transport is normally one of the contract terms for the purchase of LPG, except for transport by pipeline to the CLC complex in Aveiras and by tankers trucks for transfer of the product between terminals. In these cases, freight is contracted on a one-off basis.

13.3.3. Storage and filling

1632. LPG can be stored in reservoirs under pressure, refrigerated or semi-refrigerated tanks or in underground storage units.

1633. Tests are made on the LPG under laboratory conditions to ensure that the product meets the required technical specifications, and an odorising agent (ethanethiol) is added to ensure that the product can be detected in the case of a leak. The LPG is stored in tanks under pressure, and from here it is piped to the commercial filling equipment[223] and to the tankers trucks for bulk or piped delivery.

[222] VLGC: *Very Large Gas Carrier*.

[223] The official specifications for commercial LPG are defined in Executive order no. 348/96, of 8 August.

1634. As well as the filling process, there are other procedures: verification and segregation, checking for leaks, dates for recycling the recipients, labelling and weighing.

1635. A number of terminals have the capacity for bulk filling of LPG in tankers trucks and have facilities for automatic filling of LPG. In the Sigás[224] storage facilities, the product is stored in underground caves.

1636. There are a number of places for the storage of butane and propane and for filling the tankers trucks with LPG and filling butane and propane bottles: the Sines and Matosinhos refineries (GALP), the storage and filling facilities in Matosinhos (Repsol and BP), the Banática facilities (Repsol), CLC in Aveiras (Galp, BP and Repsol), the Perafita complex (Galp), the Sigás storage centre, (ACE Petrogal, BP and Repsol Polímeros), the storage and filling facilities in Faro (BP), the storage and filling centre at Banática (Repsol) and the terminal at Trafaria (Esso).

1637. Using information supplied by market operators, it is estimate that the useful storage capacity of imported LPG (that is, the total capacity less unrecoverable residue) is approximately 90,950 tons for butane and 125,600 tons for propane. In terms of distribution of storage capacity between the companies, Galp holds between 60% and 70%, BP between 20% and 25%, Repsol between 10% and 15% and Esso between 0% and 5%.

13.3.4. Secondary transport

1638. The LPG in bottles is transported from the storage and filling facilities to the secondary storage facilities of the first line distributors, normally in pick-up trucks. Bulk LPG is delivered from the reservoirs to customers or their wholesalers/distributors, transported in tanker trucks. Secondary transport may be carried out by the vendor's own fleet or it may be subcontracted to hauliers.[225] There are also "own-carriers" who load directly at the supplier's storage facilities or at their own storage units.

1639. Normally the cost of secondary transport between the supply point and the distributor's storage units is covered by the suppliers and downstream the cost is factored into the price charged to the cutomer.

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[224] Sigás – Armazenagem de Gás ACE is a company owned by Petrogal – Petróleos de Portugal, S.A., BP Portugal, S.A. and Repsol Polímeros, S.A. and it provides storage for LPG in Sines.

[225] Some of the companies that supply transport services are: Transporte Amaral & Frias, Lda, Transportes Rodoviários J. Barroso, Lda, Esporgás, Lda, Camionagem Central de Cheleiros, Lda, Transportes Rodoviários Monte da Caparica, Lda, Transportes Paulo Duarte, Lda and Transportes Rodoviários de Mercadorias da Agueira, Lda.

1640. When the LPG is sold bottled, the bottles are delivered to the wholesalers' storage facilities on pallets. These facilities are normlly owned by the wholesalers themslves. When the LPG is sold in bulk, the product is delivered in reservoirs, which may be owned by the supplier or the client.

13.3.5. Secondary storage

The bottles of LPG are stacked in bottle racks, either in containers that are suitable for this purpose or in the wholesalers' storage facilities. The bottles can be stacked in containers that take 35 bottles (in the case of 12 kgs, 13 kgs and 11 kgs bottles) or containers that take 11 bottles (45 kg bottles).

1641. In the facilities of the clients who buy bulk, the product is stored in surafce leel or underground reservoirs with variable capacity (for example 2.4m^3, 2.48m^3, 4.3m^3, 4.48m^3, 7,48m^3, 11.1m^3, 22.2m^3 or 50m^3).

13.3.6. Distribution of gas in bulk

1642. The LPG is sold from the storage and filling facilities to clients who buy in bulk, and they may be: *(i)* domestic consumers; *(ii)* companies in the agriculture, industry, trade, and services sectors and public bodies; *(iii)* wholesalers who deal in bulk sales; and *(iv)* distributors of piped gas through a collective network.

1643. Indeed, the sales channels for bottled and bulk LPG are very different. Market operators generally sell bottled LPG to exclusive concessionaires who they sell to small scale retailers.

1644. LPG in bulk is sold directly by the operators, and they invoice the end user direct. For this, they need a specific sales organisation. In addition, the contratual terms for LPG in bulk are generally more complex (fundamentally because of the building and maintenance of the tanks).

13.3.7. First line distribution of botled gas

1645. Butane and propane in bottle is sold through a network of first line distributors, who set the prices of the product on the basis of purchase prices and the specific situations in the area where they sell. The wholesalers are supplied by the oil companies as per the orders they put in and are bound by contracts that provide for technical and commercial support, equipment on a no-charge basis (especially the bottles themselves), measuring and illustrational equipment (for example display units for their point of sale, connectors, rubber tubing and clips). The contract also in many cases includes management software that is specific for sales of bottled LPG. In terms of the four companies - Galp, Esso, Repsol and BP – they have around 1,000 first line distributors in Portugal. These

four companies do not sell the product direct to the end user; they all have their own sales network.

1646. The contractual relationships between the suppliers and the first line distributors are governed by supply contracts. In general, these contracts contain the following terms: *(i)* they are exclusive, with demarcation of specific geographical areas; *(ii)* the first line distributors can use their own network of second line distributors; *(iii)* the bottles of LPG, the pallets for transport and display and advertisisng material belong to the supplier; *(iv)* the products are normally delivered to the warehouse of the first line distributors, and these must have licenced premises in accordance with the standards in force and *(v)* the offloading of the bottles of butane and propane is to the account and at the responsibility of the first line distributors.

1647. The first line distributors sell the product *(i)* to the second line distributors (and these may be small-scale trade - mini-markets, grocery stores, shops that sell domestic appliances, cafés, service stations and so on) or *(ii)* direct to the end user in various segments such as the domestic, cafés and restaurants, the hotel trade, industry, and others. Terciary transport of LPG from the warehouse of the first line distributor is in the hands of the wholesalers.

13.3.8. Second line distribution of botled gas

1648. Second line distributors or points of sale make up the distribution network backing the first line distributors and they are currently the main channel for sales of bottled LPG. This channel is fundamentally made up of small-scale local trade and by service stations. They provide the necessary cover across the country, including areas that are less densely populated or more isolated geographically. These points of sale are never exclusively for the sale of LPG ready for sale and there are sometimes various brands available.

13.3.9. Suppliers of LPG

1649. In mainland Portugal the following companies are involved in the business *(i)* in the segment of LPG in bottles, Galp, BP, Esso and Repsol, *(ii)* in the segment of LPG in bulk, Galp, BP, Cepsa, Repsol, Esso and Digal *(iii)* in the segment of LPG canalizado Galp, Repsol, Esso, BP, Gascan, Digal and others.

1650. The market for LPG in mainland Portugal is highly concentrated:[226]

[226] Some EU countries have more concentration that Portugal [Bello, A. and Huerta, E. (2007). "Regulation and market power in the Spanish liquefied petroleum gas industry: Progress or failure?" Energy Policy. 35: 3595-3605], such as Spain (6.719), Ireland (4.921), the United Kingdom (4.852) and other countries have less concentration, such as France (2.200) and Italy (2.800).

a) The market share of the two biggest competitors varied between 69% (2004) and 72% (1998-2001 and 2005-2008) for bottled LPG, between 69% sales (2008) and 83% (2003) for bulk sales and between 54% (2005 and 2006) and 90% (1998) in the piped segment;

b) The CR2[227] indicator is quite stable, as is the IHH indicator in the bottled gas segment.

Table 70 – Indicators of concentration in the market for LPG broken down by methods of delivery from 1998 to 2008

LPG	Indicator	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Bottles	CR2	72%	72%	72%	72%	71%	71%	69%	72%	72%	72%	72%
	IHH	3.006	3.010	3.059	3.013	2.944	2.940	2.756	3.000	3.024	3.143	3.152
Bulk	CR2	81%	78%	78%	76%	82%	83%	73%	74%	78%	71%	69%
	IHH	3.534	3.354	3.374	3.306	3.633	3.717	3.005	3.289	3.883	3.161	2.998
Pipd	CR2	90%	89%	77%	83%	80%	80%	80%	54%	54%	55%	64%
	IHH	4.751	4.661	3.638	4.426	3.872	3.647	4.138	3.983	3.986	4.032	4.612

Source: DGEG.

13.4. Regulations governing LPG in Portugal

1651. This section gives a summary of the legislation and regulations which must be complied with in the sales of commercially prepared butane and propane. This covers issues relating to: *(i)* product specification; *(ii)* prices; *(iii)* tax regime; and *(iv)* storage and distribution.

13.4.1. Characteristics of the product

1652. The technical specifications, including the physical and chemical characteristics of liquid petroleum gases, are defined in Decree Law no. 89/2008, of 30 May.[228]

1653. In Spain, the physical and chemical characteristics are defined in Royal Decree 61/2006, of 31 January. There are some technical differences between the two bills. The Portuguese is more demanding: it defines specific features that are not

[227] The CR2 indicator is the sum of the two biggest market shares.

[228] Up to 30 May 2008 the relvant document was Executive order no. 348/96, of 8 August.

in the Spanish legislation, and it also sets out more stringent demands for some of the characteristics of the gases. One of the most striking differences is in the chemical composition that is admissable for butane and for propane.

1654. In France, the specifications for LPG can be found in norms NF M40-001 and NF M40-002. Unlike Portuguese legislation (which defines the physical and chemical characteristics), the French norms only define the physical characteristics of the products (in terms of chemical characteristics, the French norms only define the maximum amount of sulphur that is allowed). In spite of this difference in approach, the Portuguese and French specifications are not very different.

1655. The physical and chemical characteristics of LPG affect the regulations governing the form of packaging in which they are sold. For example, greater rigour in the Portuguese and French specifications means that 13 kg of commercially prepared butane can be safely placed in 26-litre packaging, while in Spain, with the existing specification, it is not possible to put more than 12.5 kg in the same 26-litre packaging and keep the same degree of safety.

Table 71 – Specifications covering LPG in Portugal, Spain and France

Composition	Unit	Butane			Propane		
		Portugal	Spain	France	Portugal	Spain	France
c2	%molar	-	2 max.		5 max.	2.5 max.	
c3	%molar	15 max.	20 max.	19 max	92 min.	80 min.	90 min
c4	%molar	85 min.	80 min.		5 max.	20 max.	
c5	%molar	3 max.	1.5 max.		0.1 max.	1.5 max.	
Total unsaturates	%molar	25 max.	20 max.		25 max.	35 max.	
Dienes (as 1,3-Butadiene)	%molar	0.5 max.			0.5 max.	0.5 max.	
Residue from evaporation	%V/V)	0.05 max			0.05 max		
Vapour tension at 37.8º C	kg/cm^2					min. 10 max. 16	
Vapour tension at 40°C	kPa	520 max.			1550 max.		
Hydrogen sulfide	-	Passes the test	Passes the test		Passes the test	Passes the test	
Sulphur mercaptans	ppm	6 min.			6 min.		
Total sulphur	mg/kg	50 max.		teste NFM 41-005	50 max.	50 max.	
Corrosion of a copper blade (1h a 40°C)	-	1	1b	1b Max	1	1b	1b max
Ammoniac	ppm	1 max.			1 max.		
Water separated or in suspension	-	exempt		exempt	exempt		test NF M 41-004
Water dissolved	-	Passes the test	Passes the test		Passes the test	Passes the test	Passes the test

13.4.2. Prices

1656. The first paragraph of Executive order no. 782-B/90 of 1 September focuses on the "liberalising character" for pricing in the Government's energy policy. It states that "*prices for liquid petroleum gas sold in bottles of more than 3 Kg, in bulk and piped […] are henceforth, from midnight on 3 September 1990, no longer subject to price controls.*"

1657. The same goes for the Preamble to Executive order no. 1310/93 of 29 December, "*government moves to increase liberalisation in a number of sectors, among them liquefied petroleum gas, does not forego intervention on occasions when it would seem that market competition is not working". "In the light of this, in a transitional phase, until market conditions settle",* in the words of article 1 of the same order *"prices for LPG sold in 11 Kg and 13 Kg bottles will not have a liberalised price structure for production, import or sales".*

1658. Regulatory Dispatch no. 144/94 of 23 February states (paragraph 1): "*under the terms of paragraph 2 of Executive order no. 650/81, of 29 July*" (…) "*the following products are subject to price controls,*[229] *at production/import and sales levels, as found in the Classification of Economic Activities (CAE, revised 1993): ex 23200 – Liquified petroleum gases in 11 Kg and 13 Kg bottles*". The General Directorate for Economic Activities (hereafter designated DGAE)[230] now receives the information sent by those companies that are notified as per the provisions of the above-mentioned dispatch.

1659. The prices of LPG in bottles are controlled in everal European countries, among them Spain, Belgium and Luxembourg.

13.4.3. Fiscal framework

13.4.4. Applicable taxes

1660. Sales of LPG in Portugal are subject to two types of tax: ISP and VAT. Retail prices of butane and propane included VAT at 19% up to 30 of June 2005, 21% up to 30 July 2008 and 20% from 1 July 2008. The figure for ISP is defined in €/kg,

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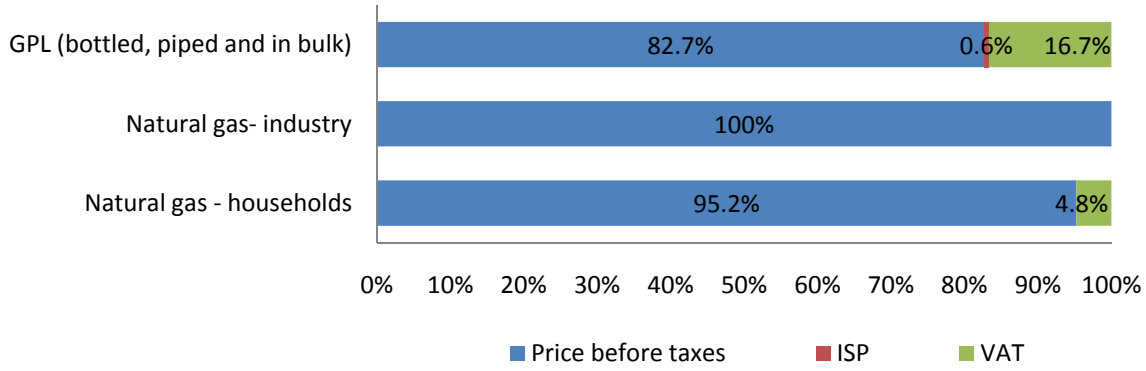
[229] In the words of paragraph 3 of Executive order no. 650/71 "*the regime for monitored prices means that companies are notified to the effect and must send the following information (recorded delivery) to the General Directorate for Foodstuff and the General Directorate for Non-Foodstuff (depending on the nature of the products): a) the prices charged and the margins for sale on the date of notification; b) changes in prices and margins whenever they occur, and the date they came into force; c) any other information or clarification requested by the above-mentioned General Directorates; d) in those cases mentioned in point b) above, the changes leading to the new prices must be duly justified*".

[230] *Cf.* http://www.dgae.min-economia.pt/.

and was 0.00748 up to 31 of December 2005, 0.00765 in 2006 and 0.00781 from 2007, following government budget provisions.

1661. Natural gas can provide an alternative to LPG when there is a network in a given region (even though there are costs involved in changing). Given this, the tax situation for each of the products will be analysed. In the case of natural gas, VAT is levied at 5%[231] though only in the domestic sector. This means that the tax burden for LPG is around 17.3% of the retail price, whereas in the case of natural gas it is only 4.8%.

Chart 113 – How prices for natural gas and LPG are reached



Source: DGEG.

1662. As for other energy products with a similar capacity to produce thermal energy for use in either the domestic sector (kitchens, ambient temperatures and water for washing) or in the industrial, agricultural or service sector (production of thermal energy), there is a tax regime that gives electricity a benefit which is more favourable than for LPG (5%). For diesel used in heating, the VAT rate is 12%.

13.4.5. The VAT rate applied to LPG

1663. The VAT on transmission of gas as fuel is different from the rate on liquid fuel – as per articles 69 and 75 of the VAT code (in the wording given by Decree Law no. 102/2008, of 20 June).

1664. In the words of paragraph 1 of article 32 of Law no. 9/86, of 3 April, relating to the settlement of VAT on the transmission of gas as fuel, "[in] *any transmission of gas as fuel, which includes bottled gas, the tax will be settled by the distributors: a) based on the retail price fixed by the public authorities in the*

[231] Portugal's request to apply a lower rate of VAT (5%) on supplies of natural gas was approved by the Commision (Decision 2003/633/CE, publisheed in JO L 220, of 3 Setember 2003).

case of wholesalers; b) based on the actual price when sales are direct to the consumer."

1665. It follows that VAT in the transmission of LPG should be paid by the distributors on the basis of the retail price in total and in one amount, even when sales are through wholesalers.

1666. As expressed in paragraph 2 of Dispatch no. 119547, of 10 Setember 1990, by the secretary of state for fiscal affairs, "[*the*] *publication* (…) *of Executive order no. 782-B/90, of 1 Setember, which placed LPG under a non-controlled price regime, from 0 hours 3 September 1990, created difficulties for the special regime for settling VAT, and it is necessary to take measures that allow the tax to be levied until the special regime set out in paragraph 32 of Law no. 9/86, of 30 April has been revoked.*"

1667. In paragraph 3 of the same Dispatch, it was stipulated that "*up to the point where the amendment mentioned in the previous paragraph is enacted, the distributors, in the case of delivery to wholesalers, must continue to settle the whole amount of the VAT due on transmission of gas as a fuel based on the value resulting from application to the sales price of the factor deriving from the division of the price for retail sales fixed administratively on 31.08.90 (with inclusion of the rate for home delivery), by the sales price used by the distributor on the same date, in relation to each fuel and/or form of delivery, plus 8%, viz:*

$$VT = VV_2 \times \frac{VVP_1 + TD}{VV_1 + 1{,}08},$$

where:

VT – Taxable amount

VVP1 – Value of retail sale as at 31.08.90 [with VAT included]

TD – Rate for home delivery as at 31.08.90 [with VAT included]

VV1 – Value of retail sale by the distributor as at 31.08.90

VV2 - Value of retail sale by the distributor at settlement date [without VAT included]

VAT due – VT x 8% [Rate of VAT as at 31.08.09 = 8%]".

1668. It is difficult to understand the provisions of clause a) of paragraph no. 1 of article 32 of Law no. 9/86, of 3 April, following the publication of Executive order no. 782-B/90 of 1 September, which introduced a free price regime fro LPG from

September 1990, since the first pressuposes the existence of a regime of fixed prices.

1669. Following Dispatch no. 119547, of 10 September 1990, issued by the secretary of state for fiscal affairs, unlike what happens in the standard regime of VAT or even in the regime for liquid fuel, it is the responsibility of the company that places the product on the market to make a single payment of VAT on the price of sale to the end user, whether or not the sale is actually made to this particular end user.

1670. The distributor should (under terms of article 8 of the VAT code) settle the tax when the invoice is issued.[232] In other words, VAT becomes due as soon as the distributor issues the invoice, even if the product is only sold to the end user at a later time.

1671. It follows from this that a sales margin has to be estimated for the network of first line distributors downstream from the second line distributor and this is added to the price on which VAT is levied, so this means the tax may be more than 20%. It is the distributors that have to collect and pay VAT to the state, including the differential resulting from the amount on the estimated margin.

13.4.6. Storage and Distribution

1672. Centres for the storage of LPG are subject to licensing, and this covers construction, maintenance, safety and inspections as detailed in the stipulations below:

- Decree Law no. 124/97, of 23 May – sets out the stipulations relating to approval of the safety regulations for the storage facilities of LPG with capacity of up to 200 m^3 per recipient and regulations relating to the construction and maintenance of bottle storage parks for LPG, along with the instalation of high powered gas apparatus;
- Executive order no. 451/2001, of 5 May – approves regulations on safety relating to the construction, operating and maintenance of LPG bottle storage parks;
- Executive order no. 460/2001, of 8 May - approves regulations on safety of storage facilities for LPG with capacity up to 200 m^3 per recipient;
- Decree Law no. 389/2007, of 30 November – amends Decree Law no. 267/2002 and Decree Law no. 125/97 and revokes Decree Law no. 198/70

[232] By remission of article 2 of Decree Law no. 521/85, of 31 December. This is still applicable to gas as fuel, with the necessary adaptations, even though it has been revoked for liquid fuel under the provisions of clause no. 2 of article 32 of Law no. 9/86, of 3 April.

of 9 May, relating to storage capacity subject to licensing and also article 72 of Decree 29 034, of 1st October 1938;

- Executive order no. 1515/2007, of 30 November – amends Executive order no. 1188/2003, governing requests for licencing;
- Decree Law no. 31/2008, of 25 February – sets out the procedures and defines the responsibliites for licensing and inspection of the storage facilities for oil-based products and facilities on service stations;

1673. Operations connected with or relating to the business of bottled gas fall under the provisions of the following diplomas:

1674. Decree Law no. 170-A/2007, of 4 May, with the wording given in Decree Law no. 63-A/2008 contains stipulations relating to:

- Design, production, marking and testing of bottles of gas (chapter 6.2., which includes all applicable European norms, among others, EN 1442: 1998/A2: 2005);
- Labelling of bottles (subsection 5.2.2.2.);
- Rates of filling and regulations governing filling (subsection 4.1.4.1.);
- Periodical inspections (subsection 4.1.4.1.);
- Special stipulations on labelling (subsection 4.1.4.1.);
- Construction and approval of vehicles used for transporting bottles of gas (subsection 9.1.2.);
- Signage on vehicles (subsection 5.3.2.);
- Training and other stipulations to be fulfilled for the crews of vehicles used for transporting bottles of gas (subsections 1.3.2.1., 1.3.2.2. and 1.3.2.3., subsections 1.3.3., 8.2.1. and 8.2.2. and sections 8.3 and 8.4.);
- Training of all staff as well as drivers (subsections 8.1.2. 8.1.3., 8.1.4. and 8.1.5.);
- Equipment and manoeuvering of vehicles (subsections 8.1.2., 8.1.3., 8.1.4. and 8.1.5.).
- Conditions relating to transport, laoding, unloading, and handling of bottles of gas (subsections 7.5.1., 7.5.2., 7.5.7, 7.5.9 and 7.5.10.);
- Documentation for transport (subsection 5.4.1.);
- Written instructions for the driver – Decree Law no. 170-A/2007, of 4 May, with the wording given in Decree Law no. 63-A/2008, subsection 5.4.3.

1675. LPG (normally in the form of commercial propane) can also be supplied to fixed tanks belonging to the client. These are supplied periodically by tanker trucks specifically designed for the transport of LPG. Operations involved in the sale of LPG in bulk come under the following legal stipulations:

- Design, production, marking and testing of equipment under pressure (gas tanks) – Decree Law no. 211/99 of 14 June, transposing into Portuguese law directive no. 97/23/CE of 29 May, European Parliament, relating to equipment under pressure;
- Registration of equipment under pressure – Decree Law no. 97/2000 of 25 May;
- Projects for installing equipment under pressure – Decree Law no. 124/97 of 23 May, Executive order no. 460/2001 of 8 May, Executive order no. 386/94 of 16 June, amended by Executive order no. 690/2001 of 10 July and Decree Law no. 125/97 of 23 May;
- Licensing for installing equipment under pressure – Decree Law no. 267/2002 of 26 November, amended by Decree Law no. 389/2007 of 30 November, Decree Law no. 31/2008 of 25 February, Decree Law no. 195/2008, of 6 October and Executive order no. 1188/2003 of 10 October, amended by Executive order no. 1515/2007, of 30 November;
- Installing equipment under pressure – Decree Law no. 97/2000, of 25 May;
- Installing equipment under pressure in points of supply of liquid petroleum gases – Executive order no. 131/2202. of 9 February, amended by Executive order no. 363, of 4 April;
- Starting up equipment under pressure – Decree Law no. 97/2000 of 25 May;
- Organisations operating stores, networks and gas distribution lines – Executive order no. 82/2001 of 8 February;
- Insurance for organisations operating stores, networks and gas distribution lines - Executive order no. 589/2005;
- Maintenance of equipment under pressure - Executive order no. 460/2001 of 8 May and Dispatch 22333 of 21 October;
- Periodical controls of the protection for underground equipment under pressure – Dispatch 22333 of 21 October 2000;
- Periodical inspections - Dispatch 22333 of 21 October 2000;
- Regulation of gas pressure gauges – Executive order no. 422/98;

– Regulation of pressure gauges for piped gas meters – Executive order no. 500/86 of 8 September;

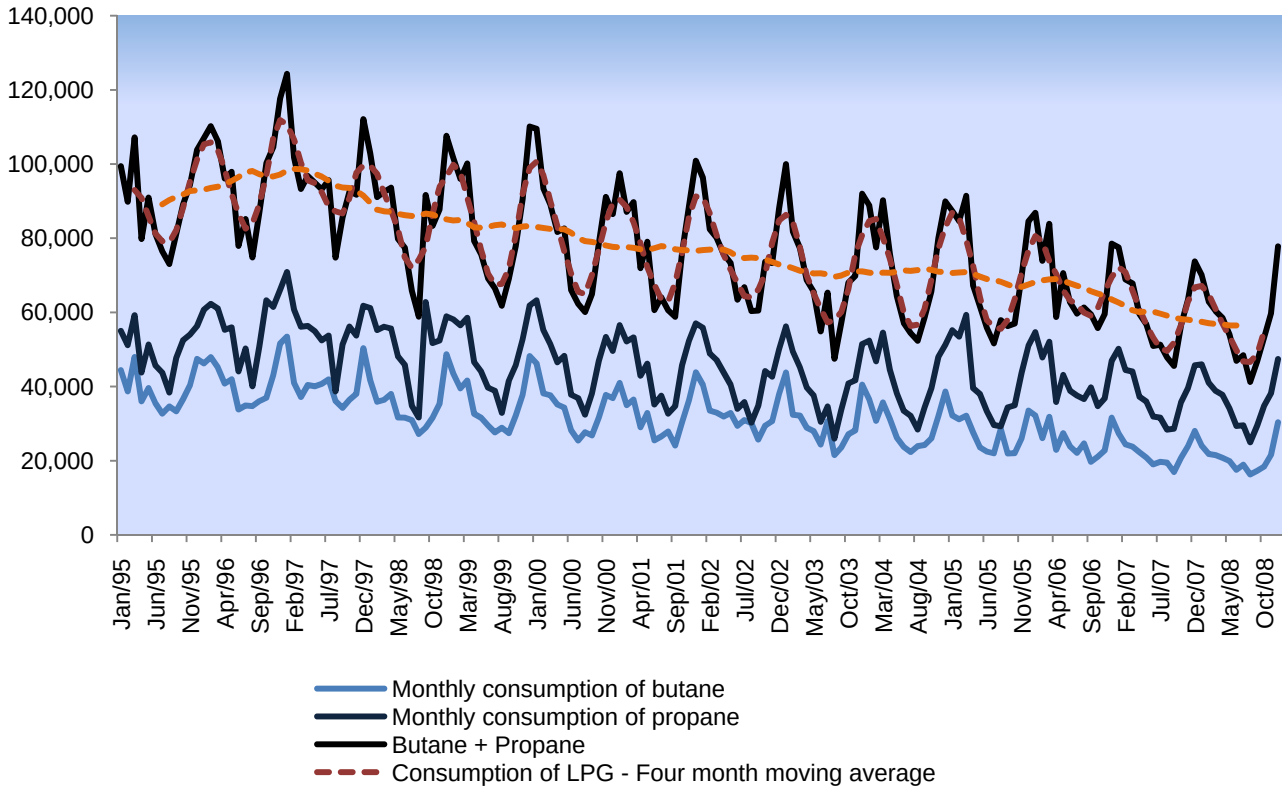
– Construction and approval of vehicles used in the transport of gas in bulk – Decree Law no. 170-A/2007, of 4 May, with the wording given by Decree Law no. 63-A/2008, subsections 6.8.2., 6.8.3. and section 6.9.

13.5. Characteristics of domestic demand for LPG

13.5.1. Moves in domestic demand for LPG

1676. The demand for LPG butane and propane recorded a falling trend from 1996, in spite of the 9% growth recorded between 1995 and 1996. In particular, in the period from 1996 to 2008, annual demand in mainland Portugal moved from 1,066,156 tons to 679,882 tons, which was a 36% drop. The consumption of butane was down by 47%, moving from 467,314 tons in 1996 to 248,525 tons in 2008, but propane was down less, at 28%, moving from 598,842 tons in 1996 to 431,358 tons in 2008.

Chart 114 – Monthly demand for propane and butane in mainland Portugal from January 1995 to December 2008, in tons

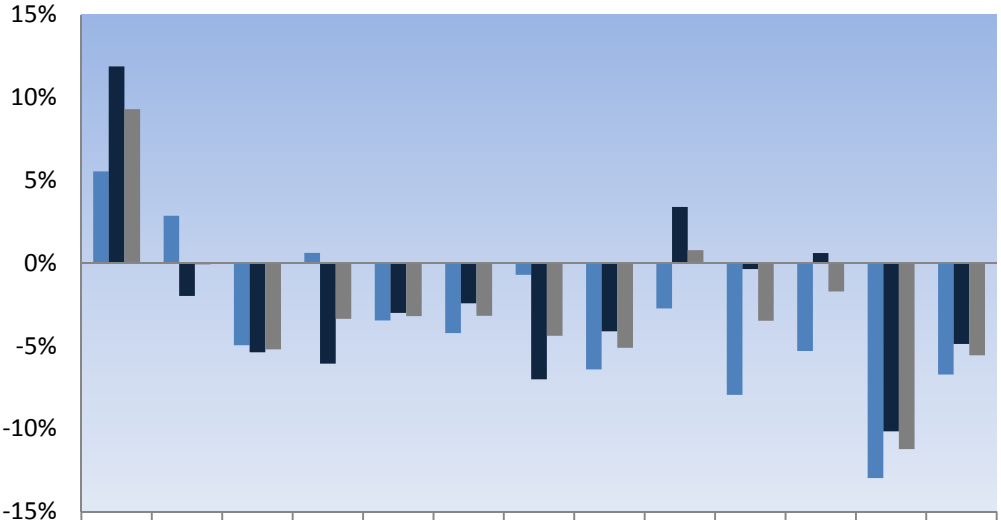


Source: DGEG

1677. The volatility of moves in the consumption of LPG can be defined in marginal terms by the standard deviation of the monthly rate of variation. Between 1995 and 2008, the standard deviation of the monthly rate of variation was 15%.

1678. The series of monthly data shows that there is a seasonal character to LPG consumption, with peaks in the winter, associated with lower temperatures and a greater need for heating. This is clear in the chart that shows the LPG consumption series and the related averages on a 4-month and a 12-month basis. There is a marked irregular component in the consumption series, along with the rising trend up to 1996 and a falling trend since then and the seasonal feature mentioned already.[233]

Chart 115 – Average annual rate of variation in demand for butane and propane from 1995 to 2008, in tons



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Butane	6%	3%	-5%	1%	-3%	-4%	-1%	-6%	-3%	-8%	-5%	-13%	-7%
Propane	12%	-2%	-5%	-6%	-3%	-2%	-7%	-4%	3%	0%	1%	-10%	-5%
Total	9%	0%	-5%	-3%	-3%	-3%	-4%	-5%	1%	-3%	-2%	-11%	-6%

Source: DGEG

13.5.2. Structure of domestic demand for LPG

1679. There was a marked rise in consumption of bottled gas from 1995 up to 1996, then a moderate rise up to 2005 and a fall from then on. Consumption of gas in

[233] The time series have four compnonents: trend, cycle, seasonality and regularities.

bulk grew between 1995 and 1996 and between 2005 and 2006, with a fall from 1996 to 2004 and then again from 2006.

1680. In the period between 1995 and 2008, the consumption of piped LPG fell by 15%, LPG in bottles by 19% and LPG in bulk by 48%.

Chart 116 – Annual demand for gas as fuel, by form of delivery from 1995 to 2008, in tons

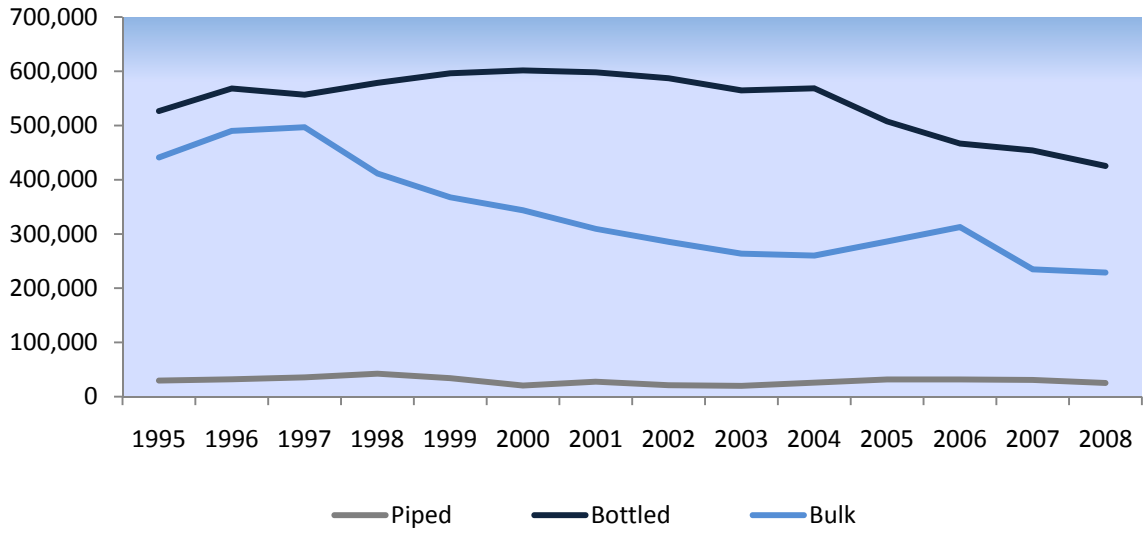
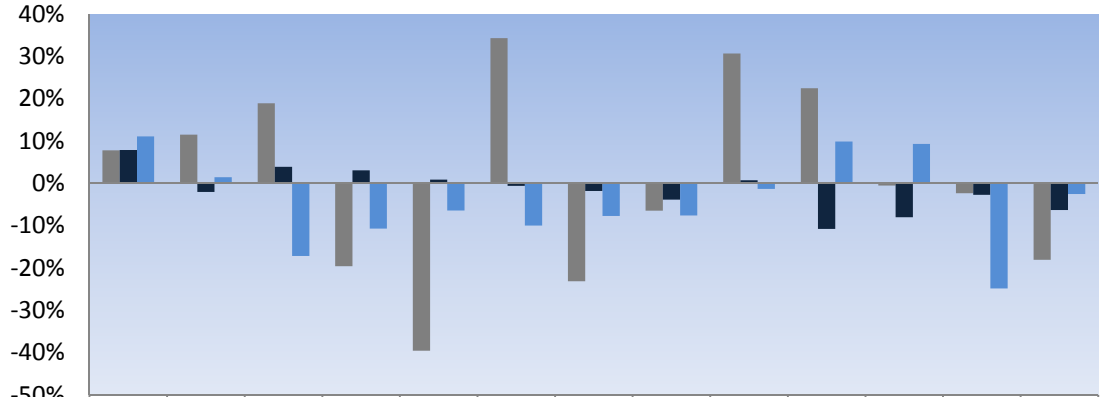


Chart 117 – Average annual rate of variation by form of delivery from 1995 to 2008



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Piped	8%	12%	19%	-20%	-40%	34%	-23%	-6%	31%	22%	-1%	-2%	-18%
Bottled	8%	-2%	4%	3%	1%	-1%	-2%	-4%	1%	-11%	-8%	-3%	-6%
Bulk	11%	1%	-17%	-11%	-6%	-10%	-8%	-8%	-1%	10%	9%	-25%	-3%

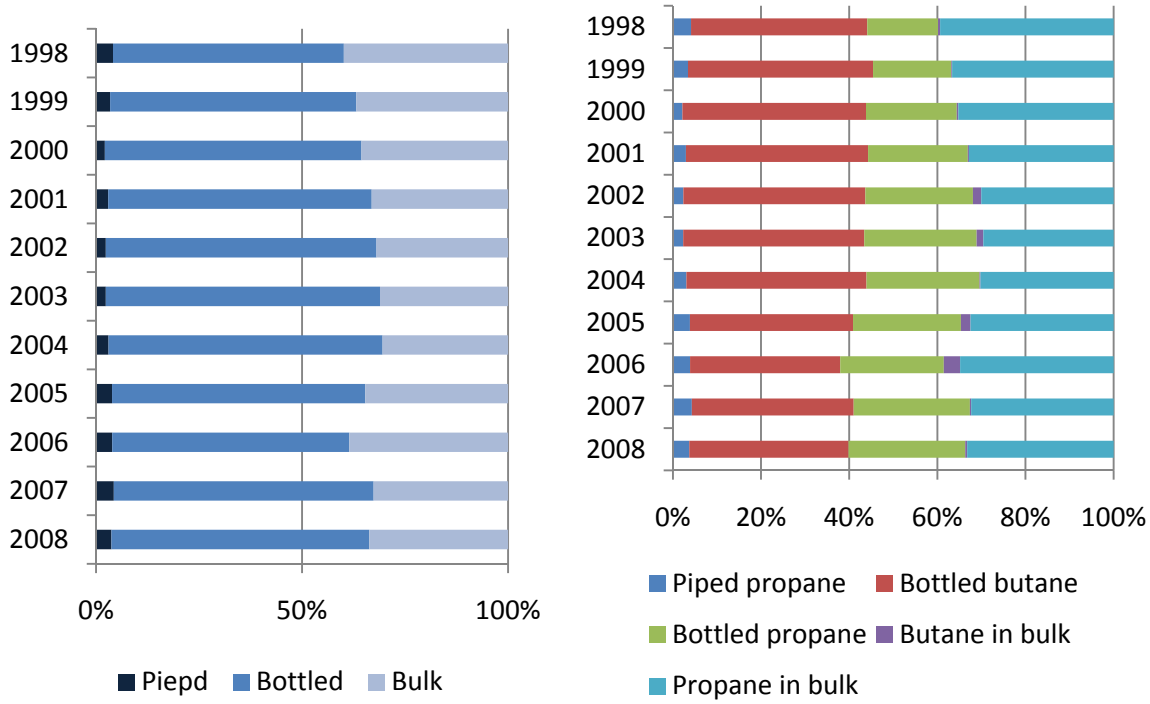
1681. Consumers of LPG in bulk are found in most economic sectors, above all agriculture, industry, trade/services and domestic. Other sectors use propane in bulk as the primary energy for their production system (with the exception of the domestic sector and some services, which use propane in bulk for their own consumption).

1682. Clients in the sector of bottled LPG are: *(i)* for a 13kg/12kg bottle of butane – small-scale food operations (take away, cafés, canteens), the domestic sector (stoves, heaters, water heaters, leisure equipment); *(ii)* 11kg bottle of propane - small scale food and beverage operations (take-aways, cafés, canteens), the domestic sector (stoves, heaters, water heaters, leisure equipment) and the industrial sector (small companies providing specialist services); *(iii)* 11kg bottle of propane with sonda - industrial sector (stackers); *(iv)* 45kg bottle of propane - domestic sector (stoves, boilers, central heating, swimming pool heating) restaurants and cafés, the hotel trade and the leisure sector (sports pavilions, swimming pool) and the industrial sector (bakeries, greenhouses, factories).

1683. In terms of composition of sales, LPG in bottles accounted for 56%, 67% and 63% of the total in 1998, 2003 and 2008 respectively. Gas sold in bulk recorded 40%, 31% and 34% in the same three years and piped gas 4%, 2% and 4%.

1684. Looking at the product and the form of delivery, we can see that bottled butane came in with 37%, 42% and 40% of the total sales of gas as fuel in 1998, 2003 and 2008 respectively with propane in bulk for the same periods coming in at 32%, 35% and 44% respectively.

Chart 118 – Composition of annual sales of gas as fuel from 1998 to 2008



1685. In terms of geographical distribution, the consumption of butane and propane is highest in the municipal districts of Lisbon, Oporto and Setúbal. In 2000 and in 2007, Lisbon accounted for 16% and 15% of the consumption of butane and 20% and 15% of propane respectively. In the same years, Oporto accounted for 14% and 16% of the consumption of butane and 14% and 12% of propane respectively.

1686. In absolute terms, the biggest drops in consumption of butane were in the districts of Leiria (51%), Aveiro and Santarém (34%), Castelo Branco (32%) and Coimbra (30%). In terms of propane, the biggest drops in consumption were in Coimbra (58%), Viana do Castelo (54%), Castelo Branco (53%), Braga (43%) and Vila Real (42%).

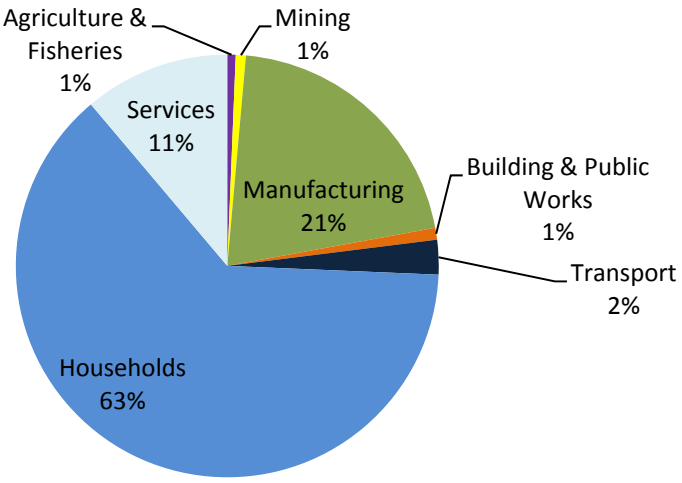
Table72 – Consumption of butane and propane by district in 2000 and 2007 and the rate of variation

District	Butane			Propane		
	2000	2007	Tx. var. 00-07	2000	2007	Tx. var. 00-07
Aveiro	10%	8%	-34%	7%	6%	-20%
Beja	1%	2%	53%	3%	2%	-32%
Braga	10%	10%	-25%	8%	5%	-43%
Bragança	1%	1%	-2%	2%	1%	-35%
Castelo Branco	2%	2%	-32%	3%	1%	-53%
Coimbra	5%	5%	-30%	5%	2%	-58%
Évora	2%	2%	-12%	3%	3%	-28%
Faro	6%	8%	14%	5%	5%	-17%
Guarda	2%	2%	-2%	2%	2%	-14%
Leiria	9%	6%	-51%	3%	2%	-34%
Lisbon	16%	15%	-24%	20%	15%	-34%
Portalegre	1%	1%	-25%	1%	1%	-39%
Porto	14%	16%	-12%	14%	12%	-23%
Santarém	7%	6%	-34%	5%	5%	-25%
Setúbal	7%	8%	-10%	9%	32%	225%
Viana do Castelo	2%	3%	-11%	3%	2%	-54%
Vila Real	2%	2%	-1%	3%	2%	-42%
Viseu	4%	4%	-24%	4%	3%	-37%
Total	100% 559,790 tons	100% 436,936tons		100% 407,290tons	100% 363,978tons	

Source: DGEG.

1687. The domestic sector accounts for around 63% of LPG. Manufacturing industries account for 21% of final consumption, salient among them being the chemical and plastics industries (12% of the total), light engineering and mechanical industries (3%) and food and beverages (3%). The service sector accounts for 11%, transport 2% and agriculture and fisheries, mining and construction and public works 1%.

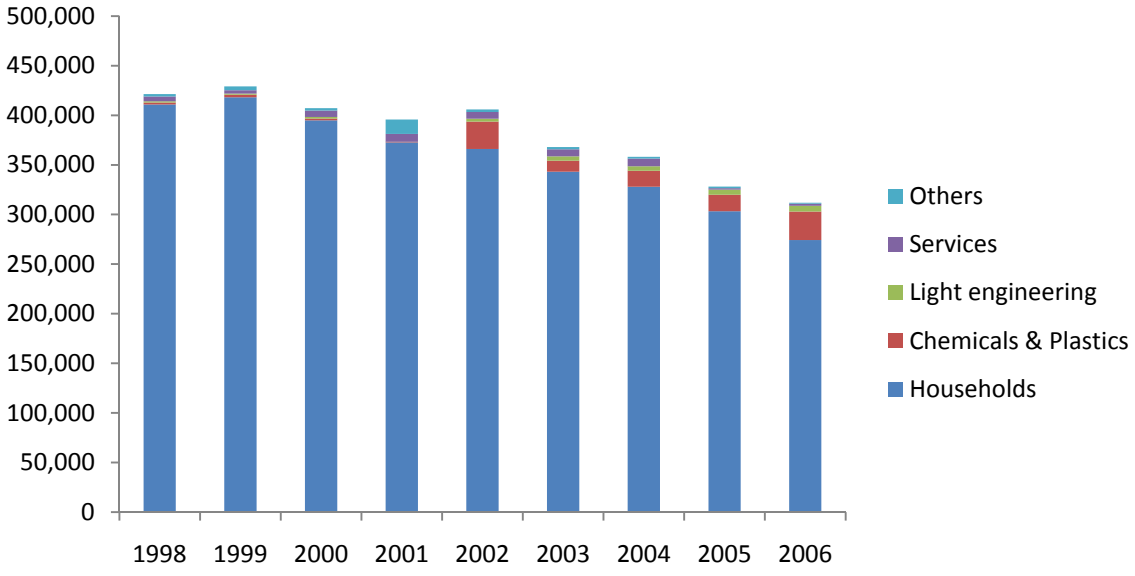
Chart 119 – Consumption of LPG per economic activity in 2007



Source: Energy Balance 2007, DGEG.

1688. Consumption is fundamentally domestic, with a maximum of 98% of total consumption of the product in 1998 and a minimum of 88% in 2006. There was a 33% drop in domestic consumption of butane between 1998 and 2006. Since 2002, the chemical and plastics industry has been second in terms of consumption, with a 10.5% proportion in 2006.

Chart 120 – Breakdown in consumption of butane from 1998 to 2006

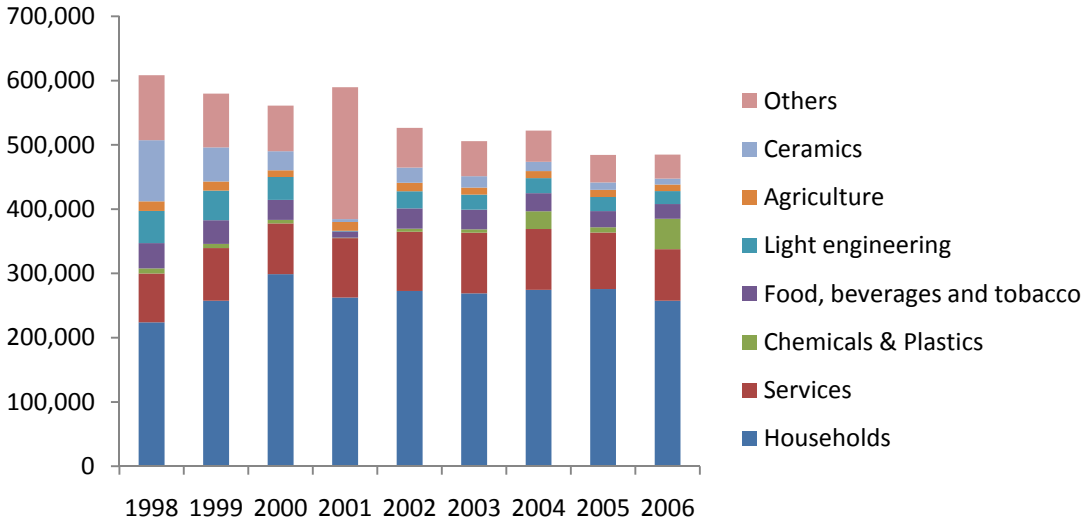


Source: DGEG

1689. The domestic segment accounted for a maximum of 57% of propane consumption in 2005 and a minimum of 37% in 1998. Domestic consumption of propane grew by 15% in the period under review. The service sector was the second biggest consumer of propane, with a maximum proportion of 19% in 2003 and a minimum of 12% in 1998.

1690. The biggest fall in the consumption of propane between 1998 and 2006 occured in the non-domestic sector, coming in 41% down.

Chart 121 – Breakdown in the consumption of propane from 1998 to 2006



Source: DGEG

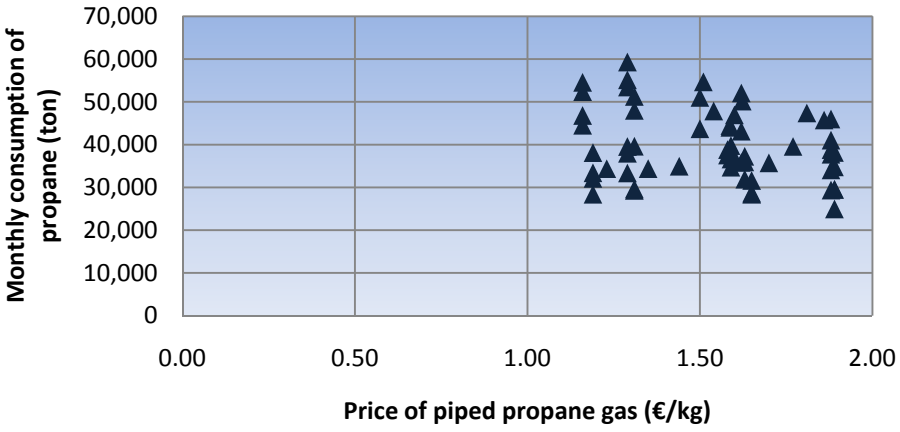
13.5.3. Factors underlying domestic demand for LPG

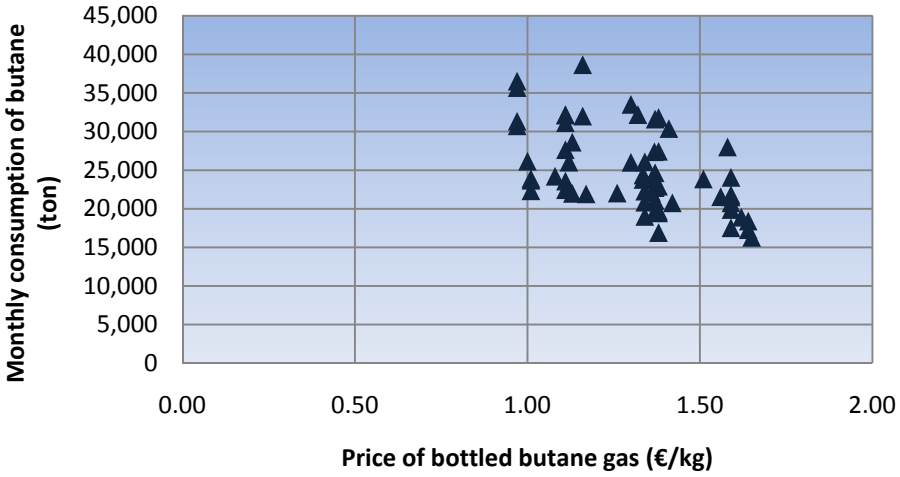
1691. The aim of this point is to identify some of the variables that could help explain the consumption of LPG. Bi-variate analyses will be made, using dispersion diagrams and analysis of the correlation between the consumption of LPG and the following variables *(i)* price of LPG, *(ii)* price of alternative products , *(iii)* indicator of the social and economic framework and *(iv)* cover provided by the natural gas network.

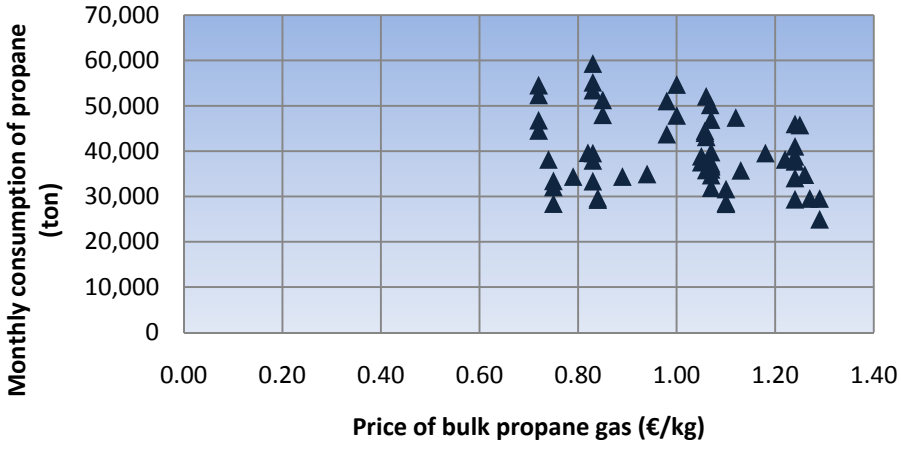
1692. An analysis of the dispersion diagrams between the monthly consumption of LPG and monthly prices between January 2004 and December 2008 shows that there is a moderate negative correlation between the consumption of butane and the price of bottled butane (r=-0.554) and a weak correlation between the

consumption of propane and the price of propane in bulk (r=-0.279) and of piped propane (r=-0.261).

Chart 122 – Dispersion diagrams of the monthly consumption of LPG and the average monthly price of LPG



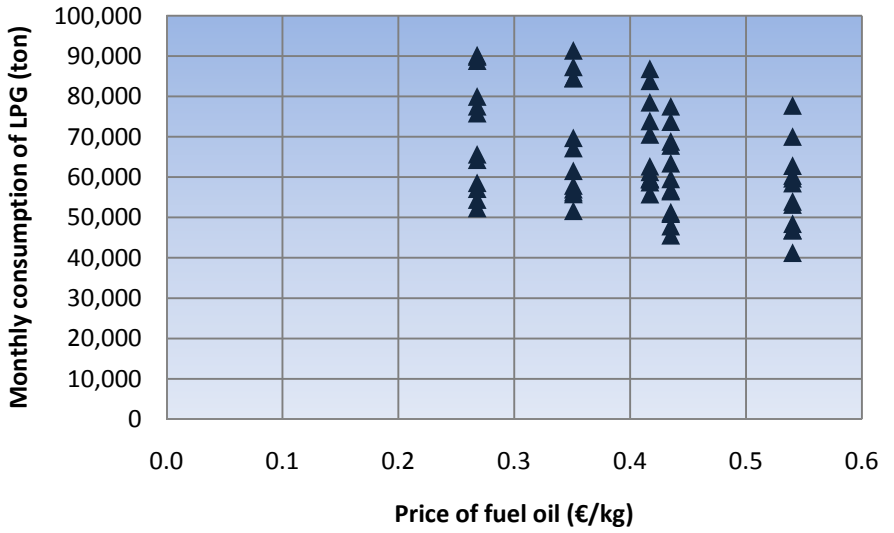


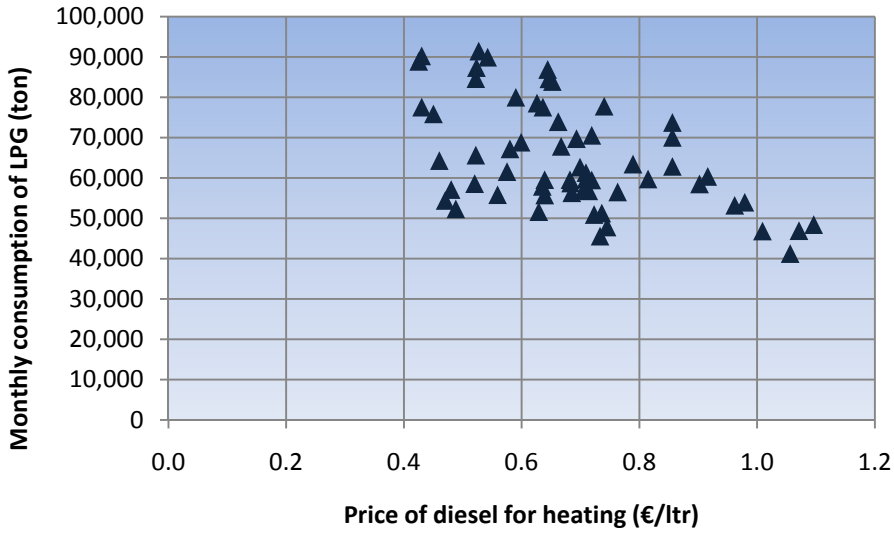


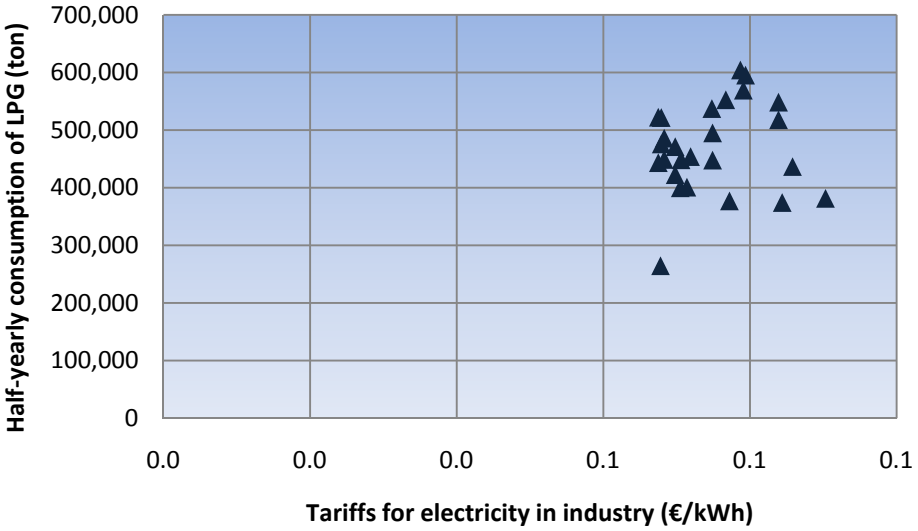
Source: DGEG.

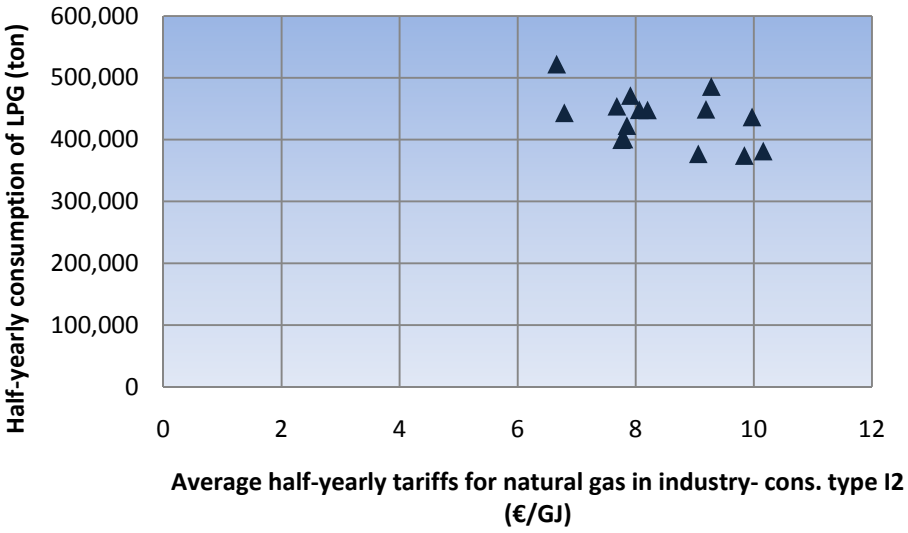
1693. An analysis of the following charts seems to show that there is no relationship between the monthly consumption of LPG and the prices of fuel oil and diesel for heating during the period between January 1995 and December 2008, and between the half-yearly consumption of LPG and the prices of electrical energy and natural gas for the period between the first half of 1995 and the second half of 2008 and the first half of 2000 and the second half of 2008, respectively.

Chart 123 – Dispersion diagrams of the consumption of LPG and the average price of alternative products





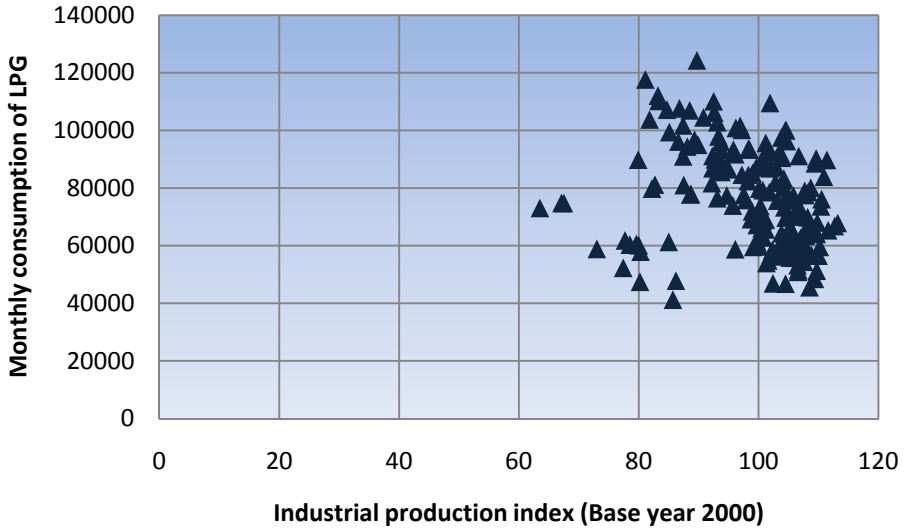




Source: DGEG.

1694. The following chart shows that there apparently exists a weak relationship between the monthly consumption of LPG and and the monthly index of industrial production (Índice de Produção Industrial) during the period between January 2005 and December 2009.

Chart 124 – Dispersion diagrams of the consumption of LPG and the monthly index of industrial production

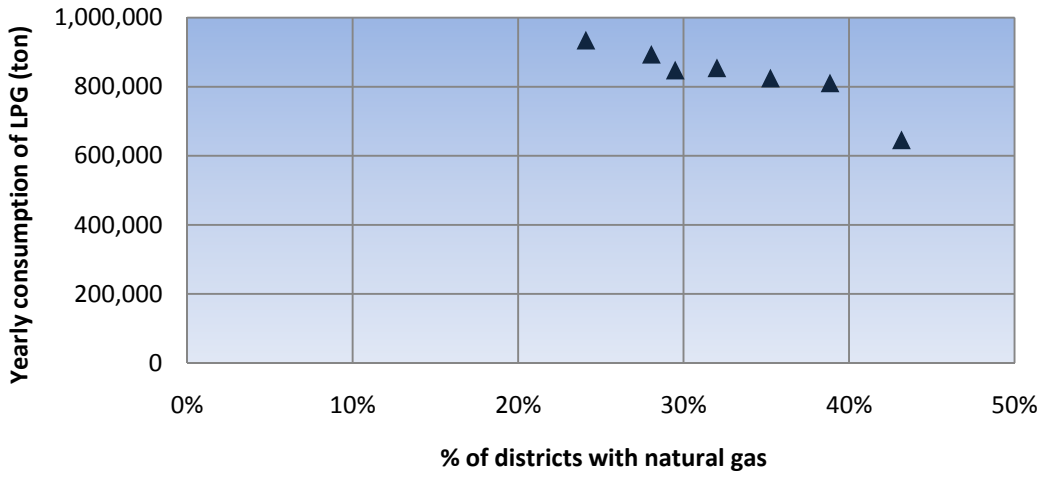


1695. The following dispersion diagram shows that there is a strong negative correlation between the annual consumption of LPG and the cover of the natural gas network[234] from 2001 to 2007, measured by the percentage of districts that

[234] The supply of natural gas in mainland Portugal is subject to a specific regime that is different from the supply of LPG in bottles. Furnishing supplies of some energy services such as natural gas implies the use of infrastructures in storage, transport and distribution. These are normally natural monopolies that imply massive investment and where it is not efficeint to foster competition by duplication of infrastructures. Since we are dealing with an emerging market (natural gas was introduced into Portugal in 1998), the entrepreneurial component was initially organised around concession contracts. In this context, Decree Law no. 274-C/93, of 4 August, set out the basis for the concession of operaions involving import, transport and distribution of natural gas in Portugal. It stipulated a ceiling to the profits that could be made by the concessionairs (since this was a monopoly) as a means of protection for customers. Indeed, if there is no open market, the State as authority awardin the concessions has the duty to protect the State *latu sensu* against any abuse of cusomers in the market concerned. Following developments in community law and decisions on domestic policies, Decree Law no. 97/2002, of 12 April, gave broader powers to the energy regulator (Entidade Reguladora dos Serviços Energéticos - ERSE) in the natural gas sector. In 2003 it was decided to partially liberalise the sector, as well as introduce changes in its entrepreneurial structure. Later, following the definition of a new national strategy for energy, Decree Law no. 30/2006, of 15 February, set down the general principles for the organisation and running of the national system of natural gas (SNGN), covering also operations in reception, storage, transport and sales. So the new organisation of the natural gas sector from then on worked with some operations that were without price controls and others that were monopolies. The parts of the business that are monopolies are regulated by the ERSE. The organisation of the national system of natural gas is based on the piblic network of natural gas, and this is made up of the national transport network, installation of storage facilities and distribution. The right to operate these infrastructures is subject to public service concessions or, in the case of autonomous local distribution networks, through public service licences. The sale of natural gas is free of price controls, although it is subject to a licence. Those involved in selling the product had access to the infrastructures, through the payment of a fee that was regulated (from 2007 by ERSE). The prices charged by distributors to end users are fixed by a licencing procedure from the ministry for the proposals put in by would-be distributors. The energy regulator publishes an annual list of tariffs and prices for natural gas to be in force from 1 July to 30 June the following year. The list for 1 July 2008 to 30 June 2009, was published in Dispatch no. 13/2008, of 12 June. The lists are reviewed on a quarterly basis, as per Dispatch no. 6/2009, of 27 March.

were served (r=-0.964[235]). The fall in consumption of LPG was accompanied by an increase in the cover provided by the network, rising from 24% of districts in 2001 to 43% in 2007.

Chart 125 – Dispersion diagram between the annual consumption of LPG and the cover provided by the natural gas network

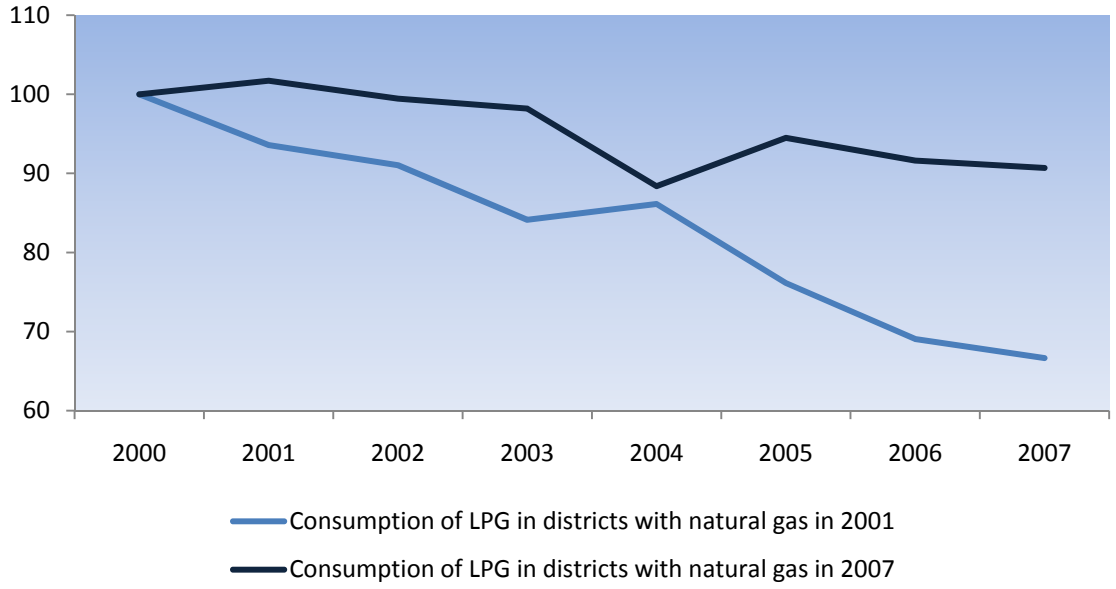


Source: DGEG.

1696. It is clear that the reduction in the consumption of LPG from 2000 to 2007 was steeper in the districts where natural gas had been installed in 2001 compared with the districts where natural gas had still not been installed in 2007.

[235] Given the small number of observations, the Spearman correlation coefficienct was used rather than the Pearson coefficient previously used.

Chart 126 – Index of LPG consumption in the districts with natural gas in 2001 and those without natural gas in 2007



Source: DGEG.

1697. The aim of the following section is to see if there was a change in the average figures for consumption of LPG after natural gas was installed. Mann-Witney[236] non-parametric tests are carried out for each of the districts where natural gas was installed in 2001 (67), 2002 (11) and 2003 (4). The null hypothesis (H_0) of equal central trend in the distribution of consumption of LPG before and after the introduction of LPG is rejected in 72% of the districts where natural gas was installed in 2001, in 64% of the districts where natural gas was installed in 2002 and in 75% of the districts where natural gas was installed in 2003.

1698. The findings are not definitive, but they show that one of the main factors explaining the reduction in demand for LPG seems to be related to the increase in cover from the natural gas network.

[236] Os valores de prova do teste foram obtidos por métodos de simulação Monte Carlo.

Table 73 – Test of the difference in LPG consumption per districy before and after the introduction of natural gas

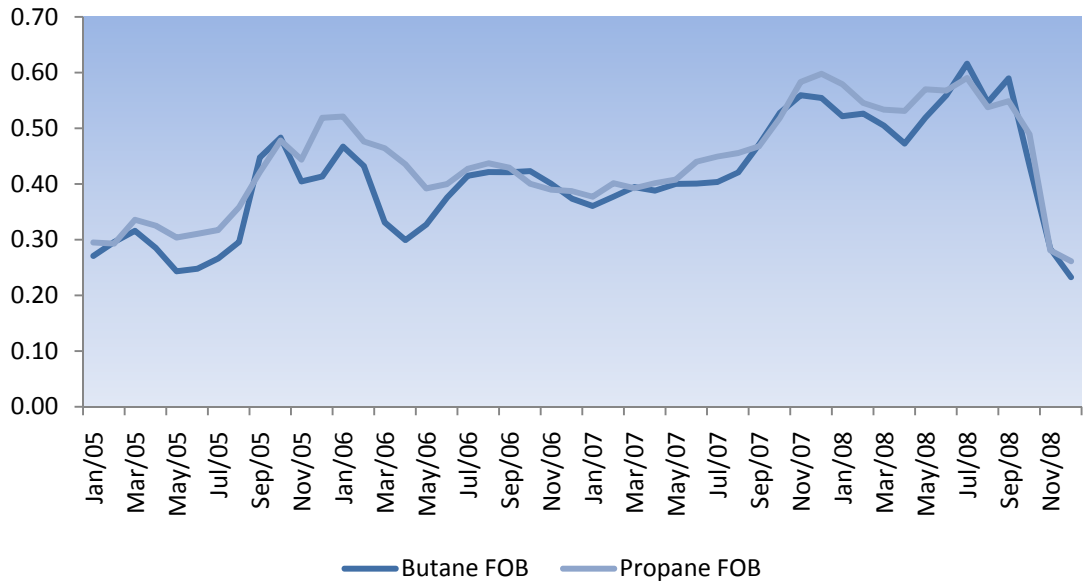
	2001	2002	2003	2004	2005	2006	2007
No. of new districts with natural gas	67	11	4	7	9	10	12
Total no. of new districts with natural gas	67	78	82	89	98	108	120
Results of the Mann-Whitney test							
Rejection of H0	48	7	3				
α=1%	35	3	1				
α=5%	10	4	1				
α=10%	3	0	1				
Non-rejection of H_0	19	4	1				

13.6. Prices and margins for bottled LPG along the value chain

13.6.1. International prices used as a reference for setting ex-refinery prices

1699. The average monthly international spot prices used as a reference for ex-refinery sales indexed to the quotations for north west Europe (NWE) for propane and butane were on a rising trend from the second half of 2007 up to the third quarter of 2008. In 2008, the highest average prices were observed in July, at €0.615/kg for propane and €0.634/kg for butane. December 2008 saw the lowest average monthly prices of 2008 used as a reference, at €0.26/kg for propane and €0.23/kg for butane, corresponding to a 56% fall for the first and a 58% fall for the second compared with December 2007.

Chart 127 – Moves in the spot prices of propane and butane (FOB, NWE), from January 2006 to December 2008, in € / kg

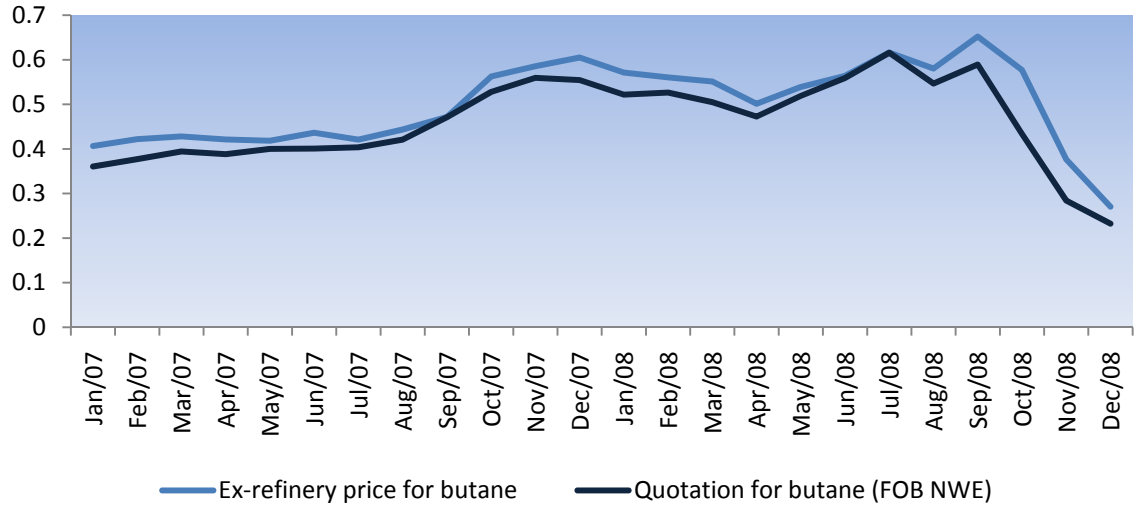


LPG	Year	Average	Standard deviation	Maximum	Minimum
Butane	2006	0.39	0.05	0.47	0.30
	2007	0.44	0.07	0.56	0.36
	2008	0.48	0.12	0.62	0.23
Propane	2006	0.43	0.04	0.52	0.39
	2007	0.46	0.07	0.60	0.38
	2008	0.50	0.11	0.63	0.26

Source: DGEG.

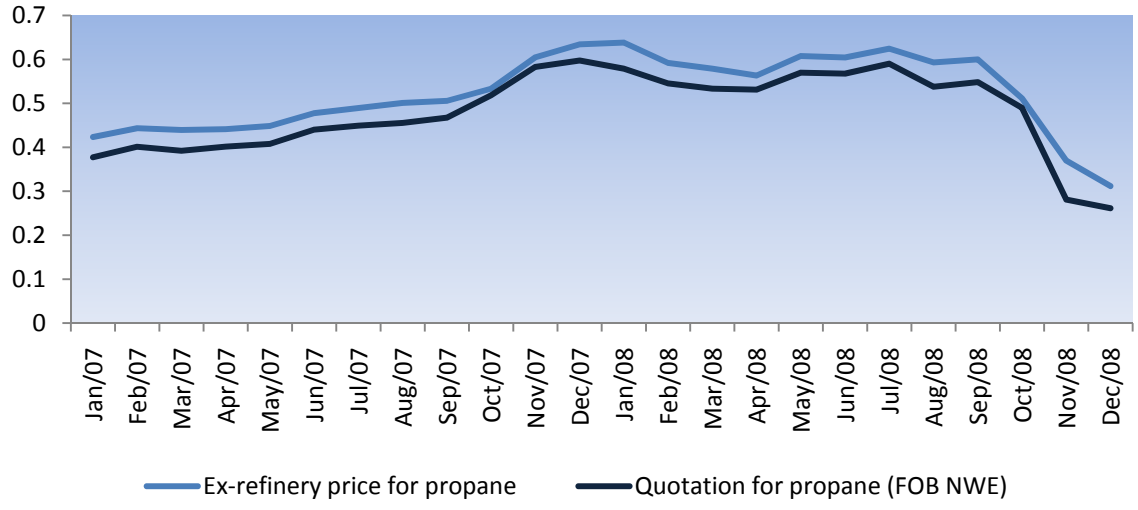
1700. The following analysis of the charts leads to the conclusion that the average monthly ex-refinery prices charged in Portugal for butane and propane were similar to the international series used as a reference (FOB NWE).

Chart 128 – Moves in the spot prices (FOB, NWE) and *ex-refinery* prices for butane from January 2007 to December 2008, in € / kg



Source: Competition Authority analysis based on data from Galp and DGEG.

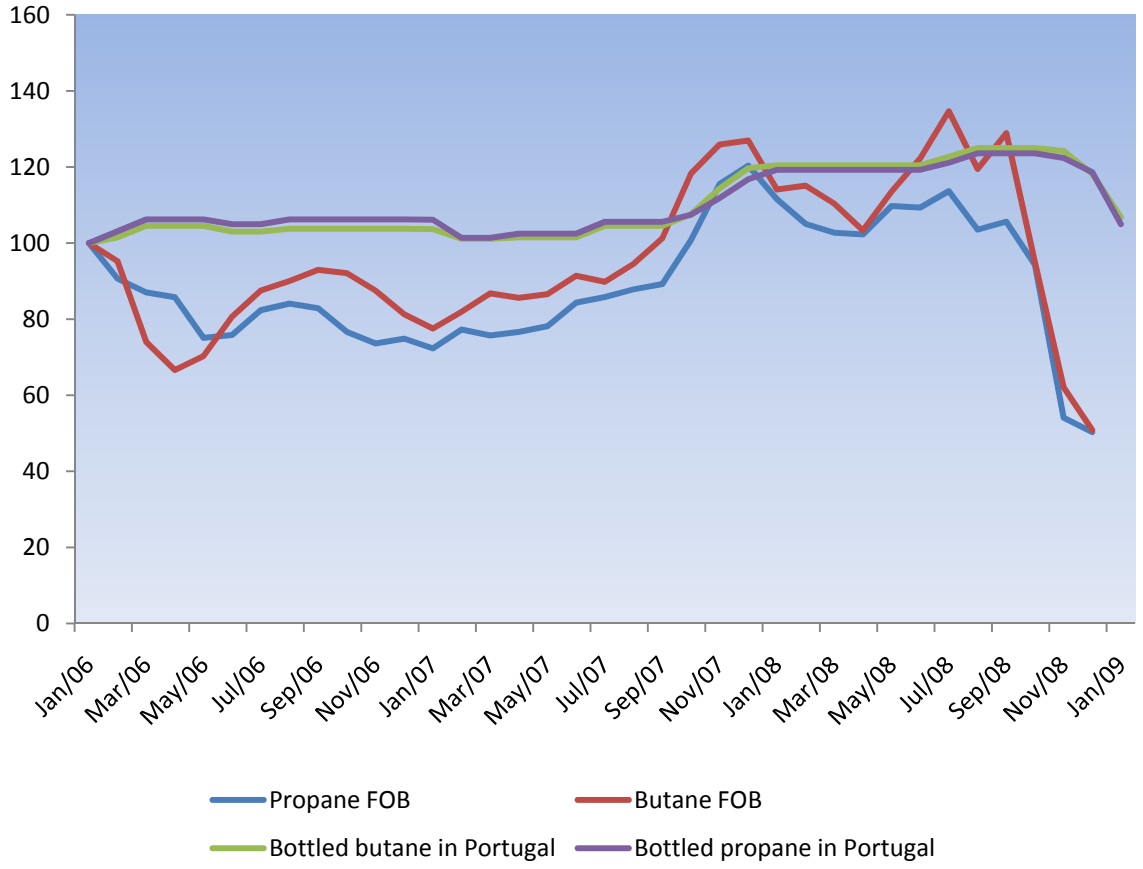
Chart 129 – Moves in the spot prices (FOB, NWE) and *ex-refinery* prices for propane, from January 2007 to December 2008, in € / kg



Source: Competition Authority analysis based on data from Galp and DGEG.

1701. The volatility of average monthly spot prices for butane and propane is higher than for the retail prices of bottled propane and butane. However, the volatility of this series during the period under review was lower than it was for liquid fuel prices.

Chart 130 – Index of averagemonthly spot prices for butane and propane and retail prices for bottled gas in Portugal (Jan-06=100) from January 2006 to December 2008



Source : Reuters (international prices) and DGEG (domestic prices).

1702. Towards the end of 2008 there was a steep fall in the prices for bottled butane and propane, tracking the move in the international quotations used as a reference. Indeed, although the average price of butane for the fourth quarter of 2008 was €1.54/kg and propane was €1.86/kg, the average prices of these products in the last month of the year were €1.41/kg and €1.69/kg.

Table74 – Average quarterly spot prices for butane and propane (FOB, NWE) and for retail prices of butane and propane in Portugal between the first quarter of 2006 and the fourth quarter of 2008, in €/kg

	1T06	2T06	3T06	4T06	1T07	2T07	3T07	4T07	1T08	2T08	3T08	4T08
Butane FOB	0.41	0.33	0.41	0.40	0.38	0.40	0.44	0.57	0.54	0.54	0.62	0.32
Propane FOB	0.48	0.41	0.43	0.39	0.39	0.41	0.46	0.58	0.57	0.58	0.59	0.34
Bottled butane	1.35	1.37	1.37	1.37	1.35	1.34	1.38	1.50	1.59	1.59	1.64	1.54
Bottled propane	1.66	1.70	1.70	1.71	1.66	1.65	1.70	1.80	1.92	1.92	1.98	1.86

13.6.2. Price lists for first line distributors

1703. In the period between January 2007 and March 2009, the four competitors in the bottled gas market made, on average, 12 changes to their price lists, i.e. an average of 6 per year. The price paid for the product by the retailer includes all the costs up to the storage facilities, including: the price of the butane and propane, the cost of primary transport, the cost of primary storage and the cost of secondary transport.

Chart 131 – Average price lists for butane (13 kg bottle) for first line distributors from January 2007 to March 2009

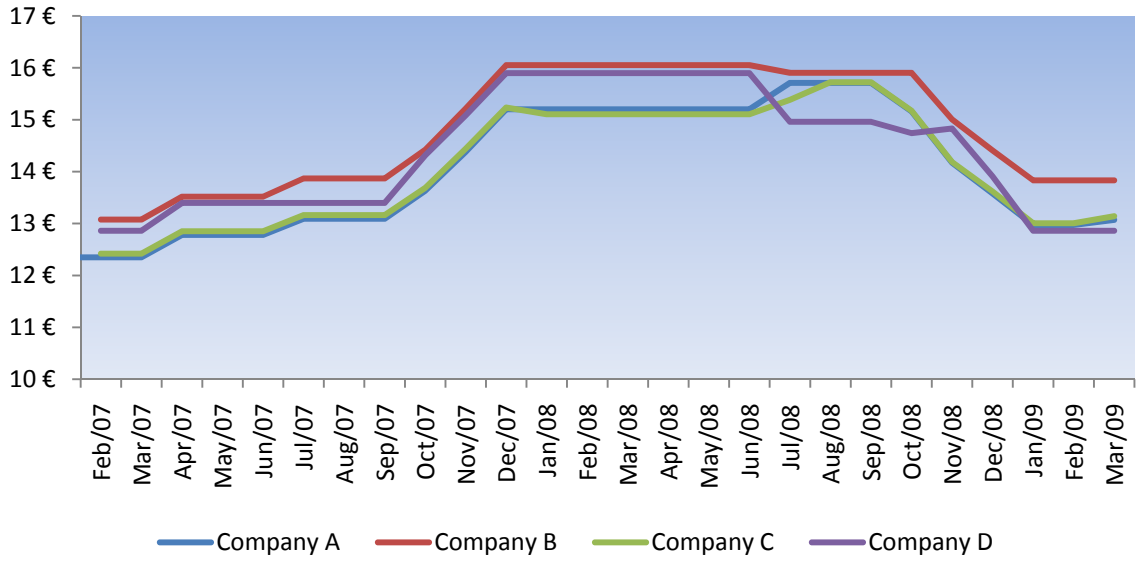
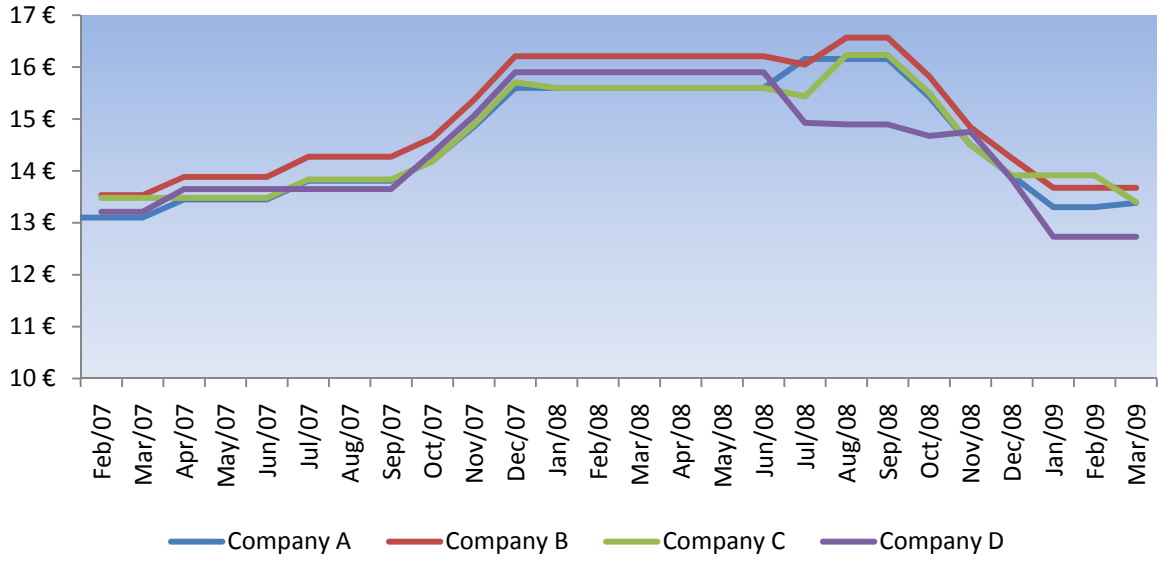


Chart 132 – Average prices de propane (11 kg bottle) for first line distributors from January 2007 to March 2009

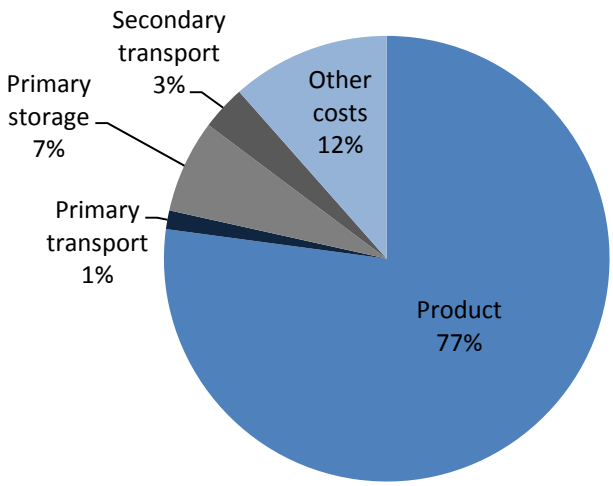


Source: Analysis of the Competition Authority based on data da BP, Esso, Galp and Repsol.

13.6.3. Moves in suppliers' LPG margins

1704. It is estimated that the cost of the butane and propane themselves represents in average terms around 77% of its total cost. Primary storage accounts for 7%, primary transport 1% and secondary transport 3%.

Chart 133 – Cost structure of bottled LPG

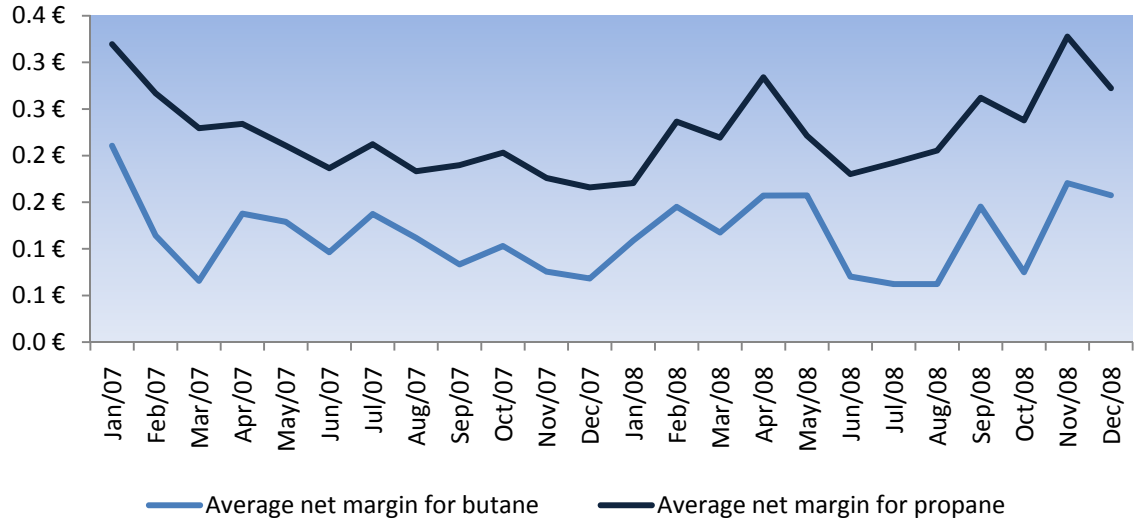


Source: Portuguese Competition Authority Fonte: AdC.

1705. In average terms, considering the net margin on sales of LPG, based on accounting details supplied by suppliers (i.e., considering the costs of the product, plus primary transport, primary storage, secondary transport and other structure costs), estimates can be obtained for the average margins of butane at €0.12/kg and propane at €0.22/kg.

1706. In the period between January 2007 and December 2008, the average minimum monthly margin was €0.06/kg for butane and €0.17/kg for propane, and the average maximum monthly margin was €0.21/kg for butane and €0.33/kg for propane.

Chart 134 – Moves in the average net margins for propane and butane from January 2007 to December 2008, in € / kg



Source: Analysis of the Competition Authority based on data from BP, Esso, Galp and Repsol.

Table 75 – Moves in the average net margins for propane and butane from January 2007 to December 2008, in € / kg

Product	Average	Standard deviation	Confidence interval (95%)	Maximum	Minimum
Butane	€0.12	€0.04	[€0.10;€0.13]	€0.21	€0.06
Propane	€0.22	€0.04	[€0.21;€0.24]	€0.33	€0.17

Source: Analysis of the Competition Authority based on data from BP, Esso, Galp and Repsol.

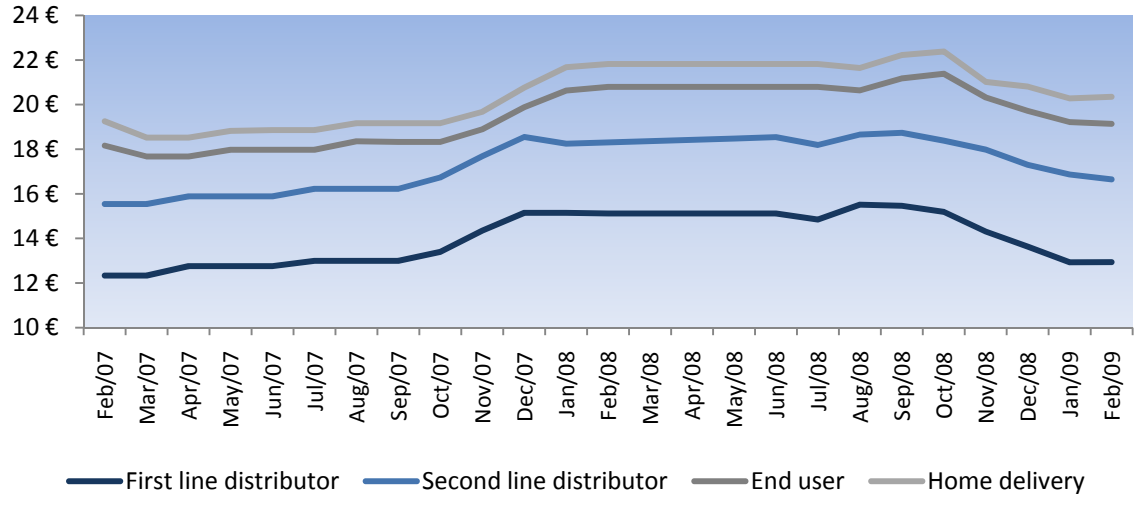
13.6.4. Moves in prices and margins for bottled butane and propane along the distribution chain

1707. The following analysis of the retail price for butane (13 kg bottle) and propane (11 kg bottle) is based on data obtained by the Competition Authority from a sample of retailers who sold gas as a fuel in bottles[237] during the period from February 2007 to February 2009.

13.6.5. Butane

1708. An analysis of the average prices paid for butane (13 kg bottle) by first line distributors, second line distributors, customers at points of sale and customers with delivery to their home shows that there were stable differentials in the average prices along the value chain in 2007 and in 2008. For this period, there was an average monthly differential of €3.32 between the prices that the first and the second line distributors were paying, €5.51 between the prices that the first line distributors and customers were paying, €2.19 between the prices that the second line distributors and customers were paying, and €0.95 with delivery to their home.

Chart 135 – Average prices for butane (13 kg bottle) along the value chain from February 2007 to February 2009



Source: Analysis of the Competition Authority based on data from LPG wholesalers

[237] A random stratified sample process was used for the market share of the brands sold and per NUT II, 95% confidence interval and €0.2 accuracy.

1709. It can be seen that the first line distributor, in relative terms, puts an average 24% margin on the purchase price when selling to the second line distributor and 40% when selling to the customer. The second line distributor has a 13% margin on the purchase price from the first line distributor.

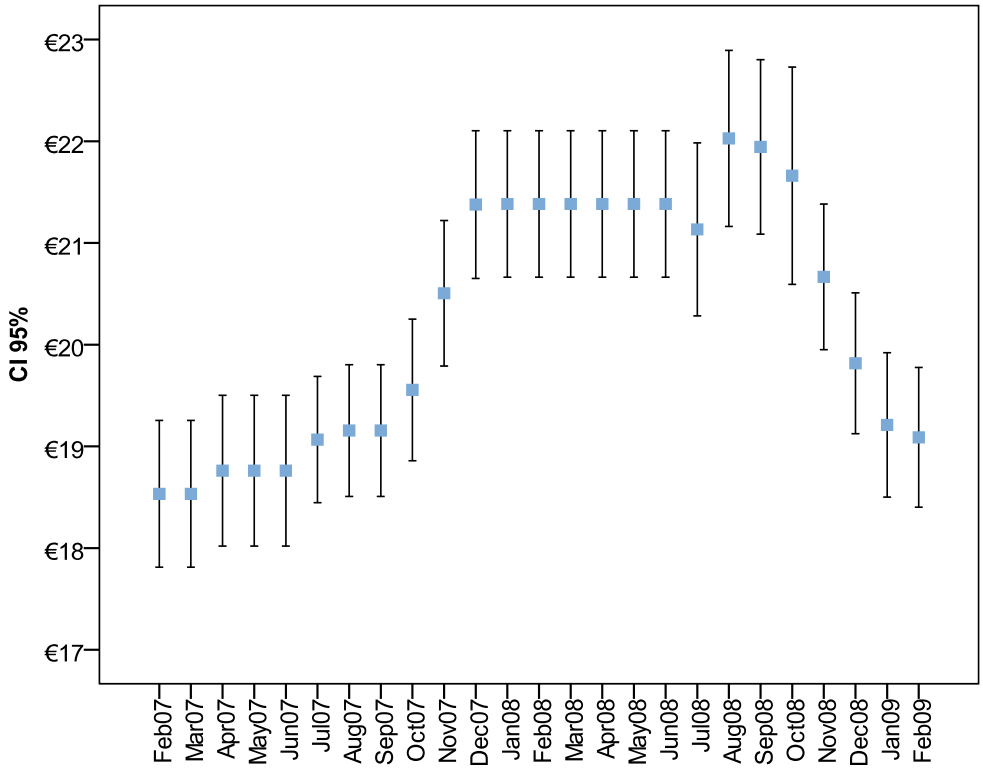
Table 76 – Average margins for butane (13 kg bottle) along the value chain, from February 2007 to February 2009

Variabale	Stage in the chain	Average	Standard deviation	Confidence interval (95%)	Maximum	Minimum
Prices (€)	First line distributor (a)	€14.02	€1.15	[€13.54;€14.49]	€15.52	€12.34
	Second line distributor (b)	€17,34	€1.15	[€16.86;€17,82]	€18.74	€15.54
	Customer (c)	€19.53	€1.29	[€18.99;€20.06]	€21.39	€17,67
	Home (d)	€20.48	€1.35	[€19.93;€21.04]	€22.38	€18.52
Margins (€)	(e)=(b)-(a)	€3.32	€0.21	[€3.24;€3.41]	€3.93	€3.10
	(f)=(c)-(b)	€2.19	€0.41	[€2.02;€2.36]	€3.01	€1.20
	(g)=(c)-(a)	€5.51	€0.48	[€5.31;€5.71]	€6.28	€4.54
	(h)=(d)-(a)	€0.95	€0.12	[€0.90;€1.01]	€1.21	€0.70
Margins (%)	(e)/(a)	24%	3%	[€0.23;€0.25]	30%	20%
	(f)/(b)	13%	2%	[€0.12;€0.14]	17%	7%
	(f)/(a)	40%	5%	[€0.37;€0.41]	49%	31%
	(h)/(c)	5%	1%	[€0.046;€0.051]	6%	3%

Source: Analysis of the Competition Authority based on data from LPG wholesalers

1710. An analysis of the distribution of prices for bottles of butane (13kg) in 2007 and 2008 show that retail prices vary. For example, in February 2007 a €2.40 range was observed between the maximum value (€19.30) and the minimum value (€16.90); in February 2008 a €2.45 range was observed between the maximum value (€21.80) and the minimum value (€19.35); and in February 2009 a €2.49 range was observed between the maximum value (€20.50) and the minimum value (€18.01).

Chart 136 – Confidence interval in the average retail price (PMVP) for butane (13 kg bottle) from February 2007 to February 2009



Source: Analysis of the Competition Authority based on data from LPG wholesalers.

1711. In the period under review, the maximum average monthly retail price (€21.31) was recorded in Setember 2008. From the sample analysed, it can be seen that the lowest average monthly retail price in this month was €20.35 and the highest price was €22.40.

1712. In December 2008 the average monthly retail price was €18.58, lower than in December 2007, when it was €20.62.

1713. According to the most recent observation available (February 2008), the average monthly retail price was €18.92, lower than in February 2008, when it was (€20.63).

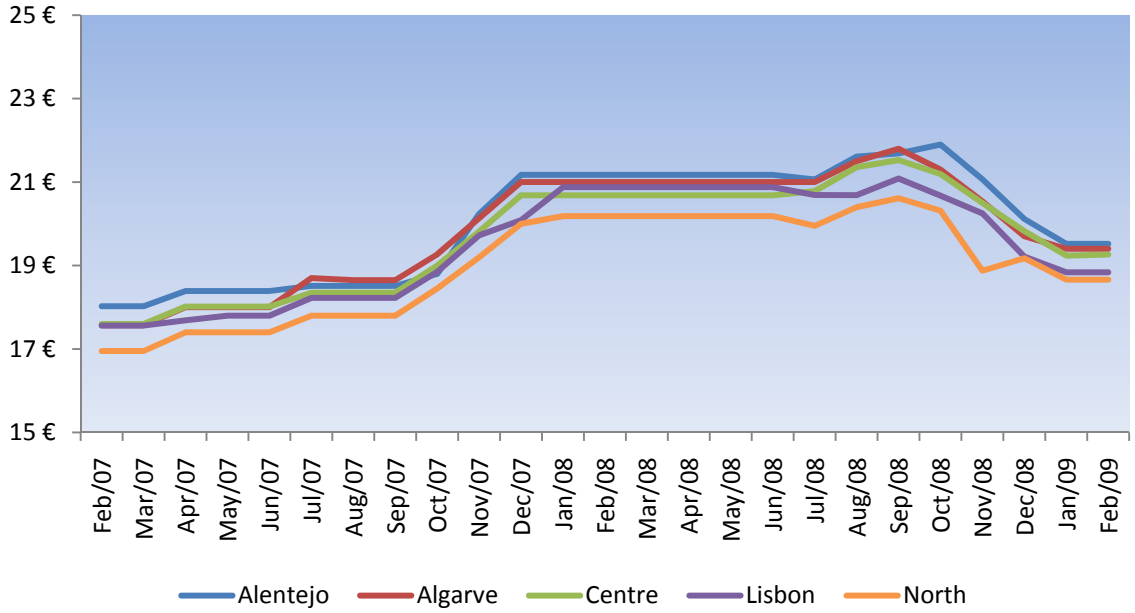
Table 77 – Descriptive statistics of the average retail price for butane (13kg bottle)

	Av. retail price Feb 2007	Av. retail price Dec 2007	Av. retail price Feb 2008	Maximum av. retail price Sep 2008	Av. retail price Dec 2008	Av. retail price Feb 2009
Average	€17,64	€20.62	€20.63	**€21.31**	€19.58	€18.92
Standard deviation	€0.75	€0.79	€0.72	**€0.64**	€0.58	€0.64
Confidence interval 95%	[€17,18; €18.09]	[€17,52; €20.92]	[€20.19; €21.07]	**[€20.94; €21.68]**	[€17.27; €19.80]	[€18.54; €19.30]
maximum	€19.30	€21.80	€21.80	**€22.40**	€21.20	€20.50
Minimum	€16.90	€18.40	€19.35	**€20.35**	€18.55	€18.01

Source: Analysis of the Competition Authority based on data from LPG wholesalers

1714. In general terms, the average retail prices for butane (13 kg bottle) vary according to the region, being lower in the north and higher in the Alentejo. In February 2007, for example, the average price of butane was €16.95 in the North (maximum regional value) and €18.03 in the Alentejo (minimum regional value); in February 2008 the average price was €21.18 in the Alentejo and €20.18 in the North; and in February 2009 the average price was €19.52 in the Alentejo and €18.66 in the North.

Chart 137 – The average retail price of butane (13 kg bottle) per NUT II from January 2007 to February 2009

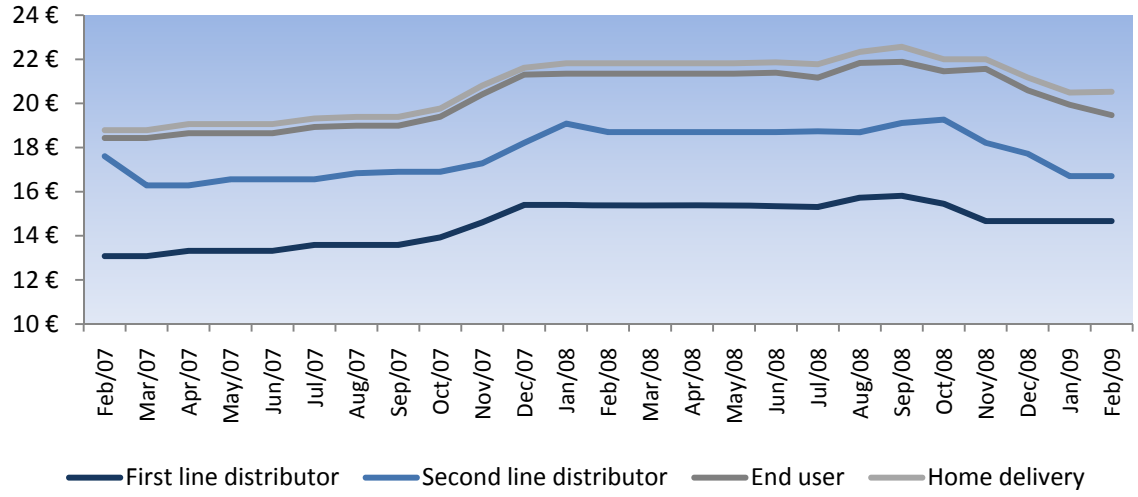


Source: Analysis of the Competition Authority based on data from LPG wholesalers

13.6.6. Propane

1715. An analysis of the average prices for buying propane (11 kg bottle) by first line distributors, second line distributors, retail customers and constomers with home delivery shows stable differentials in average prices along the value chain in 2007 and in 2008. There is an average monthly differential of €3.19 between the purchase prices for first line and second line distributors, of €5.71 between the purchase prices for second line distributors and customers, of €2.53 between the purchase prices for second line distributors and customers, and €0.48 for home delivery.

Chart 138 – Average prices for propane (11 kg bottle), along the value chain from February 2007 to February 2009



Source: Analysis of the Portuguese Competition Authority based on data from LPG wholesalers

1716. In relative terms, a first line distributor obtains an average margin of 35% on the purchase price when selling to the second line distributor and 47% when the sale is directly to the end user. The second line distributor obtains an average margin of 14% on the price paid to the first line wholesaler.

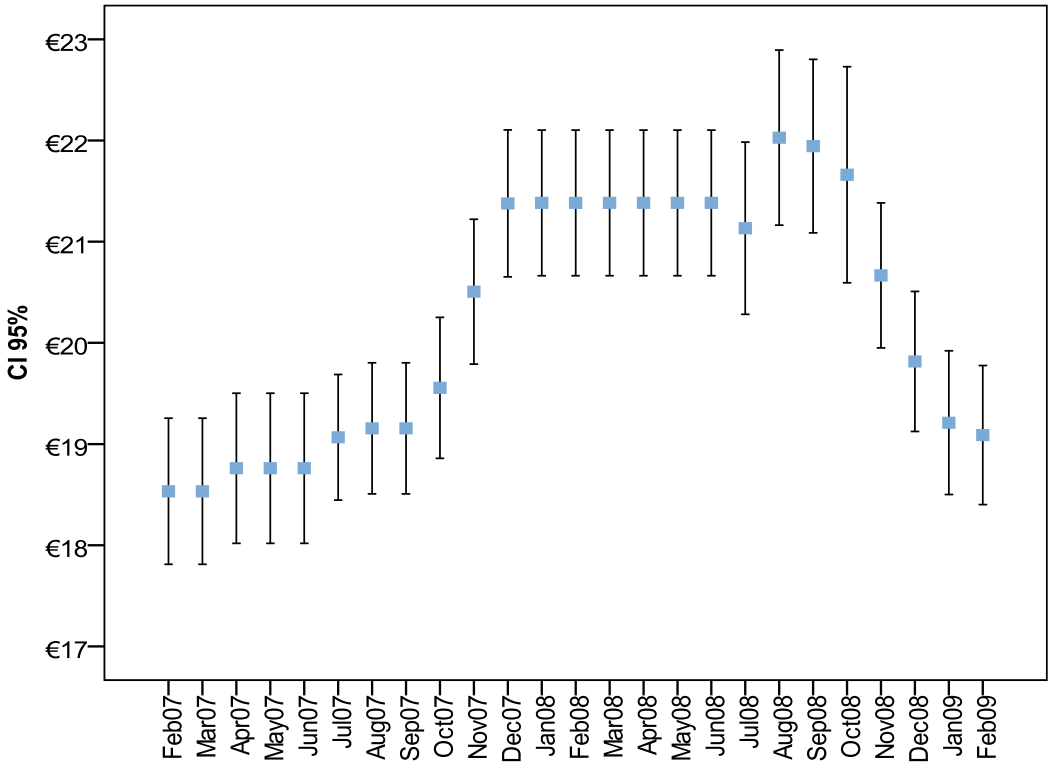
Table 78 – Average margins for propane (11 kg bottle) along the value chain from February 2007 to February 2009

Variable	Stage on the chain	Average	Standard deviation	Confidence interval (95%)	Maximum	Minimum
Prices (€)	First line distributor (a)	€14.56	€0.92	[€14.17;€14.95]	€15.81	€13.08
	Second line distributor (b)	€17,75	€1.02	[€17,32;€18.18]	€19.27	€16.29
	Customer (c)	€20.28	€1.24	[€19.75;€20.89]	€21.89	€18.43
	Home delivery (d)	€20.76	€1.28	[€20.22;€21.30]	€22.57	€18.79
Margins (€)	(e)=(b)-(a)	€3.19	€0.49	[€2.98;€3.39]	€4.52	€2.04
	(f)=(c)-(b)	€2.53	€0.51	[€2.31;€2.74]	€3.35	€0.83
	(g)=(c)-(a)	€5.71	€0.42	[€5.54;€5.89]	€6.90	€4.80
	(h)=(d)-(a)	€0.48	€0.15	[€0.42;€0.54]	€1.06	€0.31
Margins (%)	(e)/(a)	22%	4%	[€0.20;€0.24]	35%	14%
	(f)/(b)	14%	3%	[€0.13;€0.15]	19%	5%
	(f)/(a)	39%	2%	[€0.38;€0.40]	47%	33%
	(h)/(c)	2%	1%	[€0.02;€0.03]	5%	1%

Source: Analysis of the Competition Authority based on data from LPG wholesalers

1717. In terms of propane (11 kg bottle), prices varied in each month. In February 2007, the range between the maximum price (€20.00) and the minimum price (€17.20) was €2.80; in February 2008, the range between the maximum price (€23.05) and the minimum price (€20.15) was €2.90; and in February 2009, the range between the maximum price (€20.05) and the minimum price (€18,10) was €1.95.

Chart 139 – Confidence interval for the average retail price for propane (11 kg bottle) from February 2007 to February 2009



Source: Analysis of the Competition Authority based on data from LPG wholesalers

1718. In the period under review, the maximum monthly retail prices (€21.79) were recorded in September 2008. From the sample being analysed, it can be seen that the lowest retail price was €20.30 and the highest price was €23.65.

1719. In December 2008 the average retail price was €19.58, lower than in December 2007, when it was €18.53.

1720. According to the latest data available (November 2008), the average retail price was €19.09, lower than in February 2008 (€21.38).

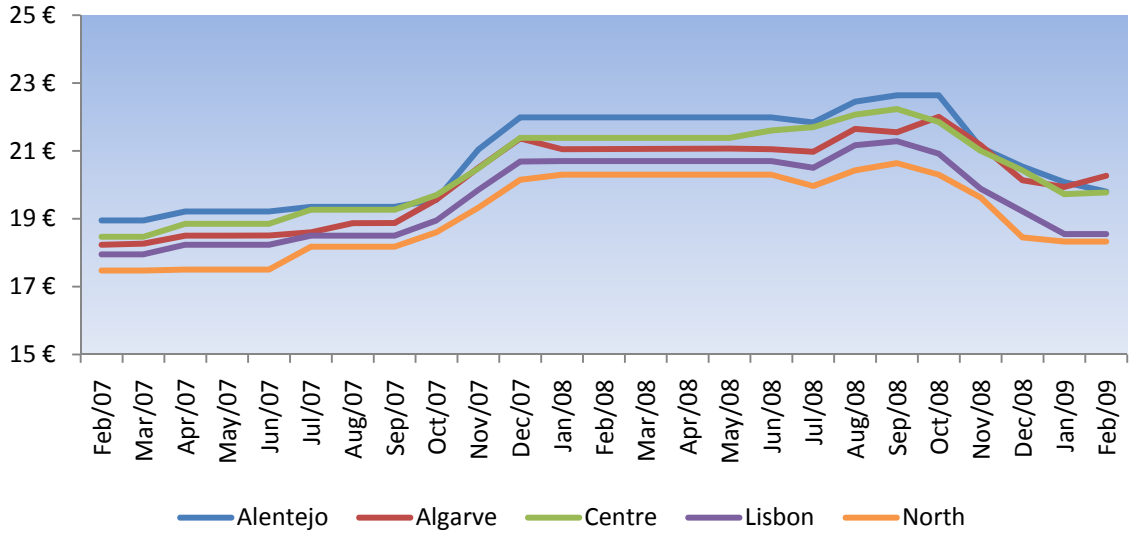
Table 79 – Descriptive statistics of the average retail price for propane (11 kg bottle) in euros

	Av. retail price Fev 2007	Av. retail price Dec 2007	Av. retail price Fev 2008	Maximum av. retail price Set 2008	Av. retail price Dec 2008	Av. retail price Fev 2009
Average	€18,53	€21.23	€21.38	**€21.79**	€19.68	€19.09
Standard deviation	€0.94	€0.90	€0.94	**€1.07**	€1.17	€0.89
Confidence interval 95%	[€17.81; €19.26]	[€20.89; €21.59]	[€20.66; €22.10]	**[€21.17; €22.40]**	**[€21.17; €22.40]**	[€18.4; €19.78]
Maximum	€20.00	€23.05	€23.05	**€23.65**	€21.20	€20.05
Minimum	€17.20	€19.70	€20.15	**€20.30**	€16.50	€18,10

Source: Analysis of the Competition Authority based on data from LPG wholesalers

1721. As observed for butane, the average retail price for bottles of propane is lower in the north and higher in the Alentejo. For example, the average retail price for a bottle of propane in February 2007 was €17.48 in the north and €18,95 in the Alentejo, in February 2008 it was €20.30 in the north and €21.99 in the Alentejo and in February 2009 it was €18,33 in the north and €20.27 in the north and Alentejo.

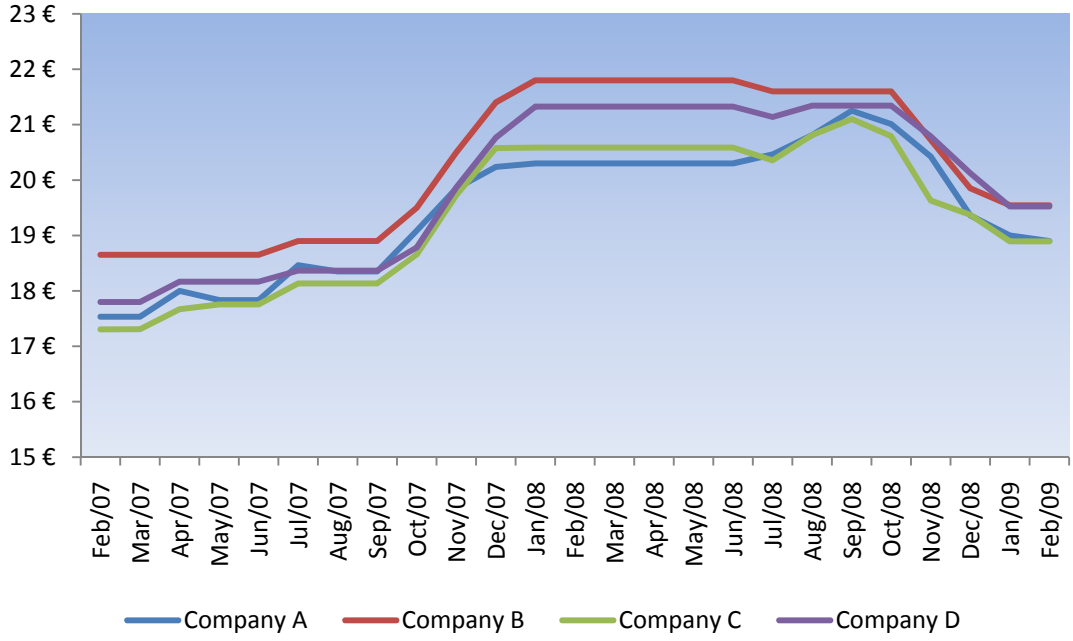
Chart 140 – The average retail price of propane (11 kg bottle), per NUT II in 2007 and 2008



Source: Analysis of the Competition Authority based on data from LPG wholesalers.

1722. In terms of the average monthly retail price charged for a bottle of butane (13 kg) by the four companies, there is an average range of €1.04/bottle between the maximum and the minimum price. In general, there is a bigger range in average monthly retail price inter-companies in the periods when there were the highest prices of LPG in the international markets.

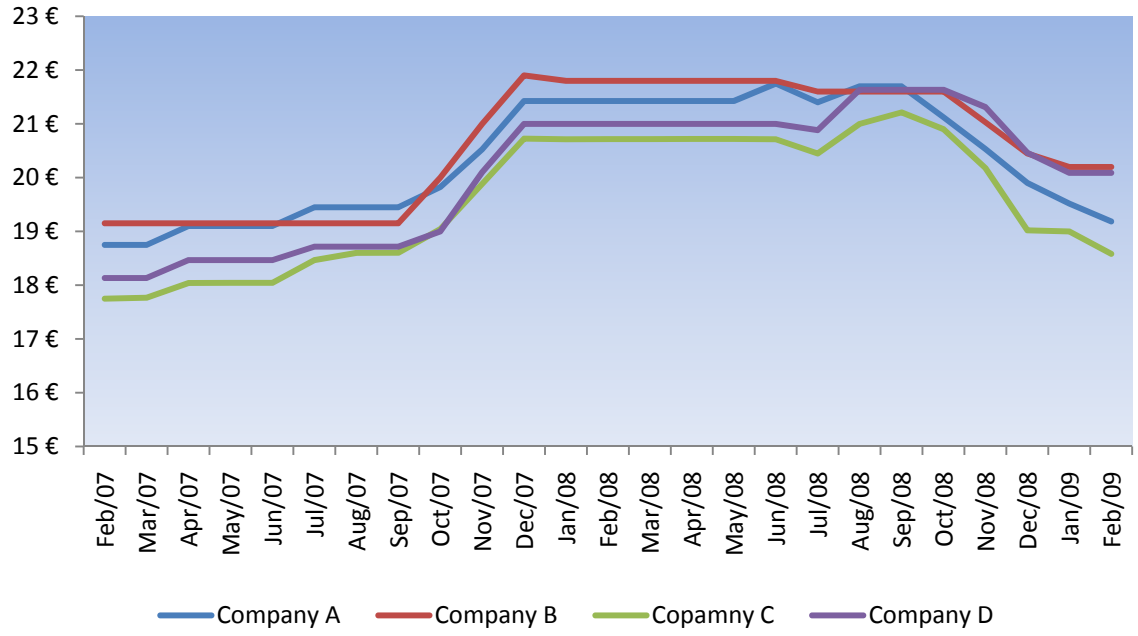
Chart 141 – The average retail price of butane (13 kg bottle) per brand in 2007 and 2008



Source: Analysis of the Competition Authority based on data from LPG wholesalers.

1723. The average monthly retail price range (inter-brands) charged for a bottle of propane (13 kg) by the four companies was €1.03/bottle.

Chart 142 – The average retail price of propane (11 kg bottle) per brand in 2007 and 2008



Source: Analysis of the Competition Authority based on data from LPG wholesalers.

13.7. International comparison of prices

1724. In January 2009, Portugal had the lowest retail price for bottled butane (€1.41/kg), out of a selection of four European countries where there are no price controls on the product. The highest retail price per kg was in Denmark (€2.79/kg), followed by Italy (€2.25/kg).

1725. In those countries where prices are regulated, the lowest prices were in Spain[238] (€1.08/kg), followed by Luxembourg (€1.15/kg) and Belgium (€1.36/kg).

1726. In the 2007 to 2008 period, prices before tax were lowest in Spain (€0.93/kg) and the highest were in Denmark (€1.95/kg).

1727. In terms of tax, the highest was in Denmark and the lowest was in Luxembourg.

[238] In Spain the retail price includes delivery of bottles of LPG to customers' homes.

Chart 143 – International comparison of average retail prices of butane in 2009, in € / kg

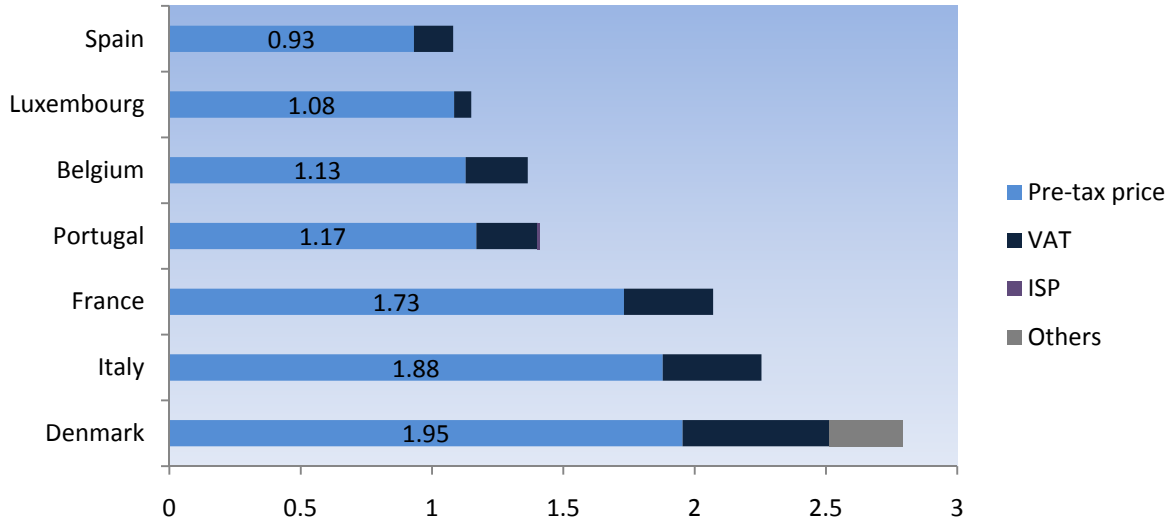


Table 80 – International comparison of average retail prices of bottled butane, in € / kg, in January 2007, 2008 and 2009

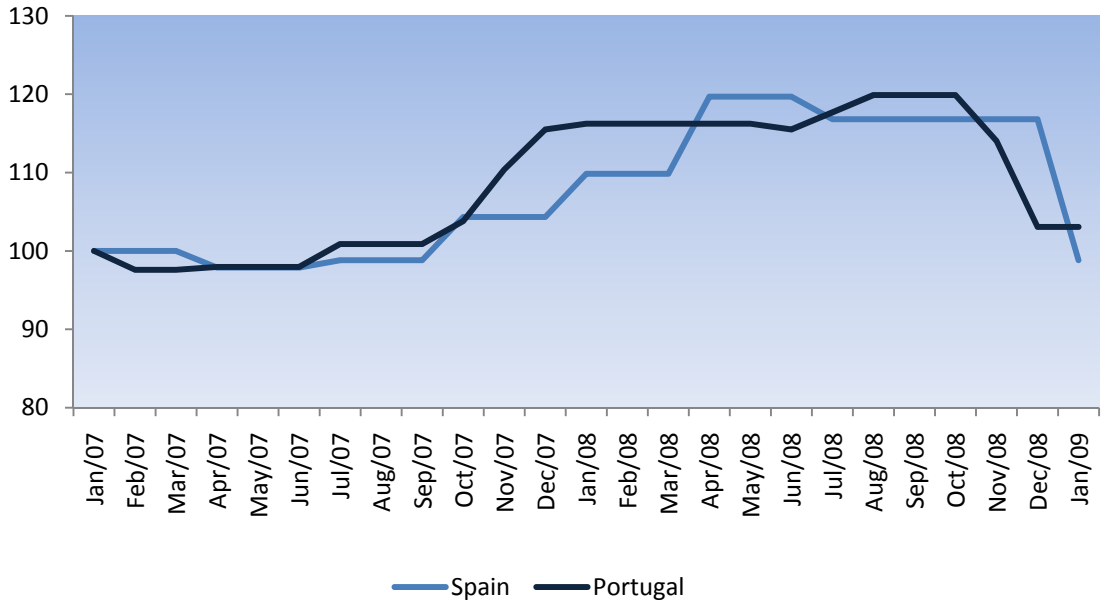
	Portugal	Belgium	Denmark	Spain	France	Italy	Luxembourg
2007	1.37	1.50		1.09	1.98	2.12	1.17
2008	1.59	1.76	2.91	1.21	2.03	2.48	1.46
2009	1.41	1.36	2.79	1.08	2.07	2.25	1.15

Source: Portugal – DGEG; Belgium and Luxembourg – Federaration Butane Propane; Denmark – Danish Energy Authority; Spain – Corporacion de Reservas Estratégicas de Productos Petrolíferos; Italy – Camara di Commercio Industria Artigianato e Agricoltura di Reggio Emilia.
Note : VAT: Belgium – 21%; Spain – 16%; Portugal – 20%, Italy – 20% ; Luxembourg – 6, % Denmark – 25%.

1728. In terms of the variation in the pre-tax prices of butane in Portugal and Spain, the behaviour is similar, with a greater number of changes in the prices in Portugal than in Spain[239] (stemming from the price regulations for LPG in the latter).

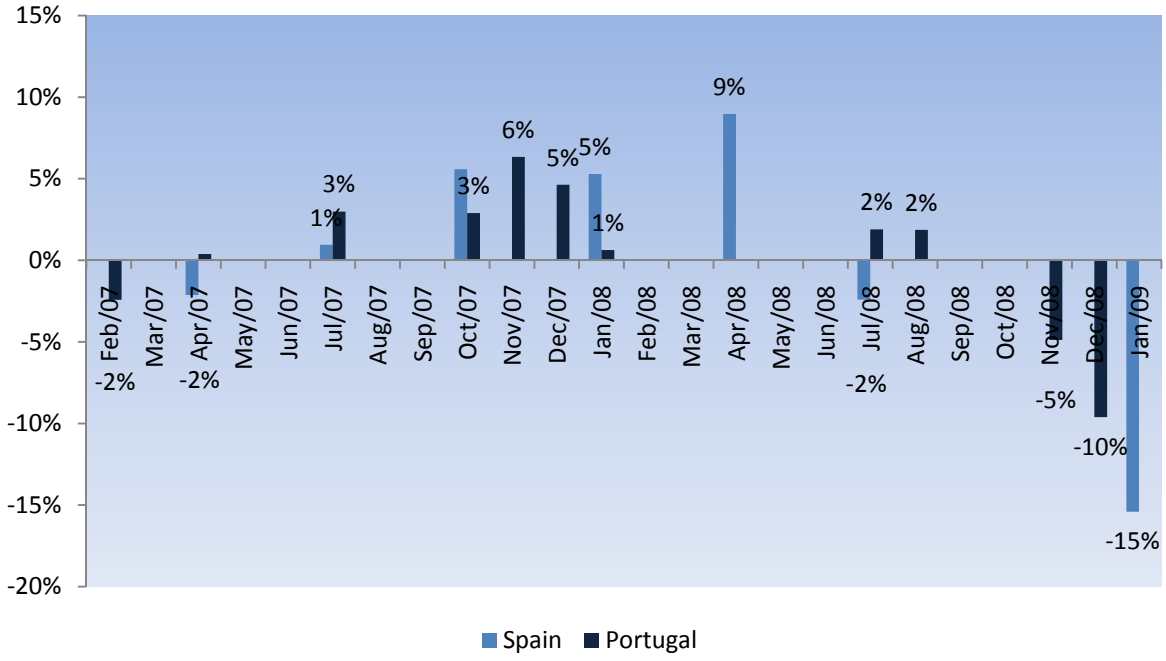
[239] The price system in Spain is fixd by ministerial dispatch on a monthly basis.

Chart 144 – Index of the variation in prices of butane in Portugal and in Spain (Jan-06=100), between January 2006 and January 2009



1729. At the end of 2008, there was a 5% fall in the price of butane in November and 10% in December. In Spain, the falls in the international reference quotations were only reflected in the price of butane in January 2009, when there was a 15% drop.

Chart 145 – Rate of variation in prices for butane in Portugal and in Spain



1730. In terms of bottled propane, the pre-tax price in Portugal at the start of 2009 (€1.69/kg) was lower than in France (€2.07/kg), but higher than in countries where there was price control. For instance, the pre-tax price of propane in Belgium was €1.52/kg and in Luxembourg it was €1.25/kg.

1731. At the start of 2009, the lowest pre-tax price was in Luxembourg (€1.18/kg), followed by Belgium (€1.26/kg), Portugal (€1.40/kg) and France (€1.73/kg).

Chart 146 – International comparison of average retail prices for butane in 2009, in € / kg

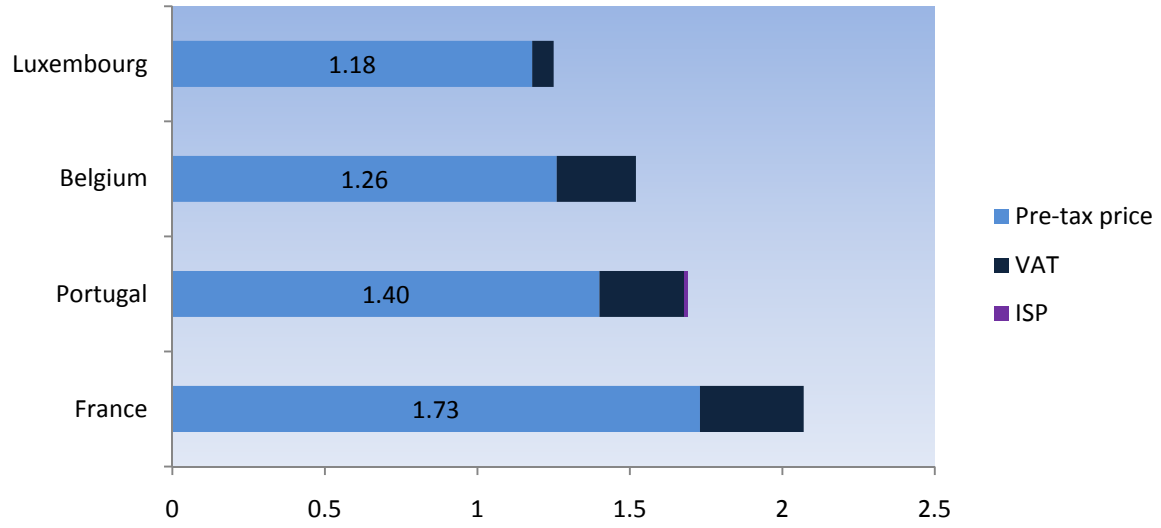


Table 81 – International comparison of average retail prices for bottled propane in January 2007, 2008 and 2009, in € / kg

	Portugal	Belgium	France	Luxembourg
2007	1.71	1.74	1.98	1.20
2008	1.92	1.85	2.03	1.58
2009	1.69	1.52	2.07	1.25

Fonte: Portugal – DGEG; Belgium and Luxembourg – Federaration Butane Propane; France - Observatoire de l'énergie.
Note : VAT: France - 19,6% ; Belgium – 21%; Portugal – 20%, Luxembourg – 6%.

13.8. Conclusions

1732. This section has provided a discription of the market for gas as fuel in mainland Portugal, with special emphasis on the bottled gas segment.

1733. On average, around two-thirds of LPG consumed in mainland Portugal is imported and the remainder is produced in the Sines and Matosinhos refineries.

1734. The supply of bottled butane and propane is quite concentrated, with the two main companies holding a market share of 72% in 2008 and IHH at a value of 3.352.

1735. There are obstacles to penetration in the supply of botled LPG, fundamentally because of the costs of transport, economies of scale, storage requirements, access to infrastructures, the high level of wastage from bottles, a network of distribution contracts and customer loyalty to a specific brand.

1736. Distribution of gas in bottles is carried out by all the companies that work in the domestic market, using not only first line distributors that cover the whole country and have distribution contracts, but also by second line wholesalers and also retailers (for example small scale-trade – mini-markets, grocery stores, shops that sell domestic appliances, cafés, service stations and so on). They pick up supplies at first line wholesalers.

1737. The specific nature of LPG demands special precautions for storage in suppliers' depots, for the process of filling the bottles and for handling and sales.

1738. The LPG sold in Portugal is governed by specific technical characteristics, definied in Decree Law no. 89/2008, of 30 May. These are more rigorous than those in force in Spain. As a result, LPG produced in Spain has to go through separate storage before it can be distributed for consumption in Portugal.

1739. In terms of the tax situation, LPG is subject to VAT at 20%, to which is added the special fuel tax. This makes the tax higher than for other kinds of energy that could provide an alternative, such as natural gas, on which VAT is levied at 5% for domestic purposes. The higher tax burden gives a fiscal advantage to energy products that compete most directly with LPG, specifically natural gas, and this potentially cuts down the competition between alternative sources of energy.

1740. In addition, the fiscal regime applied to the transmission of gas as fuel is different from what is applied to liquid fuel. Indeed, Law no. 9/86, of 3 April did not include revocation of the stipulations governing settlement of VAT after liberalisation of prices for LPG from 3 September 1990 so it is the distributors

who pay the VAT, calculated on a formula that pressuposes administrative control over prices. The regime in force demands an estimate of the sales margin of the distributors, and this is added to the price on which VAT is levied. The need to estimate a bulk margin and consequently a figure for sale to the public could bring about a situation where retail prices charged inter- and intra-marca are levelled out.

1741. In terms of demand, there has been a fall in the consumption of LPG in the last decade, and a clear pattern of seasonality in consumption visible, associated with greater needs during the winter months. Demand for LPG is associated with a low level of demand/price elasticity. Demand for LPG is higher in more densely populated areas (Lisbon and Oporto) and the domestic segment accounts for around 63% of final consumption. An analysis of the consumption of LPG by administrative district shows that *(i)* the fall in consumption was greater in those where a natural gas network was set up in 2001, compared with those where there is no network *(ii)* demand for LPG fell more in administrative districts where natural gas had been introduced than in the periods before it was available.

1742. The domestic oil companies changed their prices for the first line distributors on average six times a year.

1743. In the period between January 2007 and December 2008, estimates for the average margins on sales of LPG by the suppliers (i.e., considering the costs of the product, primary transport, primary storage, secondary transport and other structure costs), came in at €0.12/kg for butane and €0.22/kg for propane.

1744. As for butane (13kg bottle), between February 2007 and February 2009 there was an average monthly differential of €3.32 between prices paid by the first and second line distributors, €5.51 between prices paid by the first line distributors and customers and €2.19 in prices paid by the second line distributors and the customers.

1745. As for propane (13kg bottle), between February 2007 and February 2009 there was an average monthly differential of €3.19 between prices paid by the first and second line distributors, €5.71 between prices paid by the first line distributors and customers and €2.53 prices paid by the second line distributors and the customers.

1746. The analysis of prices for bottles of butane and propane show regional and inter-brand variations in prices at the level of NUTs II (North, Centre, Lisbon, Alentejo

and Algarve). In general, prices are lower in the north and higher in the Alentejo.

1747. In terms of international comparisons, pre-tax prices and average retail prices for butane and propane in Portugal are higher than in those countries where prices are regulated (among them Spain, Belgium and Luxembourg), but they are the lowest in a selection of countries where there are no price controls.

Appendix 1 – Econometric modelling of the inter-brand price differentiation at the national retail local market level

1748. As referred in the text (Chapter 11), we describe in this Appendix 1 the proposed econometric modelling of the inter-brand pump price differentiation at the level of each local market in national retail sales of liquid fuels (diesel and IO95 gasoline), using weekly data in the period 2004-2006.

1749. We propose a panel-based econometric model with fixed effects, specific to each brand, which controls for sources of inter-pump heterogeneity other than the "brand effect". Formally, denoting by p_{it} the effective price in pump i at week t, the model to be estimated is described, for each fuel, by the following equations:

$$p_{it} = \alpha + \beta_M I(i \in M) + \gamma_R I(i \in R) + \theta_\tau I(i \in \tau) + \eta Z_i + \lambda_s I(t = s) + \xi_{it}, \quad \text{(A1.1)}$$

for each pump i and for all weeks t, where $I(\cdot)$ denotes a dummy (or binary) variable which takes the value of 1 if its inner expression is true and the value of zero otherwise, M indexes the pump's brand and β_M the corresponding fixed effect, R indexes the pump location (municipality or NUTS-III) and γ_R the corresponding fixed effect, τ represents the pump type and θ_τ the corresponding fixed effect, λ_S are a set of temporal fixed effects, with the respective time series $\{\alpha + \lambda_t;\ t = 1, 2, \ldots, T\}$ – where $T = 157$ is the total number of sampled weeks and α is the model intercept, common to all p_{it} – represents the common inter-temporal component to all p_{it}, Z_i represents the set of the remaining control variables, as referred in the text (section 11.1). Finally, ξ_{it} are white noises (for each i and for all t), of zero mean and time-invariant variance, which are assumed uncorrelated with the RHS variables of the respective equation.

1750. It is worth noting that since all considered pumps and corresponding prices (p_{it}) are subjected to the same fiscal regime (the national), their tax component (excise tax and VAT) is captured by their common time component $\{\alpha + \lambda_t;\ t = 1, 2, \ldots, T\}$, thereby not affecting the estimates of the remaining model coefficients. This implies that the estimated pump price differentials, inter-brand (β_M), inter-regions (γ_R), and inter-pump types (θ_τ) in (A1.1),[240] can be interpreted as price differentials before or after tax.

[240] Estimation is performed in STATA 6 by OLS, using the White's heteroscedastic error correction for better estimation of the model coefficient estimates standard errors.

Appendix 2 – Refineries and refining capacity in the Iberian Peninsula and in France

1751. As referred in the text (Chapter 12), since Spain and France are the only EU15 Member States having refineries located in the two European Platts zones, NWE and MED, we define their reference Platts CIF prices[241] on the basis of the refining capacity these two countries have in these two European Platts zones (see Table 82, Table 83, and Illustration 11 below).

Table 82 – Refining capacity in the Iberian Peninsula (year 2008), discriminated by oil company, refining plant, and by Platts zone (NWE and MED)[242]

Oil company	Refining Plant	kbbl / day	Platts zone	Iberian % Firm	Iberian % Refinery
GALP	Leça da Palmeira	100	NWE	**19.1%**	6.4%
	Sines	200	NWE		12.7%
REPSOL	Coruña	120	NWE	**47.1%**	7.6%
	Bilbao	220	NWE		14.0%
	Tarragona	160	**MED**		10.2%
	Cartagena	100	**MED**		6.4%
	Puertollano	140	**MED**		8.9%
CEPSA (TOTAL)	Tenerife	90	NWE	**27.4%**	5.7%
	Huelva	100	**MED**		6.4%
	Gibraltar - San Roque	240	**MED**		15.3%
BP	Castellón	100	**MED**	**6.4%**	6.4%

Note: "kbbl / day" refers to the refining capacity in thousands of oil barrels per day and "Iberian %" to the percentage each company and refining plant have in the total daily refining capacity in the Iberian Peninsula. Note that REPSOL refining plant in Puertollano is connected through pipeline to its refining plant in Cartagena, thus its location in the Platts MED area.

Source: CLH; BPI Equity Research.

[241] The Platts prices considered in this analysis correspond to, according to Platts specifications, up to the end of the year 2008, in the case of gasoline, NWE and MED "Premium Gasoline 50ppm Cargoes FOB (or CIF)" and in the case of diesel, "Diesel 50ppm Cargoes FOB (or CIF) NWE" and "50ppm ULSD FOB (or CIF) MED Cargoes". Since the beginning of 2009, these specifications have been altered, in the case of diesel, from 50ppm to 10ppm, and in the case of gasoline in zone NWE to "Premium Gasoline 10ppm Barges FOB ARA" and "Gasoline 10ppm Cargoes CIF NWE".

[242] Maps of these plants location together with the major storage facilities and pipeline networks in Portugal and in Spain can be found in Section 6.2.1 and Section 7.3.3 above respectively.

Table 83 – Refining capacity in France, discriminated by oil company, by refining plant, and by Platts zone (NWE and MED)

Oil company	Refining Plant	kbbl / day	Platts zone	% in France Firm	% in France Refinery
TOTAL	Donges	231	NWE	60.7%	9.8%
	Normandie	325	NWE		13.8%
	Flandres	160	NWE		6.8%
	Dunkerque	343	NWE		14.5%
	Grandpuits	99	NWE		4.2%
	Provence	155	MED		6.6%
	Feyzin	119	MED		5.0%
EXXON MOBIL	Port Jérôme	270	NWE	17.4%	11.4%
	Fos-sur-Mer	140	MED		5.9%
PETROPLUS	Petit Couronne	142	NWE	9.3%	6.0%
	Reichstett	77	MED		3.3%
INEOS	Lavera	220	MED	9.3%	9.3%
SHELL	Berre L'Étang	80	MED	3.4%	3.4%

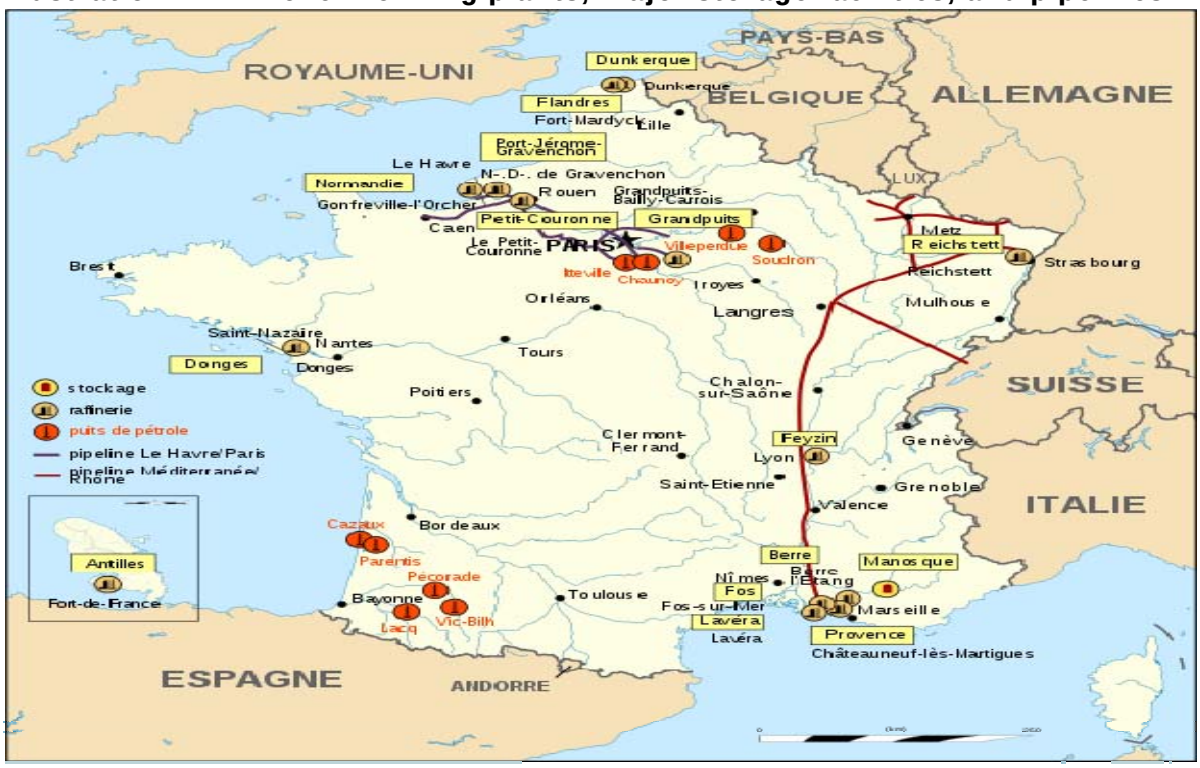
Note: The *Petit Couronne* and *Grandpuits* refineries are in the Platts NWE area as they are connected through pipeline to refineries in that area. In analogy, the *Berre l'Étang*, *Feyzin*, and *Reichstett* refining plants are in the Platts MED area given their connection through pipeline to other plants in that area.

Fonte: Wikipedia e Oil & Gas Journal (cf. http://en.wikipedia.org/wiki/List_of_oil_refineries e "Liste des raffineries françaises" em http://fr.wikipedia.org/wiki/Liste_des_raffineries_fran%C3%A7aises).

1752. Given the information in the Tables above, we have that European Platts zones NWE and MED account for, respectively, 33.8% and 66.2% of the total refining capacity Spain and 66.5% and 33.5% in France. We thereby define the reference Platts CIF prices for these two States as weighted averages of the Platts CIF NWE and MED prices on the basis of those weights.

1753. It is interesting to note that, in general, the total daily refining capacity, in thousands of bbl/day (kbbl/day), takes the values of 310, 1274, and 2361 in Portugal, Spain, and France respectively, which according to the 2004 population census (see Table below), represents, respectively, 29, 32, and 39 oil bbl per day and per thousand inhabitants in each one of these three States.

Illustration 11 – French refining plants, major storage facilities, and pipelines



Source: Wikipedia (cf. http://fr.wikipedia.org/wiki/Fichier:Oil_wells_and_refineries_France_map-fr.svg).

Table 84 – Resident population in each Member State of the EU15 (year 2004)

	Population	EU15 (%)	NWE (%)	MED (%)
Austria	8,174,762	2.1%		2.1%
Belgium	10,348,276	2.7%	2.7%	
Denmark	5,413,392	1.4%	1.4%	
Finland	5,214,512	1.4%	1.4%	
France	60,424,213	15.8%	10.5%	5.3%
Germany	82,424,609	21.6%	21.6%	
Greece	10,647,529	2.8%		2.8%
Ireland	3,969,558	1.0%	1.0%	
Italy	58,057,477	15.2%		15.2%
Luxembourg	462,690	0.1%	0.1%	
Netherlands	16,318,199	4.3%	4.3%	
Portugal	**10,524,145**	**2.8%**	2.8%	
Spain	40,280,780	10.6%	3.6%	7.0%
Sweden	8,986,400	2.4%	2.4%	
UK	60,270,708	15.8%	15.8%	
EU15	**381,517,250**	**100%**	**67.6%**	**32.4%**

Source: U.S. Census Bureau (http://www.census.gov).

1754. Concerning the reference (average) Platts CIF price for the EU15 as a whole, since there is EC data on the total annual consumption (in m^3) for diesel and IO95 gasoline ("euro super 95"), discriminated by Member States and over the

period 2002-2007, we compute, as referred in the text, the reference EU15 Platts CIF price, per fuel, as the average of the Platts CIF prices across Member States weighted by its total annual consumption, per fuel and on average over the period 2002-2007.

1755. This reference EU15 Platts CIF price corresponds then, as referred in the text, to the weighted average of the Platts CIF NWE and Platts CIF MED prices with respective weights of 69.4% and 30.6% in the case of gasoline and of 62.9% and 37.1% in the case of diesel (see Table below).

Table 85 – Total annual consumption of diesel and IO95 gasoline across the EU15, x1000 m³ and in m³ *per capita*, discriminated by Platts zone (NWE and MED), on average over the period 2002-2007

	IO95 Gasoline					(Motor) Diesel				
	Consumption		% Total consumption			Consumption		% Total consumption		
	x1000m3	*Per capita*	EU-15	NWE	MED	x1000m3	*Per capita*	EU-15	NWE	MED
Austria	1,108	0.136	1.8%		1.8%	5,002	0.612	3.5%		3.5%
Belgium	955	0.092	1.6%	1.6%		5,170	0.500	3.6%	3.6%	
Denmark	1,113	0.206	1.8%	1.8%		1,922	0.355	1.4%	1.4%	
Finland	1,248	0.239	2.0%	2.0%		1,701	0.326	1.2%	1.2%	
France	5,503	0.091	9.0%	6.0%	3.0%	26,253	0.434	18.5%	12.3%	6.2%
Germany	12,403	0.150	20.3%	20.3%		24,254	0.294	17.1%	17.1%	
Greece	2,241	0.210	3.7%		3.7%	2,625	0.247	1.9%		1.9%
Ireland	1,264	0.318	2.1%	2.1%		1,753	0.442	1.2%	1.2%	
Italy	10,584	0.182	17.3%		17.3%	20,380	0.351	14.4%		14.4%
Luxembourg	296	0.639	0.5%	0.5%		1,328	2.871	0.9%	0.9%	
Netherlands	3,015	0.185	4.9%	4.9%		5,260	0.322	3.7%	3.7%	
Portugal	**1,030**	**0.098**	**1.7%**	**1.7%**		**3,811**	**0.362**	**2.7%**	**2.7%**	
Spain	4,438	0.110	7.2%	2.5%	4.8%	23,895	0.593	16.9%	5.7%	11.2%
Sweden	2,815	0.313	4.6%	4.6%		2,683	0.299	1.9%	1.9%	
UK	13,201	0.219	21.6%	21.6%		15,755	0.261	11.1%	11.1%	
EU-15	**61,213**	**0.160**	**100%**	**69.4%**	**30.6%**	**141,792**	**0.372**	**100%**	**62.9%**	**37.1%**

Note: The Spanish and French NWE and MED weights correspond to those referred above, used in the computation of the reference Platts CIF prices of these two States.

Source: AdC computations based upon information from the EC DG TREN on the total annual automotive fuel consumption (*cf.* http://ec.europa.eu/energy/reports/Oil_Bulletin_Prices_History.xls).

1756. Following from this table's figures, it is interesting to note that the three largest fuel consumers in the EU15 are: in the case of IO95 gasoline, the UK (21.6%), Germany (20.2%), and Italy (17.2%) and in the case of diesel, France (18.5%), Germany (17.1%), and Spain (16.9%). In terms of the 2004 population census, the three largest EU15 Member States are: Germany (21.6%), France (15.8%), and the UK (15.8%).[243]

1757. In *per capita* terms, the three largest consumers are: Luxembourg, Ireland, and Sweden in IO95 gasoline and Luxembourg, Austria, and Spain in diesel.

[243] The comparative analysis of these fuels *per capita* consumption across the EU15 as well as of the respective import and export degrees is detailed in Section 6.3.1.1 above.

Appendix 3 – Complement to the econometric analysis of the asymmetry phenomenon

1758. To better understand the asymmetry phenomenon analysis, we detail in this Appendix 3 the way we derive the cumulative impulse response functions (IRF) related with the channels "Brent → Platts CIF" and "Platts CIF → APPBT" (section A3.1) and with the integrated channel "Brent → APPBT" (section A3.2). We further detail the test and respective results on the endogeneity in the relations between Brent and Platts CIF prices as well as between the Platts FOB and the NYMEX prices for gasoline (section A3.3). We conclude the appendix by presenting the IRF and corresponding 95% confidence intervals estimation results on the asymmetry phenomenon (section A3.4).

1759. As referred in the text (section 12.2.1), we present below the time evolution, over the considered period (2004-2008), in semester averages and overall in the period, of the differentials between the considered reference prices for refined products, Platts NWE and MED prices, in CIF and FOB terms, for both fuels and the 1-month NYMEX futures price for gasoline (see Table 86 below).

Table 86 – Differentials between Platts NWE and MED prices for diesel and gasoline, in CIF and FOB terms, and between the 1-month NYMEX futures and the Platts FOB (NWE and MED) prices for gasoline, semester averages over the period 2004-2008 (€ cts/lt)

	FOB NWE - FOB MED		CIF NWE - CIF MED		CIF NWE - FOB NWE		CIF MED - FOB MED		NYMEX - FOB (Gas.)	
	Diesel	Gasoline	Diesel	Gasoline	Diesel	Gasoline	Diesel	Gasoline	NWE	MED
S1-04	-0.55	0.28	-0.48	0.22	1.02	0.63	0.96	0.69	2.12	2.40
S2-04	-0.51	0.01	-0.40	-0.05	1.00	0.69	0.88	0.76	1.48	1.49
S1-05	-0.75	0.35	-0.65	0.27	1.05	0.73	0.95	0.80	2.41	2.76
S2-05	-0.45	1.02	-0.33	1.07	1.11	0.81	1.00	0.76	2.07	3.09
S1-06	-0.60	-0.26	-0.44	0.74	1.14	1.76	0.98	0.76	5.07	4.80
S2-06	-0.25	-0.04	-0.17	0.55	0.93	1.26	0.85	0.68	1.99	1.95
S1-07	-0.18	0.15	-0.10	0.62	1.10	1.28	1.02	0.81	2.68	2.84
S2-07	-0.33	0.06	-0.13	0.78	0.98	1.30	0.78	0.57	1.35	1.41
S1-08	-0.48	0.01	-0.42	0.25	0.98	0.89	0.92	0.65	2.56	2.56
S2-08	0.06	-0.17	0.07	0.03	1.02	0.94	1.01	0.74	1.40	1.23
Total	**-0.40**	**0.14**	**-0.31**	**0.45**	**1.03**	**1.03**	**0.94**	**0.72**	**2.31**	**2.45**

A3.1 IRF over the channels "Brent → Platts CIF" and "Platts CIF → APPBT"

1760. Formally, to understand the meaning of a cumulative impulse response function – which we denote in the text as here and henceforth, simply, by "IRF" –, as the ones we study, consider a co-integration based representation similar to models (12.1) and (12.2) in the text, but with no asymmetries in the adjustment to positive and negative shocks, namely

$$\Delta y_t = \alpha_0 + \sum_{j=1}^{K} \alpha_j \Delta y_{t-j} + \sum_{j=0}^{M} \beta_j \Delta x_{t-j} + \lambda(y_{t-1} - \phi_0 - \phi_1 x_{t-1}) + \xi_t, \qquad \text{(A3.1)}$$

where both Δy_t and Δx_t are stationary stochastic process, with co-integrated levels (y_t and x_t) as described by the inner expression associated with the λ coefficient and ξ_t is a white noise process, with mean zero and time-invariant variance, assumed uncorrelated with the remaining RHS terms.

1761. From this model, our aim is thus to derive the IRF of y_{t+k} to a one unit shock on x_t over the cumulative of k weeks which follow that shocks, for all integer $k \geq 0$.

1762. Since the above model (A3.1) is, in analogy with the ones considered in the text, stationary, it admits a so-called "infinite moving average" representation, denoted by MA(∞), of the type:[244]

$$\Delta y_t = \mu + \sum_{j=0}^{\infty} \varphi_j \Delta x_{t-j} + \varepsilon_t, \qquad \text{(A3.2)}$$

where μ is a finite constant term, ε_t is a (finite) MA(∞) filter of the white noise ξ_t in (A3.1) above, and the φ_j coefficients are expressed in terms of the α_j (for j > 0), β_j, and ϕ_1 in expression (A3.1).

1763. From this MA(∞) formulation, it results that the response of y_{t+j} to a one unit shock on x_t, *i.e.* the change in y_{t+j} (Δy_{t+j}) j weeks after the shock (Δx_t = 1), is given by:

$$\varphi_j = \partial \Delta y_{t+j} \Big/ \partial \Delta x_t \,, \qquad \text{(A3.3)}$$

where the symbol "∂" denotes the partial derivative.

---

[244] Any stationary representation, as the one in (A3.1), admits a MA(∞) Wold representation of the type in (A3.2) where, in particular, the coefficients $\{\varphi_j\}$ satisfy the second order moments ergodicity condition, namely $\sum_{(j \geq 0)} |\varphi_j| < \infty$, which ensures the convergence of the corresponding IRF (*v.g.*, Hamilton, J. D., 1994, pp. 46-47 and 118-119).

1764. The k[th] ordinate of the cumulative impulse response function (IRF) referred in the text correspond then to:

$$\Phi_k = \sum_{j=0}^{k} \varphi_j \qquad \text{(A3.4)}$$

with the sequence $\{\Phi_k;$ for all integer $k \geq 0\}$ representing thus the IRF of y_{t+k} to an initial one unit shock on x_t, for all integers (in case, number of weeks) $k \geq 0$.

1765. In the case of model (A3.1) above, *i.e.* of symmetric models (12.1) and (12.2) in the text, it can be shown that the IRF $\{\Phi_k;$ for all integer $k \geq 0\}$ is given by the following set of equations:[245]

$$\begin{aligned}
&\Phi_0 = \beta_0, \\
&\Phi_1 = \Phi_0 + \beta_1 + \lambda(\Phi_0 - \phi_1) + \alpha_1 \Phi_0, \\
&\Phi_2 = \Phi_1 + \beta_2 + \lambda(\Phi_1 - \phi_1) + \alpha_1(\Phi_1 - \Phi_0) + \alpha_2 \Phi_0, \\
&\ldots \\
&\Phi_k = \Phi_{k-1} + \beta_k + \lambda(\Phi_{k-1} - \phi_1) + \sum_{j=1}^{k-1} \alpha_j (\Phi_{k-j} - \Phi_{k-j-1}) + \alpha_k \Phi_0,
\end{aligned} \qquad \text{(A3.5)}$$

where the α_k and β_k coefficients are, under the formulations (12.1) and (12.2) in the text (subsection 12.2.3), set to zero for any $k > 5$.

A3.2 IRF over the integrated channel "Brent → APPBT"

1766. Let φ_j and ψ_j denote, respectively, the non cumulative impulse responses, j weeks after the initial shock, of Δc_{t+j} to Δb_t on the channel "Brent → Platts" and of Δp_{t+j} to Δc_t on the channel "Platts → APPBT", in terms of expressions (A3.2) and (A3.3) above. It is then straightforward to show that the non cumulative impulse response of the APPBT to the price for Brent, in the integrated channel "Brent → APPBT", *i.e.* the impulse Δp_{t+j} in response to $\Delta b_t = 1$, is given by:

$$\theta_j = \partial \Delta p_{it+j} \Big/ \partial \Delta b_t = \sum_{m=0}^{j} \varphi_m \psi_{j-m}. \qquad \text{(A3.6)}$$

whose cumulative over $j = 0, 1, 2, \ldots, k$, *i.e.* the first k weeks after the shock (for any integer $k \geq 0$), namely

[245] See Borenstein et al. (1997, Appendix), which also shows the way the asymmetric IRF to positive and negative shocks are derived, in an analogous way to the set of equations in (A3.5).

$$\Omega_k = \sum_{j=0}^{k} \theta_j \ , \qquad \text{(A3.7)}$$

is the k[th] ordinate of the IRF associated with the integrated channel "Brent → APPBT", discriminated per fuel and Member State, including the EU15 average.

1767. The IRF estimates, including those related with the channel "NYMEX → Platts FOB (NWE and MED) for gasoline", are computed on the basis of expressions above with the coefficients being replaced by their estimates, disentangled between possible asymmetric responses to positive and negative shocks, *i.e.* between the subscripts "+" and "-" respectively.[246] The 95% confidence intervals – denoted below by "CI (95%)" – are estimated by the means of the Normal asymptotic distribution, with this approximation being justified by the fact that for most regression residual components, the Jarque-Bera test is unable to reject the Normality of their distribution at the standard 95% probability level.[247]

A3.3 Endogeneity in the relation between international prices for crude (Brent) and for refined products (Platts)

1768. As referred in the text (in its subsection 12.2.2), we study the endogeneity in relations: *(i)* between the Platts FOB (NWE and MED) and the 1-month NYMEX futures prices for gasoline and *(ii)* between the Brent and the Platts CIF prices for both fuels, by the means of the bivariate Granger causality test.

1769. The bivariate Granger causality test assesses whether the present and past of a time series (x_t) can help explain the present / future of another time series (y_t). In case the available information on x_t (i.e., its past and present) contributes to explain the present / future of y_t, x_t is said to Granger cause y_t.

1770. Formally, the bivariate Granger causality test can be described in terms of the following linear stationary representation:

$$\Delta y_t = \alpha_0 + \sum_{j=1}^{M} \alpha_j \Delta y_{t-j} + \sum_{j=0}^{K} \beta_j \Delta x_{t-j} + \xi_t , \qquad \text{(A3.8)}$$

[246] Estimation is performed in EViews 6 by OLS, using White's heteroscedastic error correction for a more consistent estimate of the regression coefficient standard errors.

[247] It is worth noting that even the residual components which make exception to these test results have an empirical distribution which resembles the Normal. The Normality approximation is, actually, consistent with the time length of our samples (261 weeks) under the so-called "Central Limit Theorem" (*v.g.*, Hamilton, J. D., 1994, 185-186). We further note that the application of the Bootstrapping methodology for the estimation of these confidence intervals would surely be more cumbersome and not necessarily of better quality given the validity of the Normal approximation in the present analysis.

where ξ_t is a white noise of zero mean, time-invariant variance, and which is presumed uncorrelated with the RHS variables.

1771. Under this representation, where K may be finite, we have that x_t does not Granger cause y_t in case all β_j are zero. The Granger causality test consists then in testing the joint null hypothesis that $\beta_0 = \beta_1 = \ldots = \beta_K = 0$.[248]

1772. In the assessment of endogeneity in the above referred relations, we disentangle between: *(i)* the original daily series, in US$ and in € (cts/lt) and *(ii)* the weekly averages, as considered in the text, in € cts/lt.

1773. These Granger causality test results are summarized in Table 87 below where we present the probability values of rejection of the null hypothesis of no causality, where a value above 0.05 (in bold and shadow areas) indicates the (temporary) non rejection of that null hypothesis or, equivalently, evidence in favour of non causality from the series in columns on the series in rows.

1774. The cases considered in our analysis (subsection 12.2.2) are in yellow colour, namely:

(i) The possible causality from Platts CIF (NWE and MED) prices for diesel and gasoline over the price for Brent, relevant for the analysis of the international channel "Brent → Platts CIF";

(ii) The endogeneity (or two-sided causality) in the relation between the 1-month NYMEX futures price for gasoline and the Brent and WTI prices; and

(iii) The possible causality from the Platts FOB (NWE and MED) prices over the 1-month NYMEX futures price for gasoline, relevant for the analysis of the gasoline international channel "NYMEX → Platts FOB".

1775. Results reveal that (see Table 87 below):

(i) In general, the number of non causality cases increases (or we loose on endogeneity) with the conversion from US$ to € and with the time aggregation effect, from (the original) daily series to (the considered) weekly averages;

(ii) Endogeneity (or two-sided causality) is confirmed in the international relations between crude prices (Brent and WTI) and between these latter and the 1-month NYMEX futures price for gasoline;

(iii) There is no causality (as suggested in the June 2008 Report, section 4.2) from the Platts FOB (NWE and MED) prices for gasoline on the 1-month NYMEX future price for that product, but only in the opposite direction

[248] In OLS-type regressions, as the ones considered herein, this test has an asymptotic distribution $\chi^2(K)$, as described, *v.g.*, in Hamilton (1994, pp. 302-309).

"NYMEX → Platts FOB for gasoline", in all the considered cases, including the weekly averages in € cts/lt;

(iv) There is no causality (as desired) from the Platts CIF (NWE and MED) prices for both fuels on both the prices for Brent and WTI, but only in the opposite direction "Crude (Brent & WTI) → Platts CIF for both fuels", in all the considered cases, including the weekly averages in € cts/lt (as considered in our analysis, Chapter 12 and section A3.4 below);

1776. It is also interesting to note, although this reflexion goes beyond the scope of the present analysis, the absence of endogeneity in the relations between the original daily series on the US$/€ exchange rate and the considered international prices for crude and refined products, with the exception of the Platts FOB (NWE and MED) and Platts CIF NWE for gasoline where the causality is one-sided from these prices over the US$/€ exchange rate.

1777. These latter causality relations disappear when the series are considered in weekly averages, in € cts/lt, with the exceptions of Platts CIF NWE price for diesel where there is evidence of causality in the direction "US$/€ → Platts CIF NWE for diesel" and of WTI price where there is evidence of causality in the opposite direction "WTI → US$/€".

Table 87 – Bivariate Granger causality test results – probability values of rejection of the null hypothesis of non causality, *i.e.* for all values below 0.05 (at the 95% standard probability level) – related with the original daily series, in US$ and in € (cts/lt), as well as with the series considered in the analysis, weekly averages in € cts/lt

Original daily series (US $ cts/lt)

		Crude		Platts FOB NWE		Platts FOB MED		Platts CIF NWE		Platts CIF MED		NYMEX	Rate
		Brent	WTI	Diesel	Gasoline	Diesel	Gasoline	Diesel	Gasoline	Diesel	Gasoline	Gasoline	US$/€
Crude	Brent	X	0.0000	0.0169	0.0046	0.0070	0.0042	0.0154	0.0003	0.0069	0.0042	0.0004	0.0032
	WTI	0.0000	X	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0014	0.0000
Platts FOB NWE	Diesel	**0.5208**	0.0090	X	0.0105	0.0349	0.0163	**0.8047**	0.0358	0.0258	0.0163	0.0432	0.0009
	Gasoline	**0.2278**	0.0000	0.0059	X	0.0186	**0.7932**	0.0060	**0.6683**	0.0149	**0.2461**	**0.1547**	0.0169
Platts FOB MED	Diesel	**0.3631**	0.0308	**0.0872**	0.0145	X	0.0252	0.0462	0.0402	**0.1522**	0.0183	**0.0781**	0.0005
	Gasoline	0.0371	0.0000	0.0186	**0.4413**	0.0147	X	0.0091	0.0107	0.0120	**0.5225**	**0.1547**	0.0051
Platts CIF NWE	Diesel	**0.5249**	0.0086	**0.8052**	0.0105	0.0479	0.0271	X	0.0359	0.0353	0.0153	0.0411	0.0010
	Gasoline	0.0306	0.0004	0.0050	**0.6236**	0.0090	0.2143	0.0053	X	0.0068	**0.7955**	0.0194	0.0051
Platts CIF MED	Diesel	**0.3817**	0.0318	**0.1228**	0.0149	**0.1695**	0.0260	**0.0953**	0.0397	X	0.0190	**0.0701**	0.0005
	Gasoline	**0.0781**	0.0001	0.0107	**0.3602**	0.0169	**0.7321**	0.0115	**0.6432**	0.0138	X	0.0409	0.0048
NYMEX	Gasoline	0.0000	0.0231	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	X	0.0003
Rate	US$/€	0.0254	0.0058	0.0215	**0.1413**	0.0113	**0.0526**	0.0209	**0.1802**	0.0094	0.0422	**0.4777**	X

Original daily series (€ cts/lt)

		Crude		Platts FOB NWE		Platts FOB MED		Platts CIF NWE		Platts CIF MED		NYMEX	Rate
		Brent	WTI	Diesel	Gasoline	Diesel	Gasoline	Diesel	Gasoline	Diesel	Gasoline	Gasoline	US$/€
Crude	Brent	X	0.0000	0.0380	0.0012	0.0059	0.0137	0.0341	0.0199	0.0046	0.0181	0.0053	0.0062
	WTI	0.0000	X	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0006	0.0000
Platts FOB NWE	Diesel	**0.5189**	0.0227	X	**0.1203**	**0.3491**	**0.2101**	**0.7824**	**0.3247**	**0.2749**	**0.1699**	**0.0820**	0.0031
	Gasoline	0.0368	0.0001	0.0369	X	**0.0738**	**0.0985**	0.0396	**0.7930**	**0.0571**	**0.1318**	**0.0763**	**0.0514**
Platts FOB MED	Diesel	**0.1899**	0.0442	**0.4332**	**0.0766**	X	**0.1152**	**0.2322**	**0.1873**	**0.6050**	**0.0991**	**0.0880**	0.0019
	Gasoline	0.0480	0.0001	0.0367	**0.0584**	**0.0749**	X	0.0429	**0.5388**	**0.0598**	**0.5657**	0.0184	0.0160
Platts CIF NWE	Diesel	**0.5205**	0.0202	**0.8077**	**0.1219**	**0.3536**	**0.2093**	X	**0.3330**	**0.3383**	**0.1679**	**0.0773**	0.0033
	Gasoline	**0.2224**	0.0006	0.0429	**0.6347**	0.0465	**0.9347**	0.0445	X	0.0348	**0.8982**	0.0084	0.0198
Platts CIF MED	Diesel	**0.1896**	0.0427	**0.5530**	**0.0780**	**0.5997**	**0.1189**	**0.4538**	**0.1843**	X	**0.1024**	**0.0813**	0.0016
	Gasoline	**0.0857**	0.0001	**0.0532**	**0.1403**	**0.0881**	**0.7435**	**0.0616**	**0.6043**	**0.0714**	X	0.0204	0.0148
NYMEX	Gasoline	0.0000	0.0232	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	X	0.0011
Rate	US$/€	0.0155	0.0010	0.0059	**0.2528**	0.0016	**0.1481**	0.0049	**0.3563**	0.0013	**0.1396**	**0.7003**	X

Weekly averages in € cts/lt, as considered in the analysis

		Crude		Platts FOB NWE		Platts FOB MED		Platts CIF NWE		Platts CIF MED		NYMEX	Rate
		Brent	WTI	Diesel	Gasoline	Diesel	Gasoline	Diesel	Gasoline	Diesel	Gasoline	Gasoline	US$/€
Crude	Brent	X	0.0000	**0.0787**	0.0088	**0.0935**	0.0138	**0.0772**	0.0107	**0.0931**	0.0085	**0.1142**	**0.3066**
	WTI	0.0000	X	0.0020	0.0016	0.0000	0.0017	0.0016	0.0019	0.0005	0.0011	0.0335	0.0000
Platts FOB NWE	Diesel	**0.7349**	**0.9224**	X	**0.6051**	**0.0613**	**0.3715**	**0.4978**	**0.7054**	**0.0801**	**0.3551**	**0.3606**	**0.1177**
	Gasoline	0.0037	0.0008	0.0097	X	0.0096	**0.0985**	**0.0993**	**0.9110**	0.0177	0.0246	**0.0994**	**0.2291**
Platts FOB MED	Diesel	**0.9665**	**0.6513**	**0.1970**	**0.6646**	X	**0.4766**	**0.0621**	**0.7773**	**0.1171**	**0.4446**	**0.2806**	**0.1203**
	Gasoline	0.0178	0.0015	0.0154	**0.1170**	0.0348	X	0.0157	**0.4372**	0.0252	**0.2354**	**0.1430**	**0.2918**
Platts CIF NWE	Diesel	**0.7197**	**0.9352**	**0.5345**	**0.5853**	**0.0619**	**0.3419**	X	**0.6845**	**0.1402**	**0.3261**	**0.3383**	**0.1295**
	Gasoline	**0.2224**	0.0019	0.0190	**0.9291**	0.0347	**0.5359**	0.0188	X	0.0258	**0.3471**	**0.0644**	**0.2795**
Platts CIF MED	Diesel	**0.9585**	**0.7273**	**0.5632**	**0.7075**	**0.1468**	**0.5264**	**0.4455**	**0.8039**	X	**0.4910**	**0.2587**	**0.1312**
	Gasoline	**0.0857**	0.0024	0.0167	**0.2337**	0.0363	**0.3096**	0.0167	**0.5361**	0.0262	X	**0.1202**	**0.3021**
NYMEX	Gasoline	0.0000	0.0063	0.0016	0.0000	0.0000	0.0000	0.0016	0.0000	0.0018	0.0000	X	**0.3407**
Rate	US$/€	**0.3535**	**0.1861**	**0.0559**	**0.1639**	**0.0510**	**0.1564**	0.0470	**0.1717**	**0.0504**	**0.1742**	**0.1376**	X

A3.4 IRF and 95% confidence interval estimates on the analysis of the asymmetry phenomenon in the EU15

1778. In analogy with the text (section 12.3), we present these estimation results disentangled between the types of channels considered in the analysis: the international channels "Brent → Platts CIF" and "NYMEX → Platts FOB (NWE and MED) for gasoline" (section A3.4.1), the domestic channels "Platts CIF → APPBT", per fuel (diesel and IO95 gasoline) and per EU15 Member State, including the EU15 average (subsection A3.4.2), and the integrated domestic channels "Brent → APPBT" (subsection A3.4.3).

1779. IRF estimates are further disentangled between IRF to positive shocks ("Rise") and to negative shocks ("Fall"), with each being associated with the lower (Inf.) and the upper (Sup.) limits of the corresponding 95% confidence interval, "CI (95%)" (see Illustrations below).

1780. Bold values in the Illustrations Tables indicate, in case of the upper (Sup.) limit of the CI (95%) associated with the tables "Rise" or "Fall", the first value not below 1 which is related with the time delay at which the corresponding adjustment process (or IRF), to a rise or a fall, reaches its steady state. In the cases of overshooting, bold values in the column "Inf." of the table "Rise" indicate the delays over which this phenomenon lasts.

1781. Analogously, in these Illustrations charts, the vertical coloured lines, orange and green in the first chart (regarding diesel) and pink and blue in the second (regarding gasoline), indicate the time delay at which the adjustment processes to, respectively, a rise and a fall reach the steady state. There is evidence in favour of the asymmetry phenomenon in the adjustment delay in case the orange / pink lines appear before the green / blue lines. A single vertical dark line indicates the same delay of adjustment to rises and falls, *i.e.* no asymmetry in the delay of adjustment.

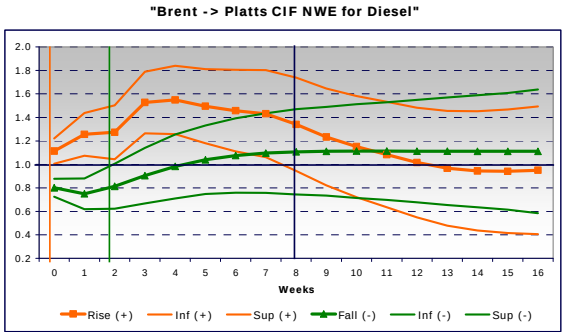
1782. In the cases consistent with the overshooting phenomenon, the (dark) bold vertical lines indicate the period of time over which this phenomenon lasts.

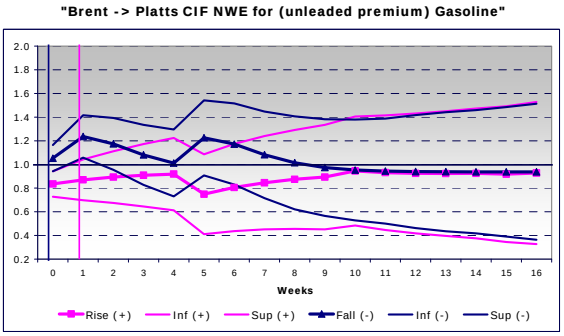
1783. The zero and unit values in the ordinate axis – with the value of 1 being associated with the steady state – are also indicated in the charts (subsections A3.4.2 and A3.4.3) with corresponding horizontal (continuous) lines.

A3.4.1. International channels "Brent → Platts CIF for both fuels" and "NYMEX → Platts FOB for gasoline"

1784. We hereby summarize (Illustrations below) the estimates and corresponding CI (95%) of the IRF related with the international channels "Brent → Platts CIF (NWE and MED) for both fuels" and "NYMEX → Platts FOB (NWE and MED) for gasoline".

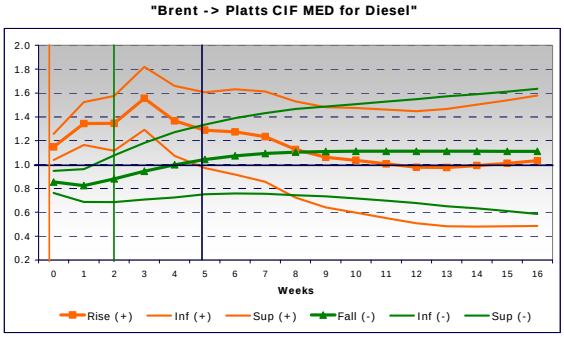
Illustration 12 – International channel "Brent → Platts CIF NWE": IRF (in cts/lt) and corresponding CI (95%) estimates for diesel and IO95 gasoline, disentangled between a 1 cts/lt "Rise" and "Fall" of the price for Brent

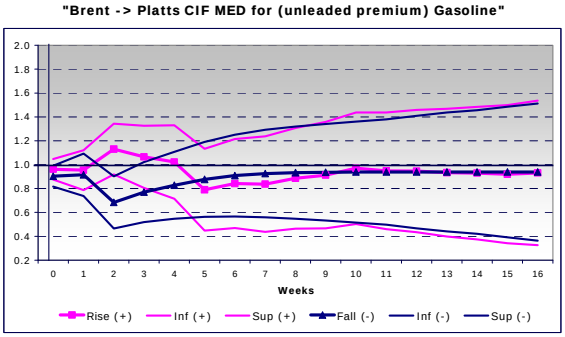




	Brent -> Platts CIF NWE											
	Diesel						Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	1.114	**1.006**	**1.221**	0.802	0.725	0.878	0.836	0.728	0.943	1.053	0.942	**1.165**
1	1.255	**1.074**	**1.437**	0.750	0.619	0.881	0.870	0.698	**1.043**	1.237	1.058	1.416
2	1.273	**1.044**	**1.502**	0.814	0.622	**1.006**	0.894	0.674	1.113	1.174	0.955	1.394
3	1.527	**1.265**	**1.790**	0.904	0.668	1.140	0.909	0.646	1.172	1.081	0.827	1.334
4	1.548	**1.258**	**1.839**	0.983	0.711	1.255	0.919	0.613	1.225	1.013	0.730	1.296
5	1.495	**1.179**	**1.810**	1.040	0.749	1.330	0.748	0.411	1.086	1.225	0.908	1.542
6	1.458	**1.110**	**1.805**	1.076	0.759	1.393	0.806	0.436	1.175	1.172	0.829	1.515
7	1.432	**1.061**	**1.803**	1.096	0.758	1.435	0.846	0.452	1.240	1.082	0.716	1.448
8	1.341	0.944	1.738	1.107	0.744	1.470	0.874	0.456	1.292	1.014	0.621	1.407
9	1.234	0.821	1.646	1.112	0.733	1.490	0.894	0.453	1.335	0.974	0.566	1.382
10	1.152	0.720	1.583	1.113	0.714	1.512	0.945	0.484	1.406	0.953	0.527	1.380
11	1.083	0.634	1.533	1.113	0.697	1.529	0.931	0.447	1.414	0.944	0.500	1.388
12	1.016	0.549	1.483	1.113	0.677	1.548	0.925	0.418	1.431	0.940	0.462	1.418
13	0.967	0.478	1.455	1.112	0.654	1.570	0.923	0.396	1.450	0.939	0.436	1.442
14	0.945	0.437	1.452	1.112	0.635	1.589	0.924	0.376	1.473	0.938	0.417	1.459
15	0.941	0.415	1.467	1.111	0.614	1.609	0.918	0.345	1.491	0.938	0.391	1.486
16	0.950	0.406	1.493	1.111	0.585	1.638	0.928	0.327	1.529	0.938	0.363	1.513
17	0.972	0.408	1.536	1.111	0.561	1.661	0.933	0.306	1.560	0.938	0.343	1.533
18	1.005	0.423	1.587	1.111	0.544	1.679	0.935	0.288	1.582	0.938	0.329	1.548
19	1.043	0.444	1.641	1.111	0.528	1.694	0.936	0.265	1.607	0.938	0.310	1.566
20	1.080	0.461	1.698	1.111	0.507	1.715	0.938	0.247	1.629	0.938	0.284	1.593

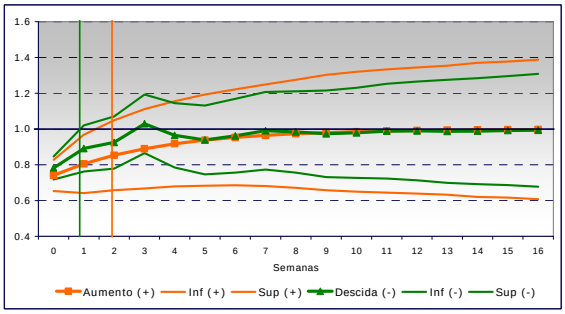
Illustration 13 – International channel "Brent → Platts CIF MED": IRF (in cts/lt) and corresponding CI (95%) estimates for diesel and IO95 gasoline, disentangled between a 1 cts/lt "Rise" and "Fall" of the price for Brent

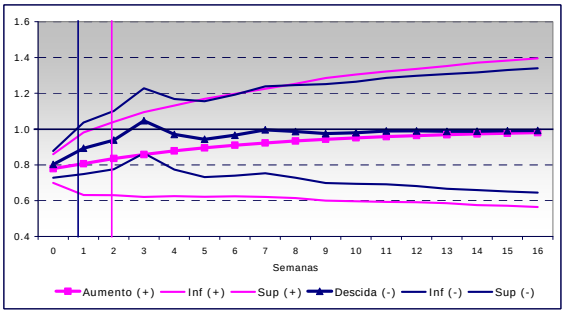




	Brent -> Platts CIF MED											
	Diesel						Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	1.148	**1.038**	**1.258**	0.854	0.761	0.947	0.962	0.876	**1.047**	0.904	0.816	0.991
1	1.344	**1.164**	**1.524**	0.825	0.687	0.962	0.954	0.787	1.120	0.915	0.738	**1.092**
2	1.346	**1.117**	**1.576**	0.881	0.685	**1.076**	1.131	0.918	1.343	0.683	0.465	0.902
3	1.556	**1.292**	**1.819**	0.944	0.707	1.182	1.065	0.806	1.325	0.770	0.518	1.022
4	1.367	**1.073**	**1.661**	0.998	0.725	1.272	1.022	0.715	1.330	0.827	0.547	1.107
5	1.289	0.971	1.607	1.043	0.751	1.335	0.790	0.448	1.132	0.877	0.563	1.191
6	1.274	0.917	1.631	1.074	0.758	1.390	0.842	0.469	1.215	0.908	0.566	1.251
7	1.234	0.856	1.613	1.093	0.755	1.432	0.837	0.437	1.238	0.925	0.558	1.292
8	1.126	0.722	1.531	1.104	0.743	1.466	0.885	0.464	1.307	0.933	0.547	1.320
9	1.062	0.642	1.482	1.110	0.733	1.486	0.913	0.467	1.358	0.937	0.532	1.341
10	1.036	0.597	1.474	1.112	0.716	1.508	0.971	0.503	1.438	0.938	0.515	1.361
11	1.007	0.552	1.461	1.112	0.697	1.528	0.949	0.460	1.437	0.938	0.498	1.379
12	0.977	0.508	1.447	1.112	0.677	1.547	0.946	0.433	1.459	0.938	0.467	1.410
13	0.975	0.484	1.467	1.112	0.652	1.572	0.933	0.399	1.468	0.938	0.440	1.437
14	0.992	0.481	1.503	1.112	0.634	1.590	0.929	0.374	1.484	0.938	0.420	1.456
15	1.010	0.482	1.539	1.111	0.611	1.612	0.920	0.341	1.499	0.938	0.392	1.485
16	1.032	0.485	1.579	1.111	0.586	1.636	0.931	0.326	1.536	0.938	0.364	1.513
17	1.062	0.498	1.626	1.111	0.563	1.660	0.934	0.300	1.568	0.938	0.341	1.536
18	1.092	0.509	1.675	1.111	0.540	1.682	0.938	0.287	1.589	0.938	0.326	1.551
19	1.118	0.518	1.718	1.111	0.521	1.701	0.939	0.263	1.615	0.938	0.305	1.572
20	1.138	0.519	1.758	1.111	0.499	1.723	0.941	0.244	1.638	0.938	0.281	1.596

Illustration 14 – International channel "NYMEX → Platts FOB (NWE and MED) for gasoline": IRF (in cts/lt) and corresponding CI (95%) estimates for diesel and IO95 gasoline, disentangled between a 1 cts/lt "Rise" and "Fall" of the NYMEX price for gasoline





	NYMEX -> Platts FOB (unleaded premium) Gasoline											
	Zone NWE						Zone MED					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.741	0.653	0.828	0.782	0.718	0.846	0.779	0.700	0.859	0.803	0.728	0.878
1	0.805	0.642	0.968	0.891	0.763	**1.020**	0.806	0.631	0.981	0.893	0.749	**1.037**
2	0.854	0.658	**1.049**	0.925	0.779	1.071	0.836	0.631	**1.040**	0.938	0.776	1.101
3	0.890	0.668	1.112	1.029	0.865	1.193	0.858	0.622	1.094	1.047	0.865	1.228
4	0.917	0.680	1.155	0.965	0.785	1.145	0.878	0.626	1.131	0.971	0.773	1.168
5	0.938	0.683	1.193	0.939	0.746	1.132	0.895	0.622	1.169	0.943	0.731	1.156
6	0.953	0.685	1.221	0.962	0.756	1.168	0.910	0.624	1.196	0.966	0.739	1.192
7	0.965	0.681	1.249	0.991	0.774	1.207	0.923	0.620	1.225	0.996	0.753	1.238
8	0.974	0.671	1.276	0.984	0.756	1.211	0.934	0.614	1.253	0.987	0.728	1.246
9	0.980	0.658	1.303	0.973	0.731	1.215	0.943	0.601	1.285	0.975	0.698	1.252
10	0.985	0.650	1.320	0.978	0.726	1.231	0.951	0.597	1.306	0.979	0.694	1.265
11	0.989	0.644	1.333	0.988	0.724	1.253	0.958	0.594	1.323	0.989	0.692	1.286
12	0.992	0.639	1.344	0.989	0.713	1.266	0.964	0.591	1.336	0.990	0.682	1.298
13	0.994	0.633	1.355	0.987	0.698	1.275	0.969	0.586	1.352	0.987	0.666	1.307
14	0.995	0.621	1.370	0.988	0.692	1.284	0.973	0.575	1.372	0.988	0.660	1.316
15	0.996	0.616	1.377	0.992	0.687	1.297	0.977	0.572	1.383	0.991	0.652	1.331
16	0.997	0.608	1.387	0.993	0.677	1.309	0.980	0.565	1.396	0.992	0.645	1.340
17	0.998	0.603	1.393	0.993	0.672	1.314	0.983	0.562	1.404	0.992	0.638	1.346
18	0.998	0.595	1.402	0.993	0.664	1.322	0.986	0.554	1.417	0.993	0.630	1.356
19	0.999	0.584	1.413	0.995	0.658	1.331	0.988	0.541	1.434	0.994	0.624	1.364
20	0.999	0.577	1.421	0.996	0.651	1.341	0.989	0.533	1.446	0.995	0.609	1.380

A3.4.2. Domestic channels "Platts CIF → APPBT"

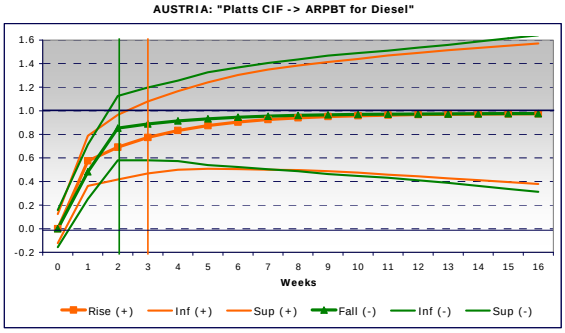
1785. We present below the IRF and corresponding CI (95%) estimates on the domestic channels "Platts CIF → APPBT", per fuel (diesel and IO95 gasoline) and for each one of the EU15 Member States, including the EU15 average, disentangled between a 1 cts/lt rise and fall of those Platts prices.

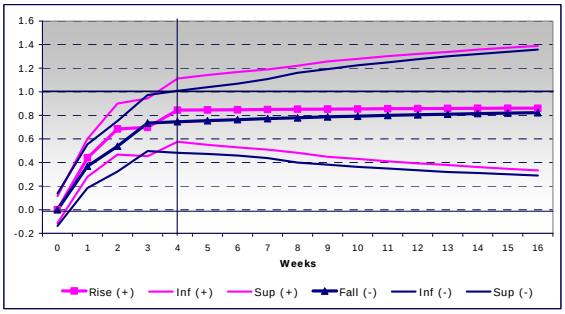
1786. As referred in the text (subsection 12.3.2), EU15 Member States are divided between the two European Platts zones as follows:

(i) NWE: Sweden, Finland, UK, Ireland, Denmark, Belgium, Netherlands, Luxembourg, Germany, Portugal, Spain with a 33.8% weight, France with a 66.5% weight, and the EU15 average with weights of 69.4% and 62.9% for IO95 gasoline and diesel respectively; and

(ii) MED: Italy, Greece, Austria, Spain with a 66.2% weight, France with a 33.5% weight, and the EU15 average with weights of 30.6% and 37.1% for IO95 gasoline and diesel respectively.

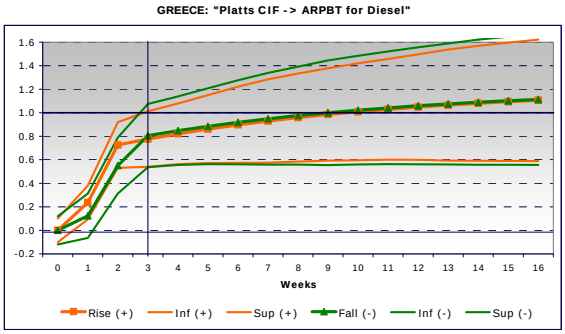
Illustration 15 – Austria: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Platts CIF → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective Platts CIF price

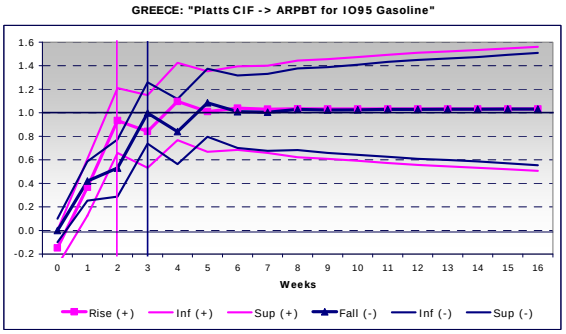




	AUSTRIA (MED)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.123	0.123	0.000	-0.158	0.158	0.000	-0.114	0.114	0.000	-0.139	0.139
1	0.575	0.363	0.788	0.483	0.252	0.713	0.440	0.279	0.601	0.369	0.184	0.555
2	0.692	0.417	0.966	0.853	0.580	**1.127**	0.684	0.467	0.902	0.539	0.324	0.753
3	0.774	0.468	**1.080**	0.889	0.580	1.199	0.699	0.454	0.944	0.735	0.498	0.973
4	0.833	0.499	1.167	0.915	0.573	1.256	0.844	0.576	**1.112**	0.746	0.483	**1.009**
5	0.875	0.508	1.241	0.933	0.539	1.326	0.846	0.550	1.142	0.755	0.472	1.038
6	0.905	0.505	1.304	0.946	0.523	1.368	0.848	0.529	1.168	0.764	0.460	1.069
7	0.926	0.501	1.350	0.955	0.504	1.406	0.850	0.509	1.191	0.773	0.438	1.108
8	0.941	0.497	1.384	0.961	0.487	1.435	0.852	0.483	1.221	0.780	0.399	1.161
9	0.951	0.489	1.414	0.966	0.464	1.468	0.853	0.448	1.259	0.787	0.382	1.192
10	0.959	0.477	1.441	0.969	0.448	1.491	0.855	0.430	1.280	0.794	0.363	1.225
11	0.964	0.459	1.470	0.972	0.432	1.511	0.856	0.410	1.302	0.800	0.349	1.250
12	0.968	0.445	1.491	0.973	0.411	1.536	0.858	0.393	1.322	0.805	0.335	1.276
13	0.971	0.427	1.515	0.974	0.389	1.560	0.859	0.379	1.338	0.810	0.320	1.301
14	0.973	0.412	1.533	0.975	0.363	1.588	0.860	0.362	1.358	0.815	0.311	1.320
15	0.974	0.396	1.552	0.976	0.337	1.615	0.861	0.347	1.374	0.820	0.300	1.339
16	0.975	0.380	1.570	0.976	0.312	1.640	0.862	0.333	1.390	0.824	0.290	1.357
17	0.976	0.363	1.588	0.977	0.288	1.665	0.863	0.319	1.406	0.827	0.279	1.375
18	0.976	0.348	1.605	0.977	0.265	1.689	0.863	0.305	1.421	0.831	0.269	1.392
19	0.977	0.332	1.621	0.977	0.243	1.711	0.864	0.292	1.436	0.834	0.259	1.409
20	0.977	0.317	1.637	0.977	0.221	1.734	0.865	0.279	1.450	0.837	0.249	1.425

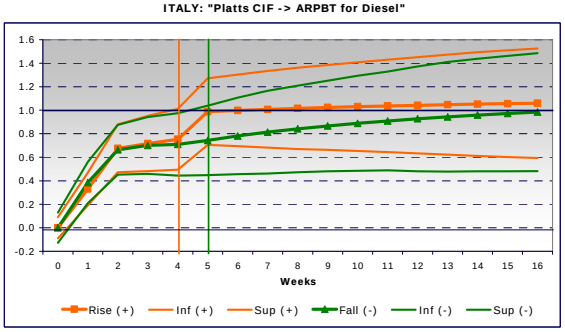
Illustration 16 – Greece: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Platts CIF → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective Platts CIF price

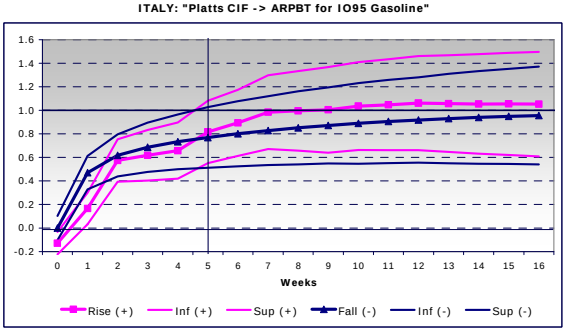




	GREECE (MED)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.101	0.101	0.000	-0.119	0.119	-0.147	-0.297	0.003	0.000	-0.100	0.100
1	0.238	0.094	0.381	0.125	-0.064	0.313	0.367	0.126	0.608	0.420	0.254	0.586
2	0.726	0.533	0.919	0.551	0.313	0.789	0.934	0.659	**1.210**	0.531	0.288	0.773
3	0.776	0.540	**1.012**	0.805	0.536	**1.074**	0.841	0.533	1.149	0.998	0.738	**1.258**
4	0.821	0.563	1.079	0.847	0.556	1.138	1.096	0.768	1.425	0.840	0.564	1.117
5	0.861	0.572	1.150	0.885	0.562	1.207	1.010	0.669	1.352	1.085	0.796	1.374
6	0.897	0.574	1.221	0.918	0.561	1.275	1.040	0.685	1.394	1.009	0.701	1.317
7	0.930	0.575	1.284	0.949	0.559	1.338	1.030	0.660	1.400	1.004	0.677	1.331
8	0.959	0.584	1.333	0.976	0.559	1.393	1.033	0.623	1.444	1.030	0.683	1.376
9	0.985	0.592	1.377	1.000	0.555	1.445	1.032	0.608	1.456	1.023	0.659	1.387
10	1.008	0.596	1.420	1.022	0.560	1.484	1.033	0.593	1.473	1.025	0.642	1.408
11	1.029	0.601	1.457	1.041	0.562	1.520	1.033	0.573	1.492	1.029	0.625	1.432
12	1.048	0.600	1.496	1.059	0.561	1.557	1.033	0.556	1.509	1.029	0.608	1.449
13	1.065	0.592	1.537	1.075	0.561	1.589	1.033	0.544	1.521	1.030	0.599	1.460
14	1.080	0.591	1.569	1.089	0.557	1.621	1.033	0.533	1.533	1.031	0.587	1.474
15	1.093	0.591	1.596	1.101	0.557	1.646	1.033	0.519	1.546	1.031	0.570	1.492
16	1.106	0.590	1.622	1.113	0.556	1.670	1.033	0.506	1.559	1.031	0.554	1.509
17	1.117	0.588	1.646	1.123	0.554	1.692	1.033	0.493	1.572	1.032	0.538	1.525
18	1.126	0.585	1.668	1.132	0.551	1.713	1.033	0.480	1.585	1.032	0.523	1.541
19	1.135	0.581	1.689	1.140	0.548	1.733	1.033	0.468	1.598	1.032	0.508	1.556
20	1.143	0.577	1.709	1.148	0.544	1.752	1.033	0.456	1.610	1.032	0.494	1.571

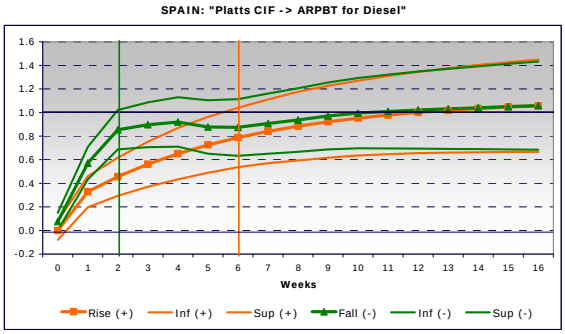
Illustration 17 – Italy: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Platts CIF → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective Platts CIF price

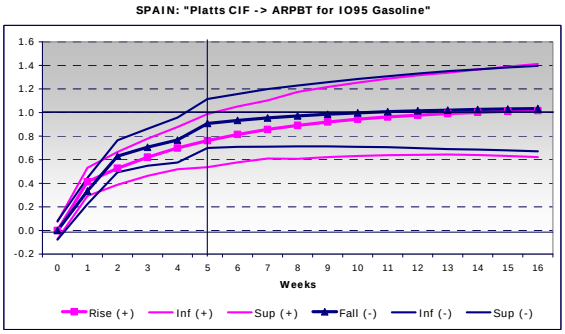




	ITALY (MED)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.089	0.089	0.000	-0.128	0.128	-0.129	-0.224	-0.033	0.000	-0.102	0.102
1	0.330	0.190	0.470	0.385	0.210	0.560	0.166	0.033	0.300	0.471	0.328	0.613
2	0.676	0.473	0.879	0.664	0.452	0.875	0.574	0.393	0.754	0.618	0.439	0.797
3	0.717	0.482	0.951	0.701	0.459	0.942	0.618	0.403	0.832	0.686	0.477	0.895
4	0.753	0.495	**1.012**	0.709	0.444	0.974	0.657	0.419	0.896	0.732	0.500	0.965
5	0.988	0.705	1.271	0.743	0.447	**1.039**	0.817	0.552	**1.082**	0.769	0.511	**1.027**
6	0.998	0.695	1.302	0.782	0.456	1.107	0.894	0.612	1.175	0.801	0.524	1.077
7	1.008	0.681	1.334	0.814	0.461	1.166	0.984	0.672	1.297	0.828	0.535	1.120
8	1.016	0.670	1.362	0.841	0.473	1.210	0.995	0.657	1.333	0.851	0.540	1.162
9	1.024	0.663	1.384	0.866	0.481	1.251	1.004	0.641	1.368	0.871	0.549	1.194
10	1.031	0.654	1.407	0.889	0.484	1.293	1.035	0.662	1.408	0.889	0.546	1.232
11	1.037	0.644	1.429	0.909	0.489	1.329	1.047	0.662	1.433	0.904	0.551	1.258
12	1.042	0.633	1.452	0.927	0.482	1.373	1.061	0.661	1.461	0.918	0.555	1.281
13	1.047	0.622	1.473	0.944	0.478	1.409	1.057	0.647	1.468	0.929	0.550	1.309
14	1.052	0.611	1.493	0.959	0.480	1.438	1.054	0.631	1.477	0.939	0.546	1.333
15	1.056	0.602	1.510	0.972	0.481	1.463	1.055	0.622	1.489	0.948	0.544	1.352
16	1.060	0.594	1.526	0.984	0.482	1.486	1.053	0.609	1.496	0.956	0.541	1.371
17	1.063	0.586	1.541	0.995	0.482	1.509	1.050	0.596	1.505	0.962	0.537	1.387
18	1.066	0.577	1.555	1.005	0.481	1.529	1.045	0.581	1.509	0.968	0.533	1.403
19	1.069	0.569	1.569	1.014	0.479	1.549	1.041	0.567	1.515	0.973	0.528	1.418
20	1.071	0.560	1.582	1.022	0.476	1.567	1.037	0.554	1.521	0.977	0.523	1.432

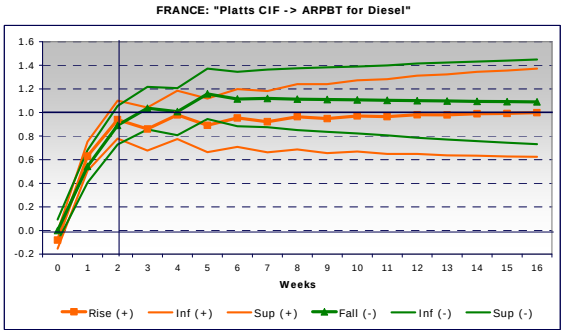
Illustration 18 – Spain: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Platts CIF → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective Platts CIF price

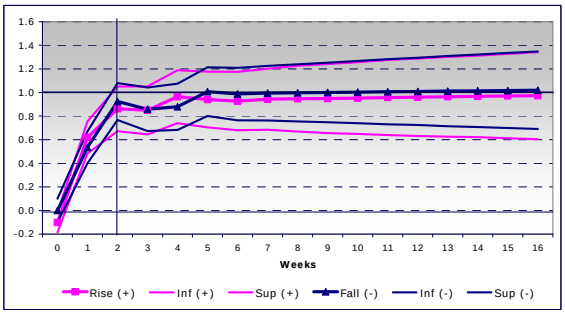




	SPAIN (66.1% MED & 33.9% NWE)											
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.079	0.079	0.076	0.002	0.150	0.000	-0.073	0.073	0.000	-0.079	0.079
1	0.329	0.197	0.461	0.572	0.434	0.710	0.412	0.293	0.532	0.335	0.223	0.447
2	0.456	0.295	0.617	0.855	0.687	**1.022**	0.527	0.389	0.666	0.630	0.494	0.765
3	0.562	0.371	0.753	0.896	0.706	1.086	0.622	0.464	0.779	0.706	0.549	0.862
4	0.651	0.434	0.869	0.920	0.711	1.130	0.699	0.519	0.878	0.768	0.577	0.959
5	0.726	0.489	0.962	0.878	0.651	1.105	0.762	0.537	**0.987**	0.908	0.700	**1.116**
6	0.789	0.536	**1.041**	0.874	0.634	1.114	0.814	0.578	1.051	0.934	0.709	1.158
7	0.841	0.571	1.111	0.907	0.652	1.162	0.857	0.610	1.103	0.955	0.710	1.199
8	0.885	0.593	1.177	0.937	0.667	1.206	0.892	0.608	1.175	0.972	0.714	1.230
9	0.922	0.617	1.227	0.972	0.688	1.255	0.920	0.623	1.217	0.986	0.714	1.257
10	0.953	0.635	1.271	0.995	0.697	1.293	0.944	0.633	1.255	0.998	0.709	1.286
11	0.979	0.647	1.311	1.009	0.696	1.323	0.963	0.638	1.288	1.007	0.706	1.308
12	1.001	0.657	1.345	1.022	0.695	1.349	0.979	0.641	1.316	1.015	0.698	1.331
13	1.019	0.661	1.377	1.032	0.691	1.372	0.991	0.645	1.338	1.021	0.690	1.352
14	1.034	0.664	1.405	1.041	0.690	1.392	1.002	0.640	1.364	1.026	0.686	1.367
15	1.047	0.666	1.428	1.051	0.688	1.414	1.011	0.632	1.390	1.031	0.679	1.382
16	1.058	0.666	1.450	1.059	0.685	1.433	1.018	0.623	1.413	1.034	0.672	1.397
17	1.067	0.665	1.469	1.067	0.682	1.452	1.024	0.613	1.434	1.037	0.664	1.410
18	1.075	0.663	1.487	1.073	0.677	1.469	1.028	0.603	1.454	1.039	0.657	1.422
19	1.081	0.659	1.503	1.078	0.672	1.484	1.032	0.593	1.472	1.041	0.649	1.434
20	1.086	0.655	1.518	1.083	0.666	1.499	1.035	0.582	1.489	1.043	0.641	1.445

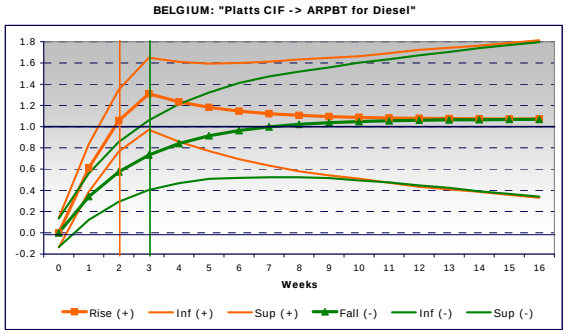
Illustration 19 – France: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Platts CIF → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective Platts CIF price

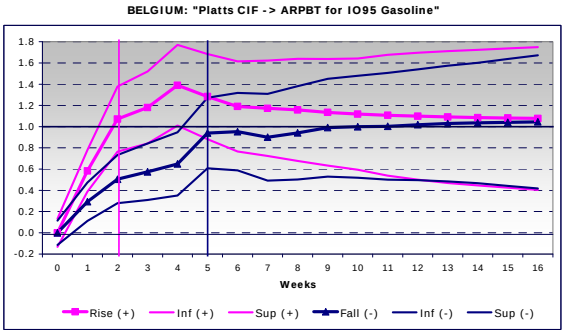




	FRANCE (33.5% MED & 66.5% NWE)											
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	-0.081	-0.154	-0.009	0.000	-0.092	0.092	-0.102	-0.185	-0.019	0.000	-0.100	0.100
1	0.630	0.507	0.754	0.544	0.406	0.682	0.619	0.484	0.755	0.535	0.400	0.670
2	0.940	0.779	**1.101**	0.892	0.729	**1.055**	0.862	0.672	**1.051**	0.924	0.767	**1.080**
3	0.860	0.678	1.043	1.036	0.856	1.217	0.849	0.646	1.053	0.858	0.674	1.043
4	0.980	0.774	1.185	1.007	0.809	1.206	0.965	0.740	1.190	0.880	0.683	1.076
5	0.892	0.665	1.119	1.158	0.944	1.372	0.941	0.705	1.177	1.008	0.801	1.215
6	0.954	0.709	1.199	1.115	0.884	1.346	0.928	0.680	1.176	0.987	0.765	1.210
7	0.922	0.663	1.182	1.120	0.875	1.364	0.943	0.685	1.202	0.995	0.764	1.227
8	0.964	0.687	1.241	1.114	0.852	1.375	0.948	0.668	1.227	0.998	0.755	1.240
9	0.949	0.656	1.241	1.110	0.836	1.384	0.949	0.656	1.242	1.001	0.748	1.254
10	0.972	0.670	1.273	1.107	0.822	1.391	0.953	0.648	1.258	1.004	0.740	1.268
11	0.966	0.649	1.282	1.103	0.807	1.400	0.957	0.639	1.275	1.007	0.730	1.283
12	0.981	0.649	1.313	1.100	0.785	1.416	0.961	0.632	1.289	1.009	0.724	1.294
13	0.980	0.637	1.323	1.098	0.772	1.424	0.964	0.626	1.302	1.012	0.715	1.310
14	0.990	0.634	1.346	1.095	0.758	1.433	0.967	0.622	1.313	1.015	0.707	1.322
15	0.992	0.627	1.356	1.093	0.745	1.441	0.971	0.613	1.328	1.017	0.699	1.335
16	0.999	0.626	1.372	1.091	0.732	1.449	0.974	0.604	1.343	1.020	0.691	1.348
17	1.001	0.620	1.383	1.089	0.721	1.457	0.977	0.596	1.357	1.022	0.683	1.361
18	1.007	0.617	1.397	1.087	0.709	1.465	0.980	0.588	1.371	1.024	0.676	1.373
19	1.010	0.612	1.407	1.086	0.698	1.473	0.983	0.580	1.385	1.026	0.668	1.385
20	1.014	0.608	1.420	1.084	0.687	1.481	0.985	0.573	1.398	1.028	0.661	1.396

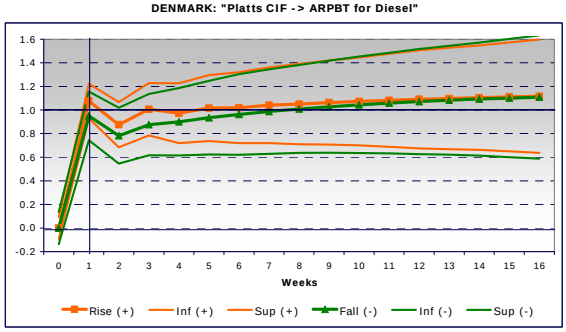
Illustration 20 – Belgium: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Platts CIF → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective Platts CIF price

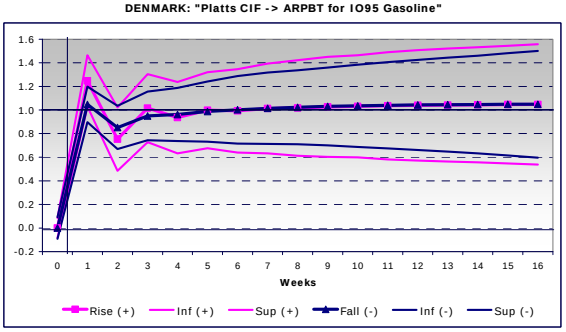




	BELGIUM (NWE)											
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.140	0.140	0.000	-0.134	0.134	0.000	-0.133	0.133	0.000	-0.114	0.114
1	0.613	0.388	0.837	0.342	0.123	0.561	0.583	0.388	0.779	0.293	0.112	0.473
2	1.058	0.766	**1.349**	0.574	0.292	0.857	1.071	0.764	**1.379**	0.505	0.278	0.733
3	1.310	0.971	1.650	0.733	0.405	**1.060**	1.181	0.841	1.520	0.575	0.309	0.841
4	1.234	0.858	1.610	0.841	0.468	1.213	1.390	1.010	1.770	0.649	0.351	0.947
5	1.182	0.771	1.593	0.914	0.507	1.321	1.283	0.882	1.685	0.940	0.608	**1.272**
6	1.146	0.693	1.599	0.964	0.517	1.411	1.190	0.765	1.615	0.953	0.588	1.318
7	1.122	0.633	1.611	0.998	0.524	1.472	1.173	0.723	1.622	0.900	0.491	1.310
8	1.106	0.579	1.633	1.021	0.524	1.518	1.158	0.677	1.638	0.942	0.502	1.381
9	1.095	0.541	1.648	1.037	0.516	1.559	1.135	0.632	1.638	0.991	0.530	1.451
10	1.087	0.510	1.664	1.048	0.492	1.603	1.118	0.594	1.642	0.999	0.519	1.480
11	1.082	0.471	1.692	1.055	0.475	1.635	1.107	0.538	1.676	1.003	0.500	1.507
12	1.078	0.433	1.723	1.060	0.447	1.673	1.098	0.500	1.696	1.018	0.496	1.539
13	1.076	0.409	1.743	1.063	0.423	1.704	1.091	0.470	1.712	1.030	0.484	1.575
14	1.074	0.386	1.762	1.066	0.391	1.740	1.085	0.447	1.723	1.035	0.469	1.602
15	1.073	0.358	1.789	1.067	0.366	1.769	1.081	0.425	1.736	1.040	0.442	1.637
16	1.072	0.330	1.814	1.068	0.341	1.796	1.077	0.405	1.750	1.045	0.418	1.672
17	1.072	0.305	1.839	1.069	0.317	1.822	1.075	0.386	1.764	1.049	0.394	1.704
18	1.071	0.280	1.863	1.070	0.293	1.846	1.072	0.367	1.778	1.052	0.370	1.734
19	1.071	0.255	1.887	1.070	0.270	1.870	1.071	0.350	1.792	1.054	0.347	1.762
20	1.071	0.232	1.910	1.070	0.247	1.893	1.070	0.333	1.806	1.057	0.324	1.789

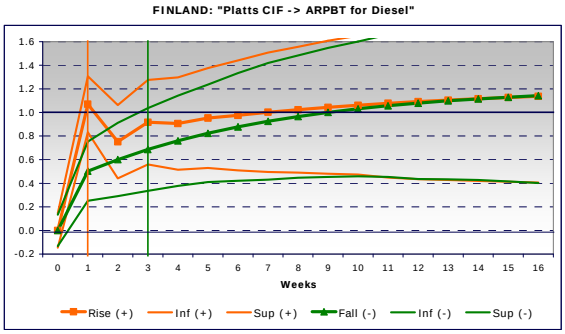
Illustration 21 – Denmark: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Platts CIF → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective Platts CIF price

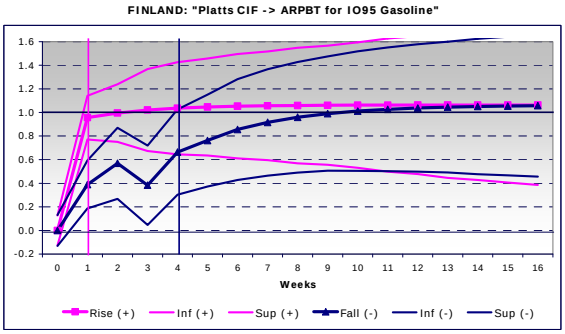




	DENMARK (NWE)											
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.092	0.092	0.000	-0.136	0.136	0.000	-0.084	0.084	0.000	-0.092	0.092
1	1.077	0.930	**1.223**	0.950	0.744	**1.157**	1.247	1.030	**1.465**	1.048	0.898	**1.199**
2	0.876	0.684	1.067	0.783	0.546	1.020	0.754	0.485	1.023	0.852	0.668	1.035
3	1.007	0.784	1.229	0.876	0.616	1.136	1.016	0.728	1.304	0.950	0.743	1.156
4	0.974	0.719	1.228	0.900	0.615	1.186	0.936	0.633	1.239	0.962	0.737	1.188
5	1.017	0.738	1.296	0.935	0.623	1.247	0.999	0.677	1.321	0.987	0.733	1.242
6	1.021	0.720	1.321	0.963	0.621	1.304	0.993	0.640	1.347	1.002	0.716	1.289
7	1.041	0.720	1.362	0.988	0.629	1.346	1.013	0.634	1.393	1.015	0.712	1.318
8	1.051	0.710	1.392	1.009	0.637	1.382	1.018	0.613	1.423	1.024	0.711	1.337
9	1.064	0.708	1.419	1.028	0.638	1.419	1.027	0.603	1.451	1.031	0.701	1.360
10	1.073	0.701	1.446	1.045	0.636	1.454	1.032	0.598	1.465	1.036	0.688	1.385
11	1.083	0.689	1.477	1.059	0.633	1.485	1.036	0.582	1.491	1.040	0.675	1.406
12	1.091	0.675	1.507	1.072	0.627	1.518	1.040	0.572	1.507	1.043	0.661	1.425
13	1.099	0.668	1.529	1.083	0.622	1.545	1.042	0.564	1.521	1.045	0.647	1.444
14	1.105	0.663	1.547	1.093	0.615	1.572	1.045	0.557	1.532	1.047	0.634	1.461
15	1.111	0.649	1.573	1.102	0.601	1.603	1.046	0.547	1.546	1.049	0.615	1.482
16	1.117	0.636	1.597	1.110	0.587	1.632	1.048	0.537	1.558	1.050	0.597	1.502
17	1.121	0.623	1.620	1.116	0.573	1.659	1.049	0.527	1.570	1.050	0.579	1.521
18	1.126	0.610	1.642	1.122	0.559	1.685	1.050	0.517	1.582	1.051	0.562	1.540
19	1.130	0.596	1.663	1.127	0.545	1.709	1.050	0.507	1.593	1.051	0.546	1.557
20	1.133	0.584	1.683	1.132	0.531	1.732	1.051	0.498	1.604	1.052	0.529	1.574

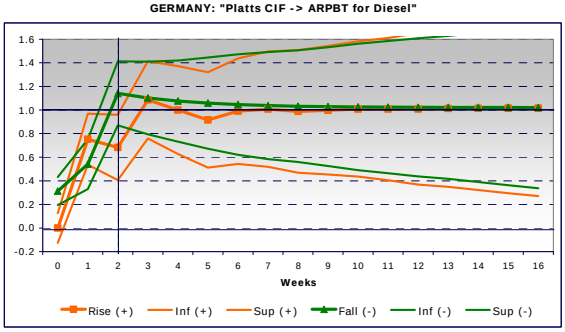
Illustration 22 – Finland: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Platts CIF → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective Platts CIF price

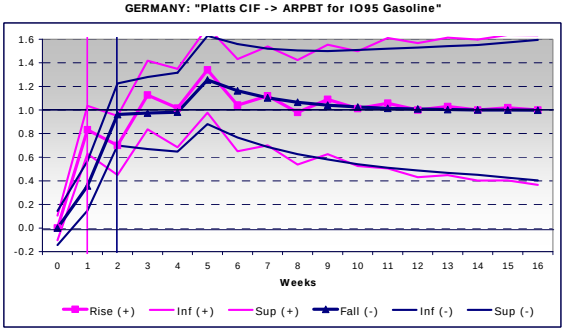




	FINLAND (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.146	0.146	0.000	-0.133	0.133	0.000	-0.127	0.127	0.000	-0.130	0.130
1	1.070	0.832	**1.308**	0.502	0.252	0.753	0.957	0.772	**1.142**	0.389	0.186	0.592
2	0.752	0.442	1.063	0.601	0.290	0.912	0.996	0.752	1.240	0.569	0.268	0.870
3	0.917	0.559	1.275	0.687	0.336	**1.037**	1.021	0.673	1.368	0.383	0.047	0.720
4	0.907	0.515	1.298	0.760	0.377	1.143	1.037	0.646	1.427	0.664	0.303	**1.026**
5	0.953	0.529	1.377	0.823	0.410	1.237	1.047	0.635	1.458	0.762	0.373	1.152
6	0.975	0.509	1.441	0.878	0.421	1.335	1.053	0.611	1.495	0.856	0.428	1.284
7	1.002	0.496	1.508	0.925	0.430	1.420	1.057	0.596	1.518	0.916	0.465	1.367
8	1.024	0.491	1.557	0.966	0.447	1.484	1.060	0.570	1.549	0.960	0.491	1.429
9	1.044	0.480	1.608	1.001	0.454	1.548	1.061	0.556	1.566	0.990	0.506	1.475
10	1.062	0.473	1.650	1.031	0.460	1.602	1.062	0.530	1.594	1.012	0.505	1.519
11	1.078	0.448	1.707	1.057	0.453	1.661	1.063	0.498	1.628	1.027	0.503	1.552
12	1.092	0.434	1.750	1.079	0.436	1.723	1.063	0.478	1.648	1.038	0.498	1.578
13	1.105	0.428	1.783	1.099	0.434	1.764	1.064	0.446	1.681	1.046	0.491	1.600
14	1.117	0.420	1.814	1.115	0.428	1.803	1.064	0.428	1.699	1.051	0.477	1.625
15	1.127	0.414	1.841	1.130	0.415	1.844	1.064	0.406	1.721	1.055	0.467	1.643
16	1.137	0.406	1.867	1.142	0.402	1.882	1.064	0.385	1.743	1.058	0.456	1.659
17	1.145	0.398	1.892	1.153	0.388	1.918	1.064	0.364	1.763	1.059	0.444	1.675
18	1.153	0.390	1.916	1.162	0.373	1.951	1.064	0.344	1.783	1.061	0.433	1.689
19	1.160	0.381	1.939	1.170	0.357	1.983	1.064	0.325	1.803	1.062	0.421	1.703
20	1.166	0.372	1.960	1.177	0.341	2.012	1.064	0.306	1.822	1.062	0.409	1.716

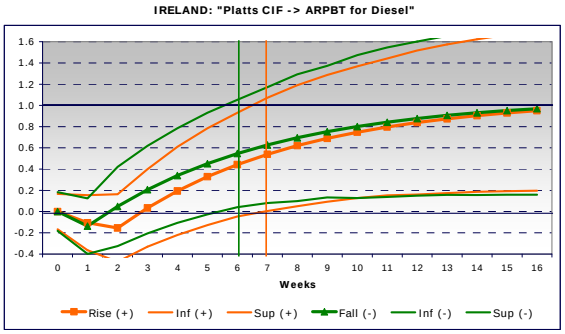
Illustration 23 – Germany: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Platts CIF → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective Platts CIF price

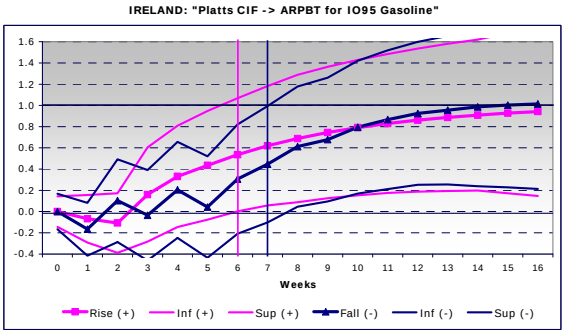




	GERMANY (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.126	0.126	0.314	0.194	0.433	0.000	-0.105	0.105	0.000	-0.145	0.145
1	0.753	0.536	**0.970**	0.541	0.330	0.753	0.833	0.629	**1.036**	0.356	0.147	0.566
2	0.683	0.407	**0.959**	1.142	0.870	**1.413**	0.700	0.450	0.950	0.963	0.699	**1.226**
3	1.086	0.759	**1.414**	1.103	0.795	1.411	1.127	0.836	1.418	0.975	0.670	1.280
4	1.000	0.628	1.373	1.076	0.733	1.420	1.017	0.684	1.349	0.983	0.648	1.317
5	0.916	0.511	1.321	1.059	0.673	1.445	1.341	0.977	1.704	1.256	0.882	1.629
6	0.991	0.544	1.438	1.046	0.621	1.472	1.041	0.650	1.432	1.163	0.767	1.559
7	1.008	0.518	1.497	1.038	0.584	1.492	1.120	0.701	1.540	1.104	0.686	1.521
8	0.988	0.470	1.507	1.033	0.559	1.506	0.980	0.537	1.424	1.066	0.626	1.505
9	0.998	0.453	1.544	1.029	0.525	1.533	1.090	0.627	1.554	1.041	0.582	1.500
10	1.009	0.435	1.582	1.026	0.491	1.562	1.013	0.526	1.499	1.025	0.541	1.510
11	1.008	0.404	1.612	1.025	0.464	1.585	1.058	0.505	1.611	1.015	0.510	1.520
12	1.009	0.369	1.650	1.023	0.438	1.609	1.000	0.431	1.568	1.009	0.488	1.529
13	1.013	0.350	1.677	1.023	0.416	1.629	1.031	0.448	1.613	1.004	0.467	1.542
14	1.014	0.322	1.706	1.022	0.390	1.654	1.000	0.403	1.598	1.002	0.451	1.552
15	1.015	0.296	1.735	1.022	0.363	1.680	1.020	0.404	1.637	1.000	0.426	1.574
16	1.017	0.270	1.763	1.022	0.338	1.705	1.000	0.365	1.635	0.999	0.403	1.595
17	1.018	0.245	1.790	1.021	0.314	1.729	1.011	0.358	1.663	0.998	0.381	1.616
18	1.018	0.221	1.815	1.021	0.290	1.752	0.998	0.329	1.668	0.998	0.359	1.636
19	1.019	0.198	1.840	1.021	0.267	1.775	1.006	0.319	1.692	0.997	0.339	1.656
20	1.019	0.175	1.864	1.021	0.245	1.797	0.998	0.295	1.701	0.997	0.319	1.675

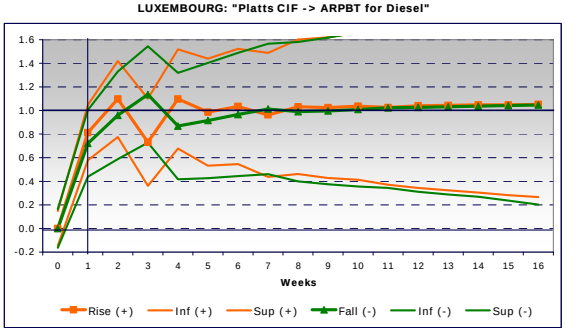
Illustration 24 – Ireland: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Platts CIF → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective Platts CIF price

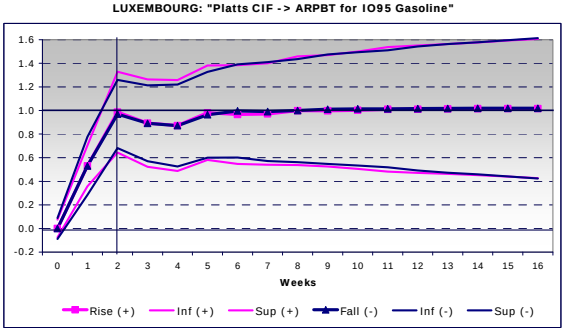




IRELAND (NWE)												
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.167	0.167	0.000	-0.182	0.182	0.000	-0.144	0.144	0.000	-0.167	0.167
1	-0.105	-0.364	0.154	-0.138	-0.399	0.124	-0.068	-0.292	0.157	-0.166	-0.415	0.082
2	-0.155	-0.473	0.164	0.049	-0.325	0.422	-0.108	-0.389	0.173	0.103	-0.287	0.493
3	0.034	-0.331	0.399	0.206	-0.207	0.619	0.161	-0.283	0.605	-0.035	-0.461	0.391
4	0.194	-0.222	0.609	0.339	-0.107	0.785	0.331	-0.146	0.808	0.204	-0.247	0.656
5	0.329	-0.127	0.784	0.452	-0.027	0.930	0.435	-0.076	0.947	0.043	-0.435	0.521
6	0.443	-0.045	0.931	0.547	0.041	**1.052**	0.535	0.001	**1.069**	0.306	-0.209	0.821
7	0.539	0.006	**1.073**	0.627	0.081	1.173	0.620	0.059	1.182	0.446	-0.102	**0.994**
8	0.621	0.051	1.190	0.695	0.098	1.293	0.688	0.088	1.289	0.612	0.046	1.178
9	0.690	0.093	1.286	0.753	0.132	1.373	0.744	0.126	1.363	0.678	0.095	1.261
10	0.748	0.127	1.369	0.801	0.128	1.474	0.791	0.153	1.429	0.795	0.170	1.420
11	0.797	0.153	1.442	0.842	0.138	1.546	0.830	0.175	1.484	0.866	0.213	1.520
12	0.839	0.160	1.517	0.877	0.151	1.603	0.861	0.187	1.535	0.925	0.252	1.599
13	0.874	0.173	1.575	0.906	0.158	1.654	0.887	0.193	1.582	0.955	0.256	1.654
14	0.904	0.186	1.622	0.931	0.156	1.706	0.909	0.199	1.619	0.986	0.238	1.734
15	0.929	0.193	1.666	0.952	0.158	1.745	0.927	0.173	1.681	1.003	0.228	1.778
16	0.950	0.196	1.705	0.970	0.158	1.781	0.942	0.146	1.737	1.014	0.213	1.815
17	0.968	0.197	1.740	0.985	0.156	1.814	0.954	0.119	1.789	1.018	0.192	1.844
18	0.984	0.195	1.772	0.997	0.151	1.843	0.964	0.091	1.837	1.021	0.171	1.872
19	0.996	0.191	1.802	1.008	0.145	1.871	0.972	0.063	1.881	1.022	0.147	1.896
20	1.007	0.185	1.829	1.017	0.138	1.896	0.979	0.035	1.923	1.021	0.124	1.919

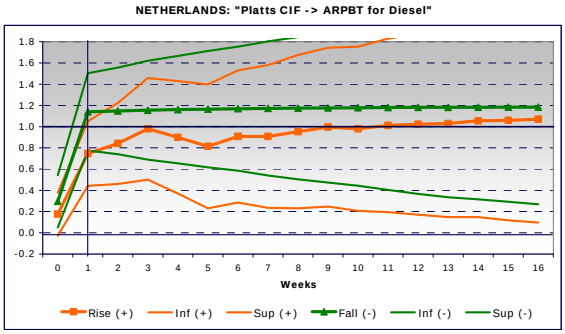
Illustration 25 – Luxembourg: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Platts CIF → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective Platts CIF price

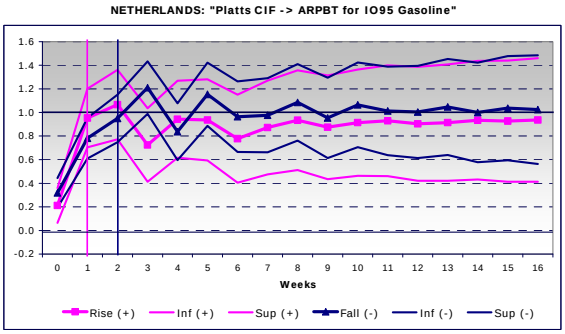




LUXEMBOURG (NWE)												
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.148	0.148	0.000	-0.164	0.164	0.000	-0.076	0.076	0.000	-0.089	0.089
1	0.813	0.578	**1.048**	0.722	0.439	**1.004**	0.531	0.357	0.704	0.531	0.284	0.777
2	1.098	0.776	1.420	0.959	0.589	1.330	0.986	0.643	**1.329**	0.970	0.681	**1.260**
3	0.731	0.361	1.102	1.136	0.728	1.544	0.893	0.523	1.263	0.892	0.570	1.214
4	1.098	0.677	1.518	0.868	0.417	1.320	0.873	0.487	1.259	0.872	0.525	1.219
5	0.987	0.533	1.440	0.915	0.427	1.404	0.981	0.580	1.383	0.964	0.600	1.328
6	1.034	0.546	1.523	0.967	0.445	1.489	0.966	0.548	1.385	0.997	0.602	1.392
7	0.963	0.438	1.489	1.014	0.461	1.567	0.971	0.540	1.402	0.991	0.572	1.410
8	1.031	0.461	1.601	0.991	0.401	1.581	0.999	0.538	1.459	0.999	0.563	1.436
9	1.024	0.428	1.620	0.996	0.375	1.617	0.998	0.526	1.471	1.011	0.548	1.475
10	1.037	0.412	1.661	1.009	0.356	1.663	1.002	0.505	1.500	1.014	0.533	1.495
11	1.026	0.371	1.680	1.023	0.345	1.702	1.010	0.483	1.537	1.015	0.519	1.511
12	1.040	0.344	1.735	1.027	0.311	1.742	1.011	0.471	1.551	1.017	0.491	1.543
13	1.043	0.323	1.763	1.031	0.288	1.774	1.013	0.463	1.563	1.018	0.472	1.564
14	1.048	0.305	1.792	1.037	0.270	1.804	1.016	0.453	1.578	1.019	0.459	1.578
15	1.048	0.283	1.814	1.042	0.236	1.849	1.016	0.440	1.593	1.019	0.441	1.597
16	1.053	0.266	1.839	1.046	0.203	1.890	1.017	0.427	1.607	1.019	0.424	1.615
17	1.056	0.248	1.863	1.050	0.170	1.930	1.018	0.415	1.621	1.019	0.407	1.632
18	1.058	0.231	1.885	1.053	0.139	1.967	1.018	0.402	1.634	1.020	0.390	1.649
19	1.060	0.213	1.907	1.056	0.109	2.004	1.019	0.390	1.647	1.020	0.374	1.665
20	1.062	0.196	1.928	1.059	0.080	2.038	1.019	0.378	1.660	1.020	0.358	1.681

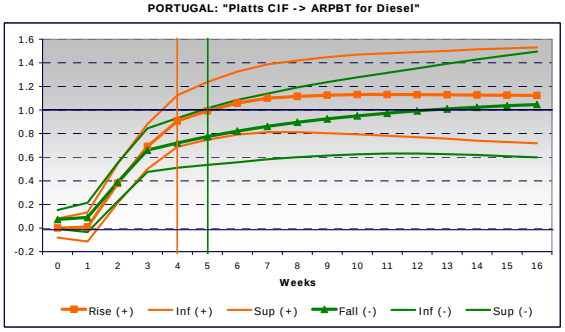
Illustration 26 – Netherlands: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Platts CIF → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective Platts CIF price

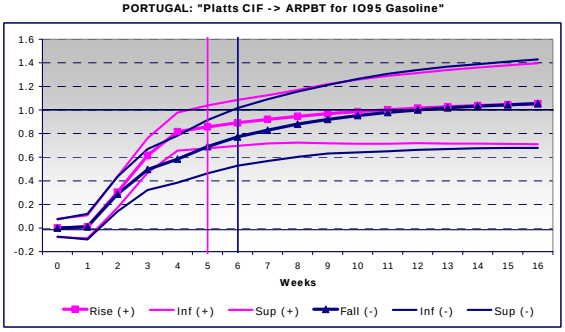




	NETHERLANDS (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.176	-0.026	0.377	0.296	0.050	0.542	0.211	0.064	0.358	0.319	0.195	0.443
1	0.747	0.442	**1.052**	1.140	0.775	**1.504**	0.953	0.704	**1.201**	0.782	0.609	0.954
2	0.842	0.461	1.222	1.148	0.740	1.556	1.067	0.773	1.362	0.950	0.748	**1.151**
3	0.980	0.502	1.458	1.155	0.688	1.621	0.724	0.412	1.036	1.211	0.988	1.434
4	0.899	0.369	1.430	1.160	0.654	1.666	0.943	0.617	1.268	0.837	0.597	1.078
5	0.814	0.231	1.398	1.165	0.616	1.714	0.937	0.593	1.281	1.154	0.886	1.422
6	0.908	0.285	1.530	1.169	0.585	1.753	0.778	0.404	1.152	0.965	0.666	1.264
7	0.908	0.234	1.581	1.172	0.539	1.804	0.873	0.474	1.271	0.977	0.663	1.291
8	0.953	0.231	1.674	1.174	0.504	1.845	0.934	0.512	1.357	1.086	0.761	1.410
9	0.995	0.247	1.744	1.177	0.473	1.881	0.875	0.434	1.315	0.955	0.615	1.295
10	0.980	0.206	1.753	1.178	0.443	1.914	0.914	0.464	1.363	1.065	0.706	1.423
11	1.011	0.194	1.829	1.180	0.405	1.955	0.930	0.460	1.400	1.013	0.638	1.388
12	1.023	0.171	1.875	1.181	0.366	1.997	0.904	0.422	1.387	1.005	0.614	1.396
13	1.029	0.149	1.910	1.182	0.336	2.029	0.915	0.421	1.408	1.047	0.640	1.454
14	1.055	0.148	1.962	1.183	0.315	2.051	0.935	0.432	1.437	1.000	0.578	1.422
15	1.059	0.117	2.000	1.184	0.292	2.076	0.927	0.414	1.441	1.037	0.595	1.479
16	1.071	0.096	2.046	1.184	0.268	2.100	0.937	0.412	1.461	1.025	0.564	1.485
17	1.084	0.076	2.091	1.185	0.246	2.124	0.945	0.410	1.480	1.019	0.540	1.497
18	1.088	0.049	2.126	1.185	0.223	2.147	0.945	0.399	1.490	1.035	0.539	1.531
19	1.099	0.030	2.169	1.186	0.201	2.170	0.947	0.391	1.503	1.019	0.506	1.532
20	1.106	0.007	2.205	1.186	0.180	2.192	0.955	0.389	1.521	1.031	0.502	1.559

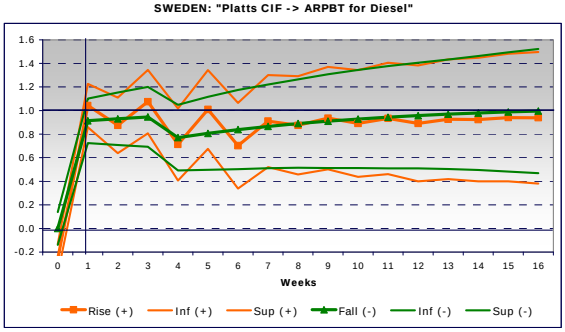
Illustration 27 – Portugal: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Platts CIF → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective Platts CIF price

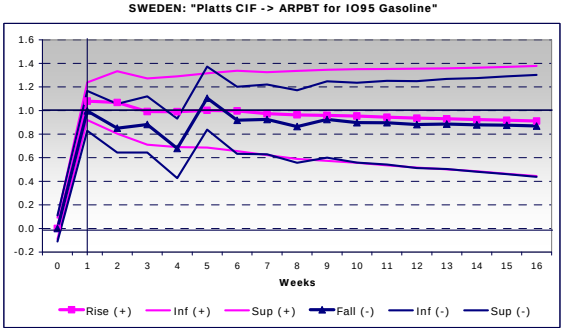




	PORTUGAL (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.081	0.081	0.072	-0.007	0.152	0.000	-0.078	0.078	0.000	-0.073	0.073
1	0.009	-0.115	0.133	0.090	-0.034	0.214	0.010	-0.088	0.108	0.011	-0.097	0.120
2	0.377	0.210	0.544	0.389	0.226	0.552	0.304	0.171	0.437	0.287	0.140	0.435
3	0.691	0.500	0.882	0.660	0.475	0.844	0.615	0.469	0.761	0.496	0.322	0.670
4	0.907	0.689	**1.126**	0.722	0.511	0.932	0.817	0.655	0.979	0.584	0.384	0.783
5	0.993	0.748	1.239	0.775	0.534	**1.016**	0.857	0.677	**1.038**	0.690	0.464	0.915
6	1.059	0.791	1.327	0.821	0.557	1.085	0.892	0.697	1.086	0.772	0.529	**1.016**
7	1.100	0.814	1.387	0.861	0.583	1.140	0.921	0.717	1.126	0.829	0.567	1.091
8	1.116	0.813	1.419	0.896	0.600	1.192	0.947	0.723	1.170	0.880	0.603	1.157
9	1.126	0.804	1.449	0.926	0.615	1.237	0.968	0.718	1.219	0.921	0.630	1.212
10	1.131	0.793	1.469	0.951	0.625	1.278	0.987	0.714	1.259	0.953	0.641	1.264
11	1.131	0.782	1.481	0.974	0.632	1.315	1.003	0.715	1.290	0.979	0.651	1.308
12	1.131	0.770	1.492	0.993	0.632	1.353	1.016	0.720	1.313	1.001	0.663	1.340
13	1.130	0.758	1.501	1.010	0.626	1.393	1.028	0.715	1.340	1.019	0.669	1.368
14	1.128	0.741	1.515	1.024	0.618	1.430	1.038	0.716	1.360	1.033	0.676	1.390
15	1.126	0.729	1.523	1.036	0.609	1.464	1.046	0.713	1.379	1.045	0.679	1.411
16	1.124	0.718	1.531	1.047	0.598	1.496	1.054	0.710	1.397	1.054	0.679	1.429
17	1.123	0.707	1.539	1.056	0.588	1.525	1.060	0.706	1.414	1.062	0.678	1.446
18	1.121	0.696	1.547	1.064	0.576	1.552	1.065	0.701	1.429	1.068	0.676	1.461
19	1.120	0.686	1.555	1.071	0.565	1.578	1.070	0.696	1.443	1.074	0.672	1.475
20	1.119	0.676	1.563	1.077	0.553	1.602	1.074	0.690	1.457	1.078	0.668	1.487

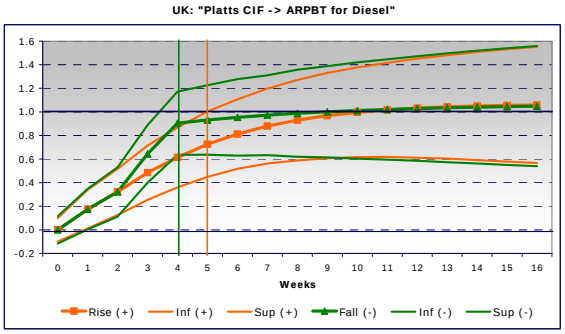
Illustration 28 – Sweden: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Platts CIF → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective Platts CIF price

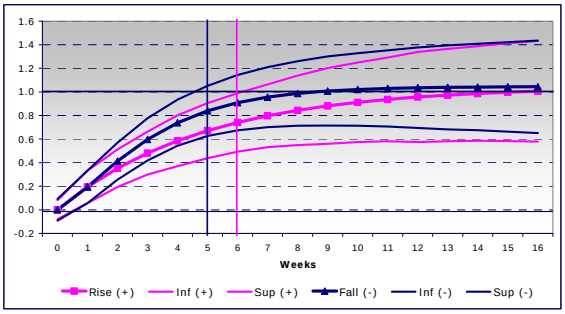




	SWEDEN (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	-0.258	-0.384	-0.133	0.000	-0.140	0.140	0.000	-0.091	0.091	0.000	-0.110	0.110
1	1.043	0.859	**1.227**	0.913	0.724	**1.103**	1.080	0.921	**1.240**	0.998	0.828	**1.167**
2	0.874	0.638	1.111	0.931	0.708	1.153	1.068	0.804	1.333	0.851	0.645	1.056
3	1.076	0.807	1.345	0.946	0.692	1.200	0.992	0.710	1.273	0.883	0.645	1.121
4	0.713	0.407	1.018	0.771	0.492	1.049	0.990	0.690	1.290	0.680	0.427	0.933
5	1.010	0.677	1.344	0.807	0.498	1.116	1.002	0.686	1.317	1.105	0.837	1.373
6	0.702	0.339	1.065	0.839	0.503	1.174	0.997	0.656	1.338	0.918	0.634	1.201
7	0.911	0.521	1.301	0.866	0.511	1.221	0.974	0.622	1.326	0.925	0.629	1.220
8	0.875	0.459	1.292	0.890	0.515	1.264	0.964	0.590	1.337	0.865	0.558	1.172
9	0.936	0.502	1.370	0.910	0.513	1.307	0.960	0.573	1.347	0.925	0.602	1.249
10	0.891	0.438	1.344	0.928	0.512	1.345	0.954	0.556	1.352	0.898	0.559	1.236
11	0.933	0.461	1.406	0.944	0.510	1.378	0.944	0.536	1.353	0.897	0.543	1.252
12	0.891	0.400	1.383	0.958	0.509	1.406	0.936	0.516	1.356	0.881	0.513	1.249
13	0.926	0.418	1.435	0.969	0.504	1.434	0.930	0.502	1.358	0.886	0.504	1.268
14	0.923	0.399	1.448	0.979	0.496	1.463	0.924	0.485	1.363	0.879	0.481	1.276
15	0.941	0.400	1.482	0.988	0.483	1.494	0.918	0.464	1.371	0.876	0.460	1.291
16	0.939	0.382	1.496	0.996	0.469	1.523	0.911	0.444	1.379	0.870	0.437	1.302
17	0.949	0.376	1.522	1.003	0.455	1.550	0.906	0.424	1.387	0.867	0.418	1.316
18	0.946	0.359	1.534	1.008	0.442	1.575	0.901	0.406	1.396	0.863	0.398	1.328
19	0.955	0.352	1.557	1.014	0.428	1.599	0.896	0.388	1.404	0.860	0.379	1.341
20	0.957	0.341	1.574	1.018	0.414	1.622	0.891	0.370	1.411	0.856	0.361	1.352

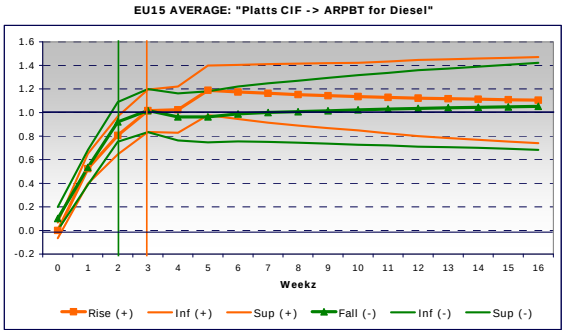
Illustration 29 – UK: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Platts CIF → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective Platts CIF price

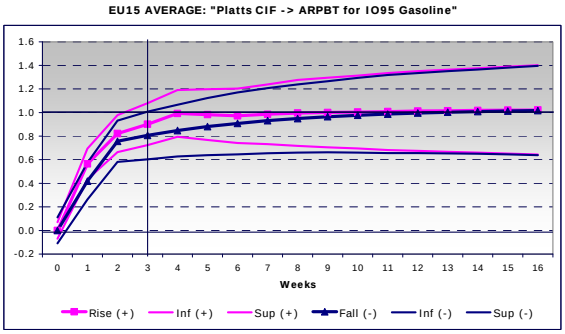




	UK (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.100	0.100	0.000	-0.116	0.116	0.000	-0.080	0.080	0.000	-0.091	0.091
1	0.175	0.011	0.340	0.175	0.003	0.348	0.194	0.057	0.331	0.194	0.056	0.332
2	0.322	0.126	0.518	0.322	0.112	0.532	0.352	0.193	0.512	0.413	0.255	0.570
3	0.485	0.254	0.716	0.644	0.399	0.889	0.481	0.299	0.663	0.598	0.419	0.778
4	0.614	0.361	0.868	0.904	0.636	**1.173**	0.586	0.371	0.801	0.739	0.543	0.935
5	0.726	0.449	**1.004**	0.931	0.637	1.226	0.671	0.438	0.905	0.840	0.627	**1.052**
6	0.812	0.518	1.107	0.954	0.629	1.278	0.741	0.493	**0.988**	0.909	0.674	1.144
7	0.880	0.562	1.198	0.972	0.634	1.311	0.797	0.531	1.064	0.956	0.701	1.210
8	0.931	0.589	1.272	0.988	0.619	1.357	0.844	0.549	1.138	0.987	0.713	1.261
9	0.969	0.607	1.331	1.001	0.614	1.388	0.881	0.560	1.202	1.008	0.715	1.301
10	0.997	0.616	1.377	1.012	0.603	1.421	0.912	0.574	1.249	1.021	0.713	1.329
11	1.017	0.618	1.417	1.021	0.596	1.447	0.936	0.581	1.292	1.030	0.706	1.354
12	1.032	0.612	1.452	1.029	0.586	1.473	0.957	0.574	1.339	1.035	0.694	1.377
13	1.043	0.604	1.481	1.035	0.574	1.497	0.973	0.582	1.365	1.039	0.683	1.395
14	1.050	0.591	1.510	1.041	0.562	1.519	0.987	0.585	1.388	1.041	0.675	1.408
15	1.056	0.579	1.532	1.045	0.551	1.539	0.998	0.583	1.412	1.043	0.663	1.422
16	1.059	0.567	1.552	1.049	0.540	1.558	1.006	0.579	1.434	1.044	0.652	1.436
17	1.062	0.554	1.570	1.052	0.528	1.576	1.014	0.574	1.453	1.044	0.640	1.448
18	1.064	0.540	1.587	1.055	0.516	1.593	1.020	0.568	1.471	1.045	0.629	1.460
19	1.065	0.527	1.604	1.057	0.505	1.609	1.024	0.561	1.488	1.045	0.618	1.472
20	1.066	0.513	1.619	1.059	0.493	1.624	1.028	0.553	1.503	1.045	0.607	1.483

Illustration 30 – EU15 average: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Platts CIF → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective Platts CIF price

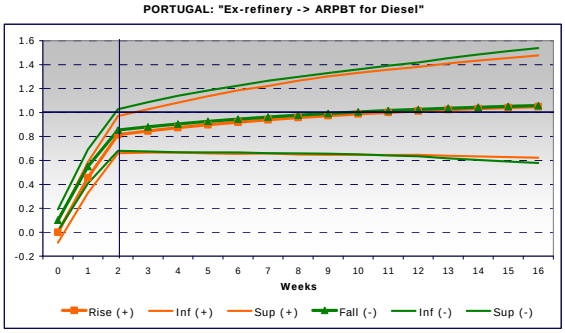


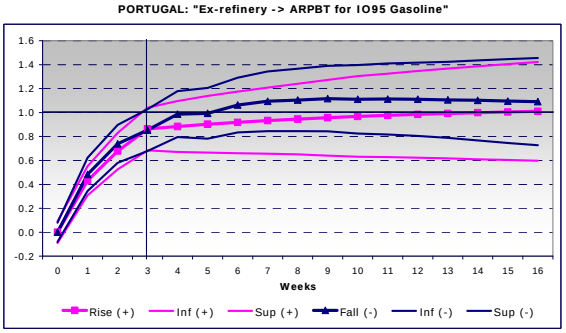


	EU15 AVERAGE											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.066	0.066	0.101	0.003	0.199	0.000	-0.070	0.070	0.000	-0.110	0.110
1	0.524	0.397	0.651	0.536	0.389	0.683	0.564	0.434	0.695	0.418	0.262	0.575
2	0.807	0.646	0.967	0.922	0.753	**1.090**	0.822	0.665	0.979	0.756	0.581	0.931
3	1.016	0.836	**1.196**	1.017	0.834	1.200	0.902	0.724	**1.080**	0.806	0.604	**1.008**
4	1.025	0.829	1.221	0.963	0.764	1.162	0.993	0.794	1.191	0.847	0.628	1.066
5	1.189	0.979	1.399	0.964	0.748	1.180	0.983	0.768	1.198	0.881	0.639	1.123
6	1.175	0.946	1.404	0.988	0.756	1.220	0.972	0.741	1.204	0.909	0.646	1.171
7	1.163	0.915	1.412	1.000	0.752	1.249	0.986	0.732	1.239	0.931	0.655	1.207
8	1.153	0.890	1.415	1.007	0.745	1.269	0.997	0.717	1.276	0.950	0.660	1.239
9	1.144	0.868	1.419	1.015	0.737	1.294	1.001	0.705	1.296	0.965	0.664	1.266
10	1.136	0.849	1.422	1.023	0.728	1.318	1.004	0.696	1.313	0.978	0.660	1.295
11	1.129	0.823	1.434	1.029	0.722	1.337	1.009	0.682	1.336	0.988	0.657	1.318
12	1.123	0.799	1.446	1.035	0.711	1.360	1.013	0.675	1.351	0.996	0.657	1.336
13	1.118	0.784	1.451	1.040	0.707	1.374	1.016	0.668	1.364	1.003	0.654	1.352
14	1.113	0.768	1.458	1.045	0.701	1.389	1.018	0.660	1.376	1.009	0.652	1.366
15	1.109	0.754	1.464	1.049	0.692	1.406	1.021	0.652	1.389	1.013	0.645	1.381
16	1.106	0.740	1.471	1.053	0.683	1.422	1.022	0.644	1.401	1.017	0.638	1.396
17	1.103	0.727	1.478	1.056	0.675	1.438	1.024	0.636	1.412	1.020	0.631	1.410
18	1.100	0.715	1.485	1.059	0.666	1.452	1.026	0.628	1.423	1.023	0.623	1.422
19	1.098	0.704	1.492	1.062	0.657	1.466	1.027	0.620	1.434	1.025	0.615	1.434
20	1.096	0.692	1.499	1.064	0.648	1.480	1.028	0.612	1.444	1.027	0.607	1.446

1787. Finally, as referred in the text (subsection 12.3.2), we present the additional national channel "Ex-refinery → APPBT", similar to the one analyzed in the Interim Report, but with (weekly) data over the entire 2004-2008 period, on the way shocks to national (average) ex-refinery prices – as indexed to the corresponding Platts CIF NWE prices – pass-through to APPBT. As referred in the text (*cit.*), there is no evidence of asymmetries in this channel, both over the delay and the amplitude of adjustment (see Illustration below).

Illustration 31 – National channel "Ex-refinery → APPBT": IRF (in cts/lt) and corresponding CI (95%) estimates, for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective (average) ex-refinery price



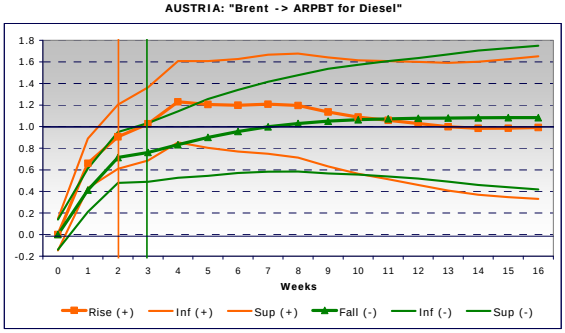


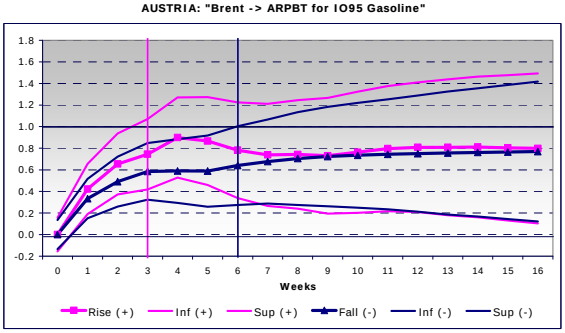
	PORTUGAL: "Ex-refinery -> ARPBT"											
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.088	0.088	0.101	0.011	0.191	0.000	-0.090	0.090	0.000	-0.080	0.080
1	0.456	0.328	0.584	0.549	0.407	0.691	0.431	0.309	0.552	0.484	0.344	0.623
2	0.815	0.660	**0.971**	0.854	0.680	**1.028**	0.677	0.525	0.830	0.738	0.580	0.896
3	0.846	0.665	1.027	0.881	0.675	1.087	0.863	0.684	**1.042**	0.854	0.679	**1.028**
4	0.873	0.664	1.082	0.905	0.668	1.141	0.884	0.671	1.096	0.987	0.794	1.180
5	0.898	0.660	1.136	0.926	0.667	1.185	0.902	0.666	1.138	0.994	0.782	1.206
6	0.920	0.655	1.186	0.946	0.667	1.224	0.918	0.661	1.175	1.063	0.834	1.291
7	0.940	0.658	1.222	0.963	0.660	1.266	0.932	0.656	1.209	1.094	0.845	1.344
8	0.958	0.650	1.266	0.979	0.659	1.298	0.945	0.651	1.240	1.105	0.844	1.366
9	0.974	0.646	1.302	0.993	0.656	1.329	0.957	0.641	1.273	1.116	0.842	1.390
10	0.989	0.646	1.331	1.005	0.650	1.360	0.967	0.630	1.304	1.111	0.824	1.397
11	1.002	0.645	1.358	1.017	0.642	1.391	0.976	0.628	1.324	1.113	0.816	1.410
12	1.013	0.646	1.381	1.027	0.635	1.418	0.985	0.621	1.348	1.111	0.805	1.417
13	1.024	0.638	1.410	1.036	0.618	1.454	0.992	0.617	1.367	1.106	0.789	1.423
14	1.033	0.632	1.434	1.044	0.603	1.485	0.998	0.610	1.387	1.102	0.767	1.437
15	1.042	0.628	1.456	1.052	0.591	1.513	1.004	0.604	1.405	1.096	0.745	1.446
16	1.049	0.622	1.477	1.058	0.578	1.538	1.009	0.597	1.422	1.091	0.727	1.456
17	1.056	0.617	1.496	1.064	0.566	1.563	1.014	0.590	1.438	1.087	0.708	1.466
18	1.063	0.610	1.515	1.070	0.553	1.586	1.018	0.583	1.454	1.083	0.690	1.475
19	1.068	0.604	1.532	1.074	0.541	1.608	1.022	0.576	1.468	1.079	0.673	1.485
20	1.073	0.597	1.549	1.079	0.529	1.629	1.025	0.568	1.482	1.075	0.657	1.494

A3.4.3. Integrated domestic channels "Brent → APPBT"

1788. We present below the IRF and corresponding CI (95%) estimates on the integrated domestic channels "Brent → APPBT", per fuel (diesel and IO95 gasoline) and for each EU15 Member State, including the EU15 average, disentangled between a 1 cts/lt rise and fall of the price for (the 1-month futures of) Brent (see Illustrations below).

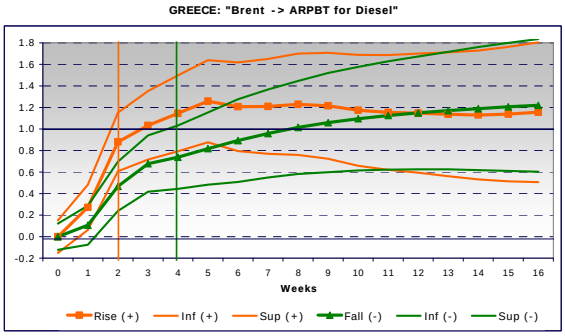
Illustration 32 – Austria: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Brent → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the price Brent

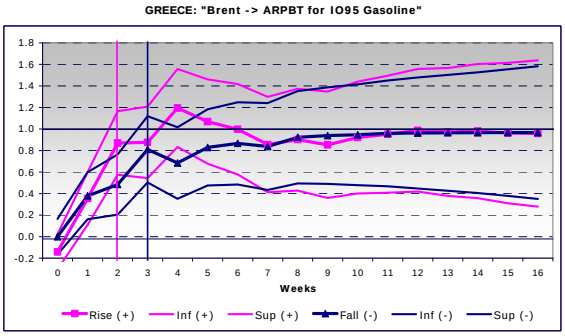




	AUSTRIA (MED)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.147	0.147	0.000	-0.138	0.138	0.000	-0.156	0.156	0.000	-0.135	0.135
1	0.661	0.432	0.889	0.412	0.211	0.614	0.423	0.190	0.656	0.334	0.151	0.516
2	0.907	0.609	**1.205**	0.714	0.479	0.950	0.655	0.372	0.937	0.491	0.260	0.722
3	1.026	0.686	1.365	0.761	0.489	**1.033**	0.744	0.419	**1.070**	0.585	0.323	0.848
4	1.230	0.854	1.606	0.834	0.526	1.141	0.899	0.527	1.270	0.590	0.294	0.885
5	1.206	0.804	1.607	0.900	0.545	1.256	0.867	0.459	1.275	0.589	0.258	0.919
6	1.198	0.770	1.627	0.956	0.571	1.340	0.781	0.338	1.225	0.639	0.274	**1.005**
7	1.208	0.749	1.666	0.999	0.583	1.416	0.739	0.266	1.213	0.677	0.287	1.067
8	1.196	0.713	1.678	1.030	0.583	1.478	0.742	0.240	1.245	0.705	0.274	1.135
9	1.137	0.631	1.642	1.051	0.566	1.536	0.731	0.195	1.266	0.723	0.262	1.183
10	1.089	0.564	1.614	1.064	0.555	1.573	0.763	0.202	1.324	0.735	0.249	1.221
11	1.059	0.512	1.606	1.072	0.538	1.607	0.796	0.217	1.376	0.744	0.234	1.254
12	1.029	0.459	1.599	1.077	0.519	1.636	0.809	0.208	1.410	0.750	0.212	1.288
13	0.999	0.407	1.591	1.080	0.491	1.669	0.808	0.179	1.438	0.756	0.185	1.326
14	0.985	0.368	1.602	1.082	0.459	1.705	0.811	0.159	1.463	0.761	0.167	1.355
15	0.985	0.346	1.625	1.083	0.438	1.728	0.804	0.130	1.478	0.765	0.143	1.387
16	0.991	0.330	1.652	1.084	0.418	1.750	0.799	0.105	1.494	0.769	0.121	1.417
17	1.003	0.321	1.685	1.085	0.398	1.771	0.801	0.086	1.515	0.773	0.099	1.447
18	1.022	0.319	1.724	1.085	0.379	1.791	0.805	0.071	1.539	0.776	0.078	1.475
19	1.044	0.322	1.766	1.085	0.360	1.810	0.807	0.054	1.560	0.780	0.058	1.501
20	1.065	0.324	1.807	1.085	0.342	1.829	0.810	0.039	1.582	0.783	0.038	1.527

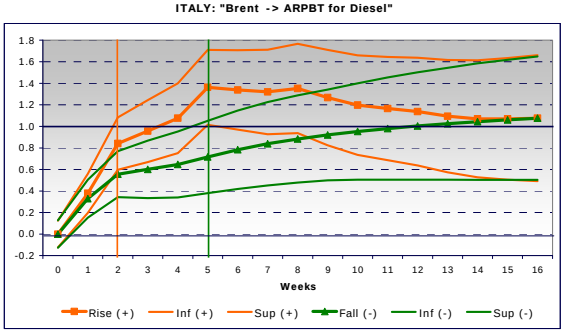
Illustration 33 – Greece: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Brent → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the price Brent

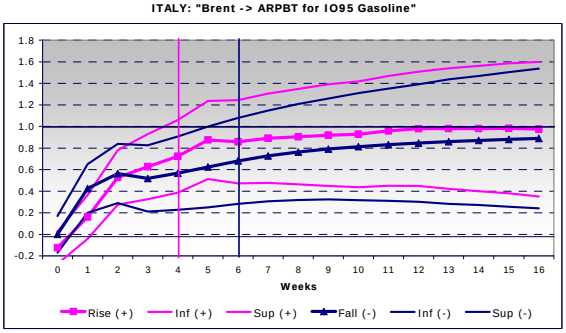




	GREECE (MED)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.151	0.151	0.000	-0.122	0.122	-0.141	-0.304	0.022	0.000	-0.165	0.165
1	0.273	0.062	0.483	0.106	-0.075	0.287	0.354	0.110	0.599	0.379	0.161	0.598
2	0.880	0.608	**1.153**	0.467	0.238	0.696	0.870	0.575	**1.164**	0.485	0.206	0.763
3	1.034	0.716	1.352	0.679	0.417	0.940	0.876	0.543	1.209	0.811	0.502	**1.119**
4	1.146	0.793	1.498	0.739	0.445	**1.033**	1.195	0.833	1.557	0.684	0.353	1.016
5	1.258	0.876	1.640	0.818	0.482	1.153	1.069	0.677	1.461	0.829	0.475	1.183
6	1.207	0.796	1.619	0.892	0.508	1.276	0.997	0.577	1.418	0.867	0.485	1.249
7	1.210	0.770	1.650	0.959	0.550	1.367	0.856	0.412	1.299	0.837	0.434	1.240
8	1.229	0.759	1.700	1.014	0.582	1.447	0.901	0.428	1.373	0.924	0.495	1.353
9	1.216	0.723	1.708	1.060	0.599	1.520	0.854	0.359	1.348	0.939	0.491	1.386
10	1.174	0.659	1.688	1.096	0.614	1.577	0.920	0.402	1.439	0.947	0.479	1.415
11	1.154	0.622	1.686	1.125	0.623	1.628	0.952	0.408	1.495	0.959	0.467	1.452
12	1.148	0.594	1.701	1.150	0.626	1.674	0.988	0.418	1.557	0.962	0.446	1.479
13	1.137	0.561	1.712	1.171	0.625	1.717	0.972	0.378	1.566	0.964	0.426	1.502
14	1.130	0.531	1.728	1.189	0.618	1.761	0.981	0.358	1.604	0.966	0.406	1.526
15	1.138	0.514	1.762	1.205	0.611	1.800	0.963	0.311	1.614	0.967	0.378	1.555
16	1.156	0.507	1.804	1.220	0.604	1.836	0.958	0.279	1.637	0.967	0.352	1.583
17	1.175	0.502	1.848	1.233	0.596	1.870	0.954	0.249	1.659	0.968	0.326	1.609
18	1.198	0.503	1.894	1.244	0.587	1.902	0.963	0.232	1.693	0.968	0.302	1.634
19	1.226	0.508	1.944	1.255	0.577	1.932	0.963	0.208	1.718	0.968	0.278	1.659
20	1.254	0.515	1.994	1.264	0.568	1.961	0.969	0.190	1.747	0.968	0.255	1.682

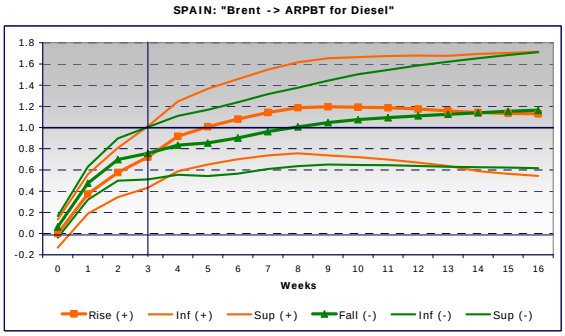
Illustration 34 – Italy: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Brent → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the price for Brent

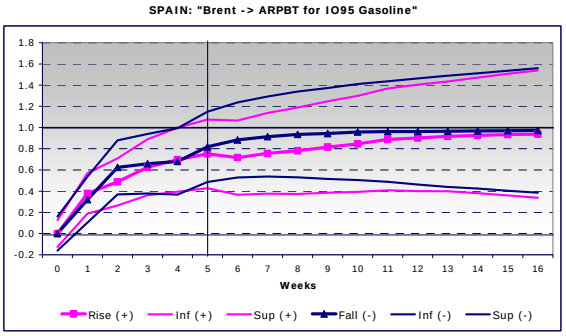




	ITALY (MED)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.124	0.124	0.000	-0.126	0.126	-0.124	-0.273	0.026	0.000	-0.170	0.170
1	0.379	0.197	0.561	0.329	0.153	0.504	0.161	-0.042	0.364	0.425	0.201	0.650
2	0.841	0.597	**1.084**	0.556	0.343	0.768	0.528	0.274	0.781	0.564	0.289	0.839
3	0.956	0.668	1.243	0.600	0.334	0.867	0.627	0.325	**0.929**	0.518	0.210	0.826
4	1.076	0.752	1.399	0.647	0.341	**0.953**	0.723	0.386	1.060	0.567	0.228	**0.907**
5	1.363	1.015	1.710	0.716	0.381	1.052	0.875	0.512	1.237	0.625	0.251	0.999
6	1.338	0.969	1.707	0.783	0.418	1.148	0.859	0.473	1.244	0.681	0.283	1.079
7	1.319	0.927	1.712	0.838	0.451	1.225	0.891	0.476	1.305	0.727	0.307	1.148
8	1.352	0.938	1.766	0.883	0.478	1.288	0.905	0.463	1.347	0.763	0.317	1.209
9	1.267	0.825	1.709	0.921	0.499	1.342	0.920	0.448	1.391	0.791	0.323	1.259
10	1.197	0.736	1.659	0.953	0.506	1.399	0.927	0.437	1.417	0.813	0.317	1.309
11	1.165	0.686	1.644	0.980	0.505	1.454	0.959	0.449	1.468	0.831	0.312	1.351
12	1.137	0.637	1.638	1.004	0.504	1.503	0.979	0.449	1.509	0.846	0.302	1.391
13	1.094	0.573	1.616	1.025	0.505	1.544	0.980	0.422	1.539	0.859	0.282	1.437
14	1.070	0.527	1.613	1.044	0.503	1.584	0.980	0.399	1.561	0.871	0.273	1.469
15	1.070	0.506	1.634	1.061	0.504	1.618	0.982	0.379	1.585	0.880	0.257	1.504
16	1.076	0.492	1.660	1.076	0.503	1.649	0.975	0.351	1.599	0.889	0.241	1.537
17	1.085	0.481	1.689	1.090	0.501	1.679	0.973	0.329	1.618	0.896	0.224	1.567
18	1.105	0.482	1.728	1.102	0.498	1.706	0.972	0.307	1.636	0.902	0.208	1.597
19	1.132	0.491	1.773	1.113	0.494	1.732	0.970	0.286	1.654	0.908	0.191	1.624
20	1.158	0.499	1.817	1.124	0.490	1.757	0.968	0.265	1.670	0.912	0.175	1.650

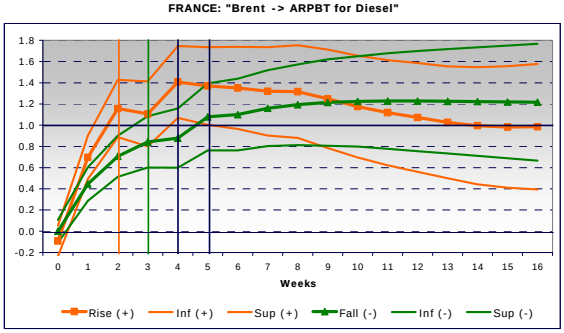
Illustration 35 – Spain: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Brent → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the price for Brent

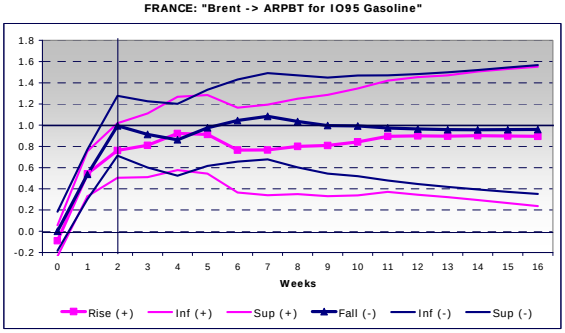




	SPAIN (66.1% MED & 33.9% NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.132	0.132	0.064	-0.038	0.165	0.000	-0.126	0.126	0.000	-0.161	0.161
1	0.374	0.188	0.560	0.476	0.320	0.631	0.379	0.188	0.570	0.319	0.103	0.536
2	0.576	0.344	0.808	0.698	0.499	0.897	0.487	0.265	0.709	0.625	0.369	0.880
3	0.722	0.431	**1.013**	0.757	0.510	**1.005**	0.626	0.363	0.890	0.659	0.378	0.940
4	0.917	0.587	1.247	0.833	0.555	1.111	0.696	0.395	0.998	0.681	0.367	0.994
5	1.008	0.651	1.366	0.854	0.542	1.167	0.752	0.428	**1.076**	0.818	0.487	**1.150**
6	1.079	0.701	1.457	0.902	0.565	1.238	0.716	0.366	1.066	0.883	0.529	1.237
7	1.142	0.738	1.546	0.962	0.610	1.315	0.756	0.375	1.137	0.915	0.538	1.292
8	1.187	0.757	1.616	1.006	0.636	1.376	0.781	0.374	1.189	0.935	0.530	1.340
9	1.195	0.738	1.653	1.047	0.652	1.443	0.817	0.386	1.247	0.944	0.515	1.373
10	1.192	0.720	1.664	1.075	0.647	1.502	0.846	0.394	1.299	0.958	0.506	1.411
11	1.186	0.698	1.675	1.094	0.644	1.543	0.888	0.409	1.368	0.962	0.487	1.436
12	1.174	0.669	1.679	1.111	0.637	1.585	0.902	0.400	1.405	0.963	0.463	1.463
13	1.156	0.637	1.676	1.126	0.631	1.621	0.917	0.399	1.434	0.965	0.441	1.489
14	1.142	0.590	1.694	1.140	0.626	1.654	0.925	0.380	1.470	0.967	0.424	1.511
15	1.133	0.564	1.703	1.153	0.622	1.683	0.934	0.360	1.507	0.970	0.404	1.536
16	1.130	0.543	1.716	1.164	0.617	1.710	0.938	0.337	1.538	0.972	0.385	1.560
17	1.130	0.528	1.733	1.173	0.611	1.736	0.947	0.320	1.574	0.975	0.367	1.583
18	1.137	0.519	1.756	1.182	0.604	1.759	0.954	0.302	1.606	0.977	0.349	1.604
19	1.150	0.516	1.783	1.189	0.596	1.781	0.960	0.284	1.636	0.978	0.331	1.625
20	1.165	0.516	1.814	1.195	0.588	1.802	0.965	0.266	1.664	0.979	0.313	1.645

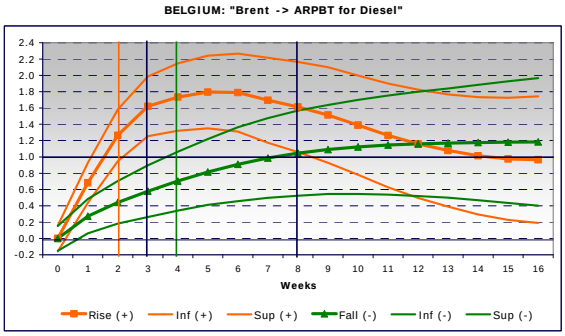
Illustration 36 – France: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Brent → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the price for Brent

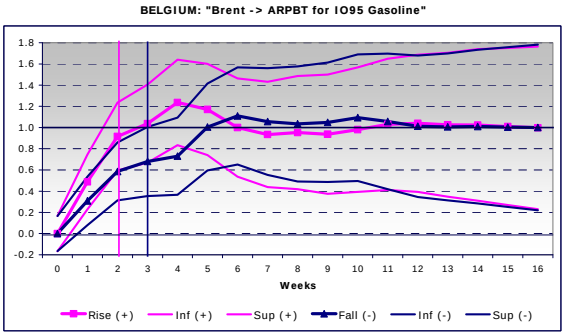




	FRANCE (33.5% MED & 66.5% NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	-0.092	-0.237	0.053	0.000	-0.107	0.107	-0.090	-0.236	0.057	0.000	-0.184	0.184
1	0.696	0.492	0.901	0.445	0.287	0.604	0.542	0.329	0.754	0.537	0.302	0.772
2	1.157	0.888	**1.427**	0.707	0.513	0.901	0.761	0.504	**1.019**	0.994	0.712	**1.276**
3	1.107	0.801	1.413	0.843	0.601	**1.085**	0.810	0.510	1.110	0.913	0.601	1.226
4	1.407	**1.068**	**1.745**	0.878	0.600	1.157	0.922	0.576	1.268	0.862	0.523	1.202
5	1.369	**1.004**	**1.735**	1.078	0.762	1.395	0.914	0.544	1.284	0.975	0.616	1.334
6	1.351	0.965	1.738	1.100	0.762	1.438	0.765	0.364	1.166	1.044	0.657	1.431
7	1.319	0.903	1.735	1.160	0.802	1.518	0.766	0.340	1.193	1.084	0.678	1.490
8	1.317	0.879	1.754	1.192	0.813	1.572	0.800	0.349	1.250	1.036	0.602	1.469
9	1.249	0.785	1.713	1.214	0.807	1.621	0.808	0.332	1.285	0.996	0.544	1.449
10	1.176	0.696	1.656	1.224	0.798	1.650	0.842	0.338	1.346	0.993	0.519	1.468
11	1.118	0.622	1.613	1.228	0.778	1.678	0.895	0.370	1.420	0.974	0.479	1.469
12	1.073	0.559	1.586	1.228	0.756	1.700	0.899	0.345	1.453	0.964	0.445	1.482
13	1.026	0.499	1.554	1.225	0.734	1.717	0.896	0.321	1.471	0.959	0.418	1.499
14	0.995	0.442	1.547	1.222	0.710	1.734	0.900	0.294	1.507	0.957	0.394	1.521
15	0.983	0.411	1.556	1.219	0.688	1.751	0.899	0.267	1.531	0.958	0.372	1.543
16	0.986	0.394	1.577	1.216	0.666	1.767	0.894	0.238	1.551	0.959	0.353	1.566
17	0.997	0.386	1.607	1.213	0.645	1.782	0.903	0.223	1.583	0.961	0.334	1.588
18	1.019	0.390	1.647	1.211	0.625	1.797	0.911	0.208	1.614	0.963	0.316	1.610
19	1.048	0.402	1.695	1.209	0.605	1.812	0.916	0.191	1.641	0.965	0.299	1.631
20	1.081	0.417	1.745	1.207	0.586	1.827	0.921	0.175	1.667	0.967	0.282	1.652

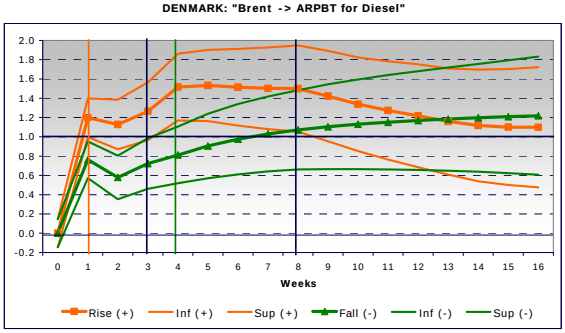
Illustration 37 – Belgium: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Brent → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the price for Brent

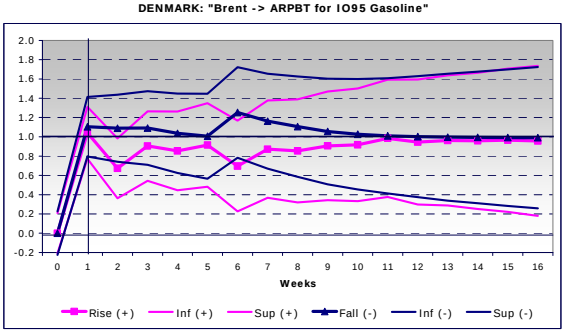




	BELGIUM (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.157	0.157	0.000	-0.152	0.152	0.000	-0.167	0.167	0.000	-0.165	0.165
1	0.682	0.436	0.928	0.274	0.063	0.485	0.487	0.230	0.745	0.309	0.080	0.537
2	1.265	0.948	**1.582**	0.443	0.182	0.704	0.915	0.595	**1.235**	0.586	0.312	0.860
3	1.620	**1.254**	**1.986**	0.580	0.263	0.896	1.037	0.669	1.405	0.680	0.353	**1.007**
4	1.734	**1.322**	**2.147**	0.703	0.342	**1.065**	1.236	0.834	1.639	0.730	0.366	1.094
5	1.796	**1.350**	**2.242**	0.815	0.412	1.218	1.170	0.740	1.600	1.006	0.596	1.415
6	1.789	**1.310**	**2.267**	0.910	0.457	1.363	1.000	0.536	1.465	1.110	0.652	1.567
7	1.695	**1.174**	**2.216**	0.987	0.499	1.475	0.935	0.438	1.432	1.056	0.553	1.560
8	1.612	**1.060**	**2.164**	1.047	0.524	1.569	0.953	0.419	1.487	1.035	0.491	1.578
9	1.514	0.929	2.099	1.091	0.545	1.637	0.937	0.375	1.499	1.049	0.486	1.612
10	1.390	0.782	1.997	1.123	0.545	1.700	0.980	0.393	1.568	1.094	0.497	1.690
11	1.263	0.627	1.898	1.145	0.537	1.752	1.031	0.412	1.649	1.058	0.419	1.697
12	1.160	0.497	1.824	1.160	0.520	1.799	1.040	0.393	1.687	1.013	0.345	1.680
13	1.078	0.390	1.766	1.170	0.501	1.839	1.027	0.348	1.705	1.006	0.314	1.699
14	1.014	0.294	1.733	1.177	0.469	1.884	1.024	0.310	1.738	1.010	0.286	1.734
15	0.976	0.227	1.724	1.181	0.435	1.927	1.009	0.268	1.750	1.004	0.251	1.758
16	0.966	0.190	1.743	1.184	0.401	1.966	0.997	0.231	1.764	1.000	0.219	1.781
17	0.978	0.175	1.781	1.186	0.368	2.003	0.998	0.206	1.789	1.001	0.193	1.809
18	1.006	0.176	1.835	1.187	0.336	2.038	1.002	0.187	1.818	1.001	0.167	1.835
19	1.046	0.191	1.901	1.188	0.304	2.072	1.003	0.164	1.842	1.000	0.141	1.860
20	1.094	0.215	1.974	1.188	0.273	2.103	1.006	0.144	1.867	1.000	0.116	1.884

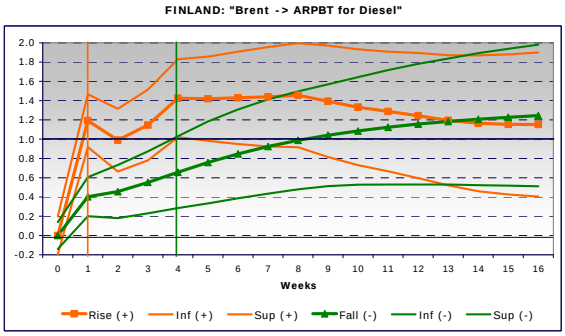
Illustration 38 – Denmark: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Brent → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the price for Brent

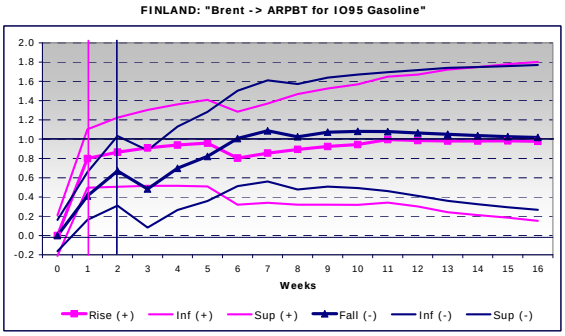




	DENMARK (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.146	0.146	0.000	-0.145	0.145	0.000	-0.208	0.208	0.000	-0.225	0.225
1	1.199	0.999	**1.399**	0.762	0.573	0.951	1.042	0.774	**1.310**	1.104	0.795	**1.414**
2	1.128	0.870	1.385	0.578	0.352	0.805	0.674	0.363	0.984	1.090	0.742	1.438
3	1.265	0.964	1.565	0.723	0.460	0.986	0.904	0.544	1.264	1.091	0.709	1.473
4	1.516	**1.171**	**1.862**	0.812	0.519	**1.106**	0.854	0.446	1.262	1.037	0.625	1.449
5	1.534	**1.164**	**1.903**	0.905	0.569	1.240	0.915	0.481	1.349	1.006	0.566	1.446
6	1.515	**1.117**	**1.913**	0.976	0.611	1.341	0.697	0.227	1.167	1.253	0.782	1.723
7	1.503	**1.080**	**1.927**	1.031	0.643	1.419	0.872	0.367	1.377	1.162	0.669	1.655
8	1.501	**1.053**	**1.948**	1.072	0.662	1.483	0.854	0.319	1.389	1.106	0.586	1.626
9	1.423	0.954	1.892	1.105	0.665	1.544	0.906	0.342	1.471	1.055	0.508	1.602
10	1.339	0.852	1.825	1.130	0.665	1.595	0.917	0.332	1.502	1.027	0.453	1.600
11	1.274	0.765	1.784	1.151	0.661	1.641	0.984	0.375	1.593	1.010	0.412	1.608
12	1.218	0.685	1.752	1.169	0.657	1.681	0.946	0.297	1.595	1.001	0.373	1.629
13	1.159	0.608	1.710	1.184	0.648	1.719	0.962	0.288	1.637	0.997	0.339	1.655
14	1.118	0.539	1.697	1.197	0.638	1.756	0.958	0.251	1.665	0.994	0.311	1.677
15	1.101	0.499	1.703	1.209	0.623	1.795	0.965	0.222	1.708	0.992	0.284	1.701
16	1.099	0.475	1.723	1.219	0.607	1.831	0.957	0.179	1.736	0.991	0.258	1.724
17	1.107	0.462	1.753	1.228	0.591	1.865	0.975	0.164	1.787	0.990	0.233	1.748
18	1.130	0.463	1.796	1.236	0.575	1.897	0.975	0.132	1.819	0.990	0.209	1.770
19	1.162	0.476	1.848	1.243	0.559	1.927	0.980	0.106	1.854	0.989	0.186	1.793
20	1.198	0.492	1.904	1.249	0.543	1.955	0.981	0.077	1.885	0.989	0.164	1.814

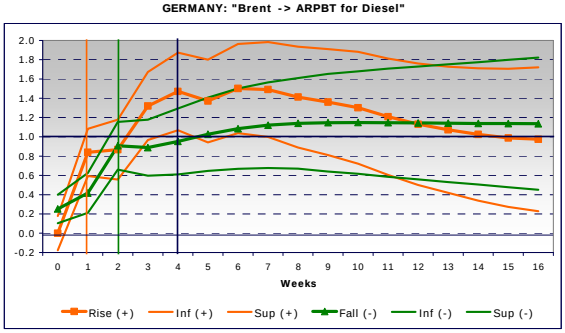
Illustration 39 – Finland: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Brent → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the price for Brent

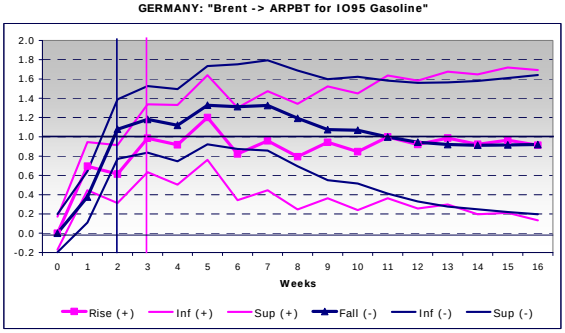




	FINLAND (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.197	0.197	0.000	-0.139	0.139	0.000	-0.211	0.211	0.000	-0.163	0.163
1	1.192	0.918	**1.466**	0.403	0.200	0.606	0.799	0.496	**1.103**	0.410	0.163	0.657
2	0.989	0.663	1.315	0.456	0.180	0.732	0.866	0.507	1.224	0.671	0.309	**1.033**
3	1.147	0.781	1.514	0.551	0.230	0.873	0.910	0.517	1.303	0.484	0.081	0.886
4	1.425	1.021	1.830	0.658	0.285	**1.030**	0.939	0.516	1.362	0.698	0.266	1.131
5	1.420	0.983	1.857	0.758	0.333	1.184	0.959	0.509	1.409	0.821	0.359	1.284
6	1.429	0.950	1.909	0.848	0.386	1.309	0.803	0.321	1.285	1.008	0.512	1.504
7	1.441	0.925	1.956	0.924	0.435	1.413	0.855	0.340	1.371	1.086	0.561	1.612
8	1.456	0.915	1.996	0.988	0.479	1.496	0.894	0.320	1.468	1.025	0.477	1.573
9	1.394	0.816	1.971	1.041	0.512	1.571	0.923	0.321	1.526	1.073	0.507	1.639
10	1.332	0.731	1.933	1.086	0.528	1.644	0.945	0.319	1.571	1.082	0.493	1.671
11	1.288	0.667	1.909	1.124	0.530	1.718	0.996	0.342	1.650	1.078	0.461	1.696
12	1.245	0.595	1.894	1.156	0.530	1.783	0.986	0.301	1.671	1.065	0.412	1.718
13	1.197	0.522	1.872	1.184	0.530	1.838	0.982	0.242	1.722	1.051	0.360	1.741
14	1.165	0.460	1.870	1.207	0.522	1.893	0.981	0.212	1.750	1.037	0.325	1.750
15	1.153	0.427	1.880	1.228	0.517	1.938	0.983	0.185	1.780	1.027	0.294	1.759
16	1.153	0.405	1.901	1.245	0.510	1.980	0.977	0.152	1.802	1.019	0.267	1.770
17	1.162	0.393	1.930	1.260	0.502	2.019	0.986	0.135	1.838	1.013	0.243	1.783
18	1.182	0.394	1.971	1.274	0.492	2.055	0.991	0.114	1.868	1.008	0.220	1.797
19	1.212	0.404	2.020	1.285	0.481	2.089	0.994	0.092	1.896	1.005	0.199	1.812
20	1.245	0.418	2.071	1.294	0.469	2.120	0.995	0.069	1.922	1.003	0.180	1.827

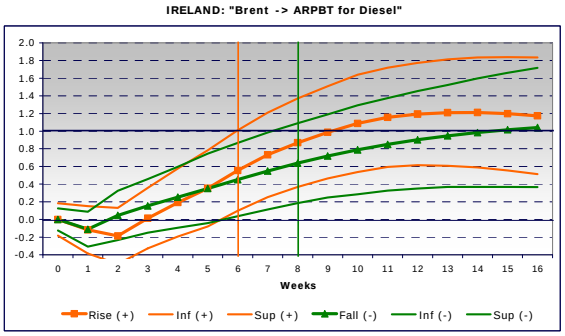
Illustration 40 – Germany: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Brent → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the price for Brent

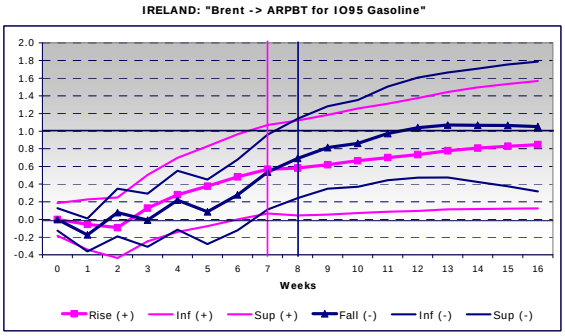




	GERMANY (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.177	0.177	0.251	0.103	0.399	0.000	-0.170	0.170	0.000	-0.198	0.198
1	0.839	0.594	**1.083**	0.418	0.211	0.624	0.696	0.445	0.946	0.375	0.109	0.642
2	0.867	0.556	1.178	0.907	0.659	**1.155**	0.614	0.313	0.914	1.079	0.771	**1.387**
3	1.320	0.968	1.672	0.888	0.597	1.179	0.985	0.633	**1.337**	1.181	0.836	1.526
4	1.472	**1.069**	**1.874**	0.952	0.610	1.295	0.918	0.504	1.331	1.120	0.746	1.494
5	1.371	0.942	1.801	1.027	0.646	1.408	1.201	0.761	1.641	1.328	0.922	1.734
6	1.501	**1.039**	**1.963**	1.084	0.667	1.501	0.822	0.342	1.302	1.313	0.874	1.752
7	1.491	0.999	1.984	1.121	0.676	1.565	0.959	0.445	1.472	1.325	0.857	1.793
8	1.412	0.889	1.936	1.140	0.670	1.610	0.794	0.246	1.343	1.192	0.695	1.688
9	1.361	0.811	1.911	1.147	0.641	1.654	0.943	0.362	1.524	1.075	0.550	1.599
10	1.302	0.722	1.883	1.149	0.617	1.680	0.845	0.240	1.451	1.069	0.514	1.624
11	1.209	0.605	1.813	1.147	0.585	1.708	0.999	0.363	1.636	0.997	0.411	1.584
12	1.130	0.500	1.760	1.144	0.559	1.729	0.919	0.256	1.583	0.945	0.330	1.560
13	1.074	0.419	1.728	1.141	0.531	1.752	0.986	0.297	1.676	0.920	0.277	1.564
14	1.025	0.338	1.711	1.139	0.505	1.773	0.923	0.197	1.649	0.914	0.248	1.579
15	0.989	0.272	1.706	1.137	0.477	1.798	0.966	0.212	1.719	0.915	0.221	1.610
16	0.975	0.229	1.721	1.136	0.450	1.823	0.913	0.133	1.694	0.920	0.198	1.642
17	0.979	0.204	1.753	1.136	0.425	1.846	0.948	0.141	1.754	0.924	0.175	1.673
18	0.994	0.192	1.796	1.135	0.401	1.870	0.924	0.092	1.755	0.928	0.153	1.702
19	1.019	0.190	1.847	1.135	0.377	1.892	0.947	0.091	1.804	0.930	0.131	1.730
20	1.051	0.197	1.905	1.135	0.355	1.915	0.931	0.051	1.811	0.932	0.109	1.756

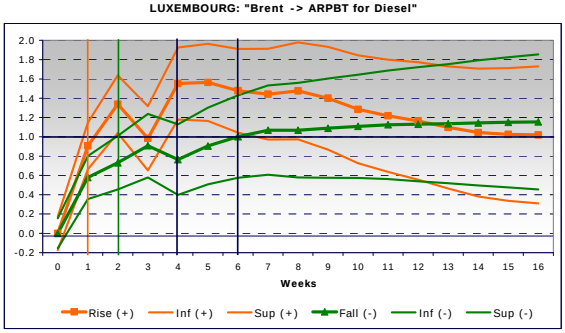
Illustration 41 – Ireland: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Brent → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the price for Brent

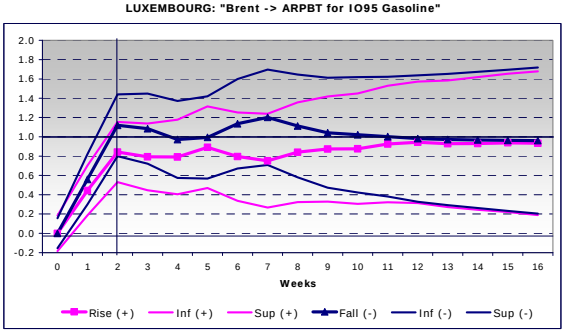




	IRELAND (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.183	0.183	0.000	-0.125	0.125	0.000	-0.186	0.186	0.000	-0.127	0.127
1	-0.117	-0.385	0.151	-0.110	-0.307	0.086	-0.057	-0.341	0.228	-0.175	-0.360	0.010
2	-0.187	-0.506	0.132	0.046	-0.232	0.324	-0.092	-0.435	0.250	0.078	-0.192	0.347
3	0.014	-0.328	0.357	0.154	-0.150	0.458	0.129	-0.248	0.505	-0.007	-0.308	0.293
4	0.191	-0.194	0.577	0.252	-0.094	0.598	0.279	-0.140	0.698	0.218	-0.116	0.551
5	0.353	-0.079	0.784	0.351	-0.042	0.745	0.377	-0.076	0.830	0.087	-0.279	0.452
6	0.554	0.099	**1.010**	0.451	0.036	0.867	0.483	0.001	0.965	0.278	-0.122	0.678
7	0.731	0.253	1.210	0.548	0.112	0.984	0.568	0.067	**1.069**	0.537	0.112	0.962
8	0.870	0.369	1.371	0.638	0.185	**1.091**	0.583	0.045	1.120	0.692	0.243	**1.141**
9	0.987	0.465	1.509	0.719	0.248	1.190	0.619	0.054	1.184	0.815	0.348	1.282
10	1.088	0.537	1.639	0.789	0.285	1.294	0.665	0.073	1.256	0.862	0.371	1.354
11	1.157	0.595	1.719	0.850	0.327	1.374	0.701	0.089	1.312	0.974	0.443	1.505
12	1.194	0.615	1.773	0.903	0.352	1.453	0.735	0.096	1.375	1.040	0.474	1.607
13	1.211	0.607	1.814	0.947	0.369	1.524	0.779	0.115	1.443	1.069	0.475	1.664
14	1.212	0.589	1.835	0.984	0.369	1.598	0.808	0.119	1.496	1.066	0.425	1.707
15	1.198	0.556	1.839	1.015	0.369	1.661	0.828	0.123	1.533	1.064	0.375	1.754
16	1.174	0.513	1.834	1.042	0.366	1.717	0.847	0.126	1.568	1.052	0.316	1.787
17	1.147	0.469	1.825	1.064	0.359	1.768	0.862	0.126	1.599	1.034	0.256	1.813
18	1.122	0.427	1.818	1.083	0.351	1.815	0.873	0.121	1.624	1.015	0.195	1.834
19	1.100	0.388	1.813	1.099	0.340	1.857	0.884	0.118	1.651	1.000	0.142	1.858
20	1.084	0.355	1.813	1.112	0.327	1.896	0.895	0.114	1.676	0.986	0.091	1.881

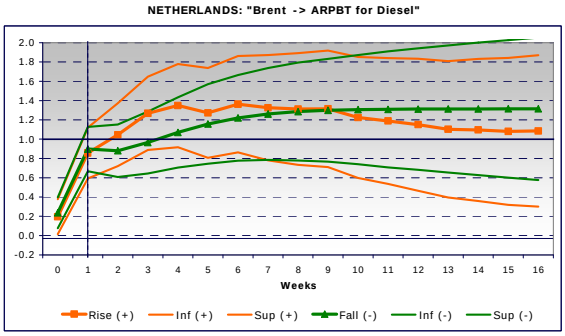
Illustration 42 – Luxembourg: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Brent → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the price for Brent

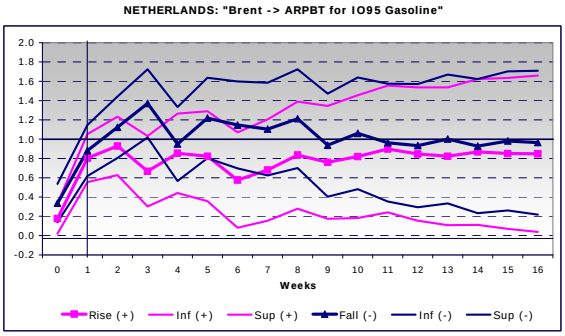




	LUXEMBOURG (NWE)											
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.175	0.175	0.000	-0.155	0.155	0.000	-0.184	0.184	0.000	-0.155	0.155
1	0.906	0.664	**1.148**	0.578	0.356	0.801	0.443	0.185	0.701	0.559	0.299	0.819
2	1.338	**1.040**	**1.636**	0.732	0.453	**1.010**	0.843	0.532	**1.153**	1.120	0.799	**1.440**
3	0.984	0.652	1.317	0.907	0.577	1.237	0.793	0.447	1.138	1.084	0.722	1.447
4	1.553	**1.179**	**1.926**	0.764	0.398	1.129	0.791	0.405	1.178	0.972	0.573	1.371
5	1.564	**1.164**	**1.963**	0.905	0.508	1.301	0.891	0.468	1.315	0.993	0.567	1.420
6	1.477	**1.042**	**1.912**	1.002	0.575	1.429	0.795	0.337	1.252	1.136	0.672	1.600
7	1.442	0.972	1.913	1.069	0.606	1.532	0.752	0.266	1.238	1.202	0.708	1.696
8	1.476	0.973	1.980	1.069	0.578	1.559	0.840	0.323	1.357	1.113	0.580	1.646
9	1.400	0.868	1.931	1.089	0.575	1.604	0.873	0.328	1.418	1.042	0.472	1.612
10	1.285	0.727	1.844	1.109	0.574	1.643	0.877	0.305	1.448	1.022	0.424	1.619
11	1.218	0.636	1.800	1.124	0.562	1.687	0.925	0.321	1.529	1.002	0.382	1.623
12	1.165	0.557	1.772	1.130	0.538	1.721	0.943	0.313	1.572	0.982	0.327	1.637
13	1.097	0.464	1.731	1.136	0.519	1.754	0.928	0.271	1.585	0.972	0.293	1.651
14	1.044	0.382	1.707	1.144	0.495	1.792	0.931	0.243	1.618	0.967	0.262	1.673
15	1.025	0.338	1.711	1.150	0.476	1.825	0.938	0.221	1.655	0.964	0.232	1.695
16	1.020	0.310	1.730	1.155	0.455	1.856	0.934	0.189	1.678	0.961	0.204	1.718
17	1.024	0.291	1.757	1.160	0.435	1.885	0.938	0.166	1.709	0.959	0.178	1.741
18	1.042	0.288	1.797	1.164	0.415	1.913	0.947	0.150	1.744	0.959	0.154	1.764
19	1.075	0.299	1.850	1.168	0.396	1.940	0.950	0.127	1.772	0.958	0.130	1.786
20	1.110	0.314	1.907	1.172	0.377	1.966	0.951	0.104	1.797	0.958	0.107	1.808

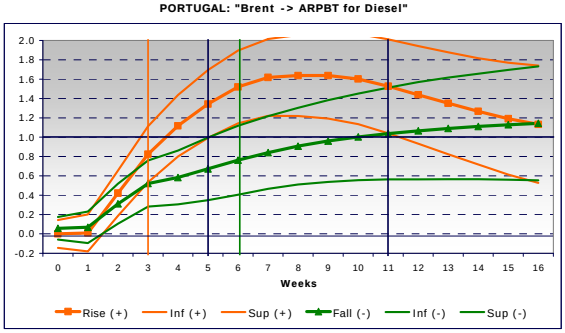
Illustration 43 – Netherlands: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Brent → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the price for Brent

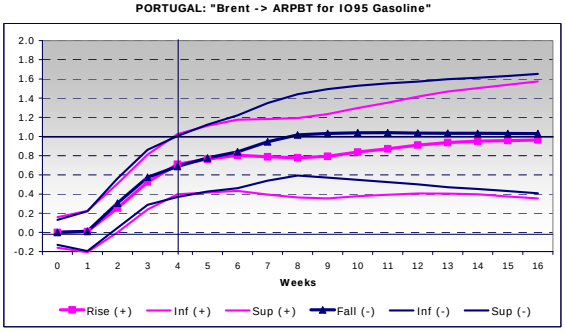




	NETHERLANDS (NWE)											
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.196	0.014	0.377	0.237	0.078	0.397	0.177	0.020	0.334	0.336	0.137	0.535
1	0.857	0.592	**1.121**	0.898	0.669	**1.128**	0.803	0.554	**1.052**	0.882	0.617	**1.147**
2	1.046	0.720	1.372	0.880	0.609	1.152	0.930	0.627	1.232	1.124	0.805	1.442
3	1.269	0.888	1.649	0.966	0.646	1.286	0.667	0.303	1.032	1.371	1.018	1.724
4	1.349	0.918	1.780	1.070	0.706	1.434	0.854	0.443	1.265	0.950	0.567	1.333
5	1.272	0.807	1.737	1.158	0.745	1.571	0.822	0.356	1.289	1.219	0.803	1.636
6	1.363	0.863	1.862	1.221	0.776	1.665	0.576	0.081	1.071	1.147	0.697	1.597
7	1.326	0.780	1.871	1.262	0.786	1.737	0.681	0.156	1.205	1.105	0.624	1.586
8	1.313	0.734	1.891	1.286	0.779	1.793	0.835	0.280	1.390	1.212	0.701	1.724
9	1.315	0.711	1.918	1.299	0.767	1.831	0.759	0.174	1.344	0.937	0.402	1.472
10	1.225	0.599	1.852	1.307	0.741	1.872	0.820	0.183	1.456	1.061	0.482	1.640
11	1.189	0.538	1.841	1.310	0.709	1.912	0.898	0.240	1.556	0.964	0.353	1.574
12	1.151	0.466	1.835	1.312	0.682	1.942	0.846	0.156	1.536	0.933	0.294	1.572
13	1.103	0.397	1.810	1.313	0.655	1.971	0.823	0.108	1.537	1.002	0.334	1.670
14	1.096	0.360	1.833	1.314	0.627	2.001	0.868	0.112	1.623	0.928	0.232	1.623
15	1.081	0.320	1.843	1.314	0.601	2.028	0.852	0.069	1.635	0.982	0.261	1.703
16	1.085	0.300	1.871	1.315	0.576	2.054	0.849	0.040	1.659	0.964	0.219	1.710
17	1.107	0.298	1.916	1.316	0.552	2.079	0.877	0.042	1.713	0.951	0.182	1.721
18	1.125	0.294	1.956	1.316	0.529	2.103	0.885	0.025	1.746	0.978	0.185	1.771
19	1.159	0.306	2.012	1.317	0.507	2.126	0.878	-0.006	1.763	0.953	0.137	1.768
20	1.193	0.318	2.068	1.317	0.485	2.149	0.891	-0.017	1.800	0.970	0.132	1.807

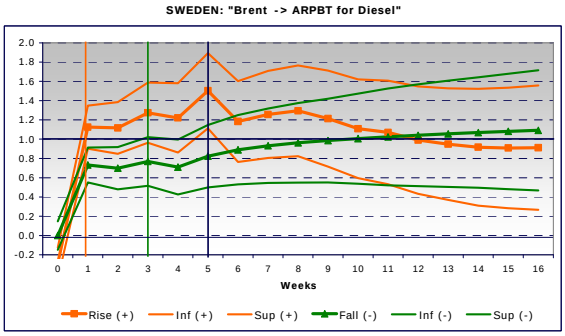
Illustration 44 – Portugal: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Brent → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the price for Brent

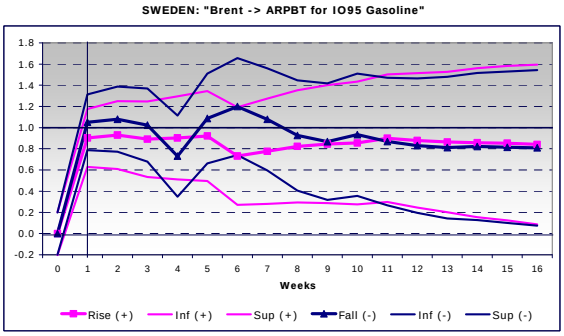




	PORTUGAL (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.144	0.144	0.058	-0.058	0.175	0.000	-0.160	0.160	0.000	-0.130	0.130
1	0.010	-0.181	0.200	0.068	-0.095	0.231	0.008	-0.207	0.224	0.012	-0.196	0.220
2	0.421	0.187	0.656	0.312	0.105	0.518	0.254	0.001	0.507	0.305	0.047	0.562
3	0.824	0.534	**1.113**	0.521	0.283	0.759	0.525	0.239	0.811	0.574	0.287	0.861
4	1.117	0.800	1.435	0.583	0.305	0.861	0.711	0.398	**1.025**	0.687	0.368	**1.006**
5	1.343	0.992	1.694	0.672	0.348	0.997	0.764	0.416	1.111	0.775	0.426	1.123
6	1.519	1.143	1.895	0.762	0.406	**1.119**	0.805	0.433	1.176	0.840	0.460	1.220
7	1.618	1.221	2.015	0.841	0.466	1.217	0.788	0.394	1.182	0.944	0.540	1.349
8	1.638	1.220	2.056	0.907	0.510	1.304	0.778	0.364	1.192	1.016	0.592	1.439
9	1.637	1.192	2.082	0.960	0.538	1.382	0.794	0.354	1.234	1.032	0.570	1.493
10	1.601	1.134	2.069	1.003	0.556	1.450	0.837	0.377	1.297	1.038	0.547	1.529
11	1.526	1.042	2.010	1.038	0.564	1.511	0.872	0.392	1.352	1.040	0.526	1.554
12	1.437	0.932	1.943	1.066	0.564	1.569	0.910	0.405	1.416	1.036	0.501	1.572
13	1.351	0.824	1.877	1.090	0.566	1.615	0.937	0.404	1.470	1.034	0.471	1.597
14	1.267	0.718	1.816	1.111	0.565	1.656	0.951	0.397	1.505	1.032	0.453	1.612
15	1.191	0.613	1.770	1.128	0.560	1.696	0.957	0.374	1.539	1.031	0.430	1.632
16	1.133	0.527	1.739	1.143	0.554	1.733	0.964	0.354	1.574	1.030	0.409	1.651
17	1.095	0.463	1.728	1.156	0.546	1.767	0.969	0.334	1.605	1.030	0.388	1.671
18	1.076	0.418	1.735	1.167	0.537	1.798	0.977	0.316	1.637	1.029	0.369	1.690
19	1.075	0.392	1.757	1.177	0.527	1.827	0.985	0.301	1.670	1.029	0.350	1.709
20	1.089	0.383	1.795	1.186	0.517	1.854	0.994	0.286	1.702	1.029	0.332	1.727

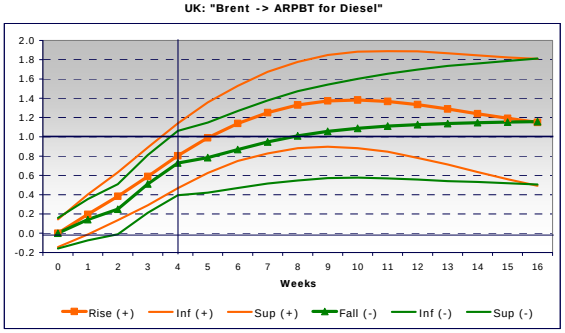
Illustration 45 – Sweden: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Brent → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the price for Brent

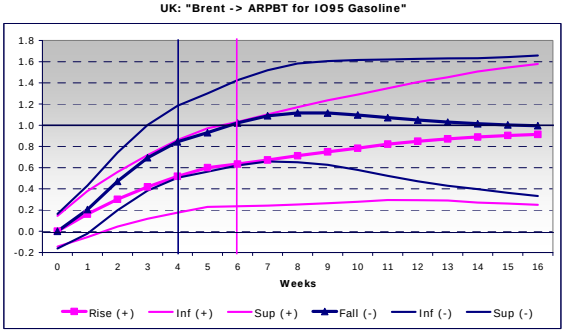




	SWEDEN (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	-0.288	-0.449	-0.126	0.000	-0.148	0.148	0.000	-0.203	0.203	0.000	-0.198	0.198
1	1.126	0.902	**1.349**	0.732	0.551	0.913	0.903	0.629	**1.176**	1.051	0.788	**1.313**
2	1.117	0.848	1.385	0.699	0.479	0.919	0.930	0.611	1.250	1.079	0.772	1.386
3	1.275	0.963	1.587	0.769	0.516	**1.021**	0.891	0.535	1.247	1.024	0.678	1.369
4	1.221	0.861	1.581	0.711	0.426	0.996	0.903	0.512	1.294	0.732	0.348	1.115
5	1.503	**1.112**	**1.894**	0.823	0.500	1.147	0.921	0.497	1.346	1.086	0.663	1.510
6	1.184	0.764	1.603	0.890	0.531	1.250	0.732	0.272	1.193	1.198	0.741	1.655
7	1.257	0.805	1.708	0.932	0.546	1.319	0.777	0.280	1.273	1.078	0.595	1.560
8	1.294	0.823	1.766	0.962	0.549	1.375	0.823	0.294	1.352	0.926	0.406	1.447
9	1.214	0.716	1.713	0.985	0.552	1.419	0.845	0.288	1.402	0.868	0.318	1.418
10	1.108	0.595	1.621	1.006	0.538	1.473	0.855	0.276	1.435	0.933	0.357	1.510
11	1.071	0.533	1.609	1.024	0.522	1.526	0.901	0.298	1.503	0.869	0.266	1.471
12	0.991	0.433	1.548	1.040	0.512	1.569	0.879	0.245	1.514	0.831	0.196	1.465
13	0.948	0.369	1.527	1.056	0.505	1.607	0.864	0.202	1.526	0.811	0.144	1.479
14	0.917	0.310	1.523	1.069	0.496	1.643	0.858	0.154	1.561	0.822	0.127	1.516
15	0.909	0.283	1.535	1.081	0.482	1.680	0.853	0.125	1.582	0.815	0.100	1.529
16	0.912	0.267	1.557	1.092	0.469	1.715	0.841	0.088	1.594	0.809	0.075	1.543
17	0.927	0.263	1.591	1.101	0.454	1.748	0.846	0.069	1.623	0.804	0.051	1.556
18	0.947	0.265	1.629	1.109	0.440	1.779	0.846	0.047	1.646	0.803	0.031	1.574
19	0.982	0.282	1.682	1.116	0.425	1.808	0.843	0.021	1.665	0.800	0.010	1.589
20	1.019	0.301	1.736	1.123	0.410	1.835	0.839	-0.005	1.683	0.797	-0.010	1.604

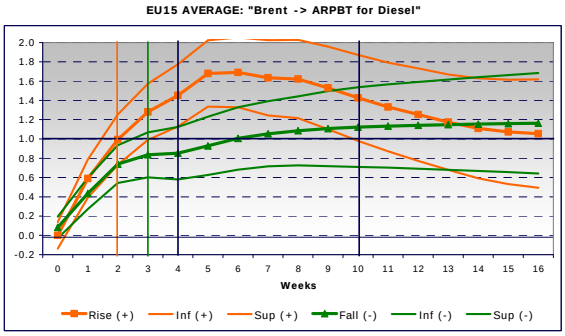
Illustration 46 – UK: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Brent → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the price for Brent

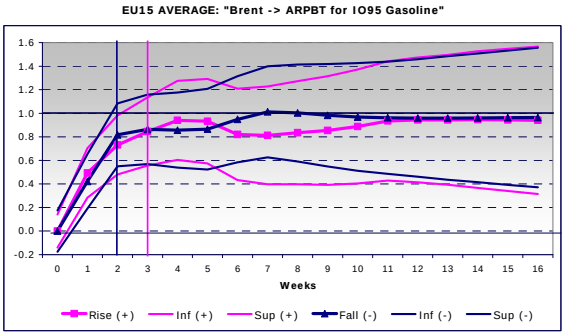




	UK (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.144	0.144	0.000	-0.159	0.159	0.000	-0.146	0.146	0.000	-0.163	0.163
1	0.195	-0.012	0.403	0.141	-0.074	0.355	0.162	-0.055	0.380	0.205	-0.022	0.432
2	0.384	0.136	0.631	0.249	-0.011	0.509	0.301	0.044	0.559	0.470	0.198	0.743
3	0.589	0.290	0.888	0.511	0.210	0.811	0.419	0.118	0.720	0.694	0.383	**1.004**
4	0.803	0.466	**1.141**	0.728	0.394	**1.062**	0.518	0.175	0.860	0.844	0.505	1.183
5	0.990	0.624	1.357	0.784	0.420	1.148	0.600	0.229	0.971	0.931	0.562	1.299
6	1.139	0.749	1.530	0.868	0.468	1.268	0.634	0.236	**1.032**	1.023	0.620	1.425
7	1.251	0.828	1.674	0.947	0.516	1.377	0.672	0.242	1.103	1.089	0.659	1.519
8	1.331	0.883	1.778	1.010	0.546	1.474	0.712	0.253	1.170	1.117	0.652	1.583
9	1.373	0.896	1.850	1.056	0.572	1.541	0.749	0.264	1.235	1.115	0.627	1.604
10	1.382	0.881	1.884	1.089	0.576	1.602	0.784	0.278	1.289	1.097	0.578	1.616
11	1.367	0.845	1.889	1.111	0.568	1.654	0.822	0.295	1.348	1.072	0.524	1.621
12	1.335	0.782	1.888	1.127	0.556	1.697	0.850	0.292	1.407	1.049	0.471	1.627
13	1.290	0.713	1.867	1.138	0.541	1.735	0.871	0.290	1.453	1.029	0.428	1.630
14	1.240	0.636	1.845	1.147	0.533	1.761	0.889	0.271	1.507	1.014	0.397	1.631
15	1.192	0.560	1.824	1.153	0.519	1.787	0.903	0.262	1.545	1.003	0.363	1.644
16	1.150	0.492	1.808	1.159	0.505	1.812	0.914	0.249	1.578	0.996	0.333	1.659
17	1.116	0.433	1.800	1.163	0.491	1.835	0.924	0.238	1.611	0.991	0.306	1.675
18	1.094	0.386	1.802	1.167	0.476	1.857	0.934	0.226	1.641	0.987	0.282	1.693
19	1.083	0.352	1.814	1.170	0.462	1.878	0.942	0.214	1.670	0.985	0.259	1.711
20	1.083	0.329	1.837	1.173	0.447	1.898	0.949	0.201	1.697	0.984	0.238	1.729

Illustration 47 – EU15 average: IRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Brent → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the price for Brent





	EU15 AVERAGE											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.	IRF	Inf.	Sup.
0	0.000	-0.138	0.138	0.083	-0.028	0.194	0.000	-0.141	0.141	0.000	-0.176	0.176
1	0.590	0.392	0.789	0.435	0.272	0.599	0.493	0.283	0.703	0.422	0.191	0.652
2	0.994	0.733	**1.254**	0.740	0.544	0.936	0.731	0.480	0.982	0.817	0.550	**1.083**
3	1.281	0.990	1.573	0.836	0.602	**1.070**	0.846	0.556	**1.136**	0.863	0.568	1.159
4	1.453	**1.130**	**1.776**	0.853	0.581	1.126	0.940	0.604	1.275	0.857	0.538	1.175
5	1.679	**1.336**	**2.023**	0.928	0.626	1.230	0.933	0.574	1.292	0.865	0.523	1.207
6	1.691	**1.330**	**2.053**	1.005	0.682	1.329	0.821	0.433	1.209	0.948	0.582	1.314
7	1.635	**1.244**	**2.025**	1.054	0.716	1.392	0.813	0.398	1.227	1.012	0.625	1.398
8	1.622	**1.215**	**2.028**	1.085	0.727	1.443	0.835	0.398	1.273	1.003	0.591	1.414
9	1.531	**1.102**	**1.960**	1.107	0.717	1.497	0.854	0.393	1.315	0.983	0.548	1.418
10	1.426	0.980	1.871	1.123	0.710	1.535	0.888	0.404	1.372	0.969	0.511	1.426
11	1.332	0.872	1.793	1.134	0.702	1.566	0.934	0.428	1.441	0.962	0.485	1.438
12	1.253	0.774	1.733	1.142	0.692	1.592	0.944	0.414	1.474	0.959	0.460	1.459
13	1.174	0.679	1.668	1.149	0.680	1.617	0.944	0.393	1.495	0.960	0.435	1.484
14	1.111	0.592	1.630	1.154	0.668	1.641	0.946	0.366	1.526	0.961	0.415	1.507
15	1.073	0.532	1.614	1.159	0.655	1.664	0.944	0.341	1.547	0.962	0.393	1.532
16	1.056	0.494	1.618	1.164	0.642	1.686	0.941	0.315	1.567	0.964	0.371	1.556
17	1.053	0.471	1.636	1.168	0.630	1.706	0.947	0.299	1.594	0.965	0.350	1.579
18	1.066	0.464	1.668	1.172	0.617	1.726	0.953	0.284	1.622	0.966	0.330	1.602
19	1.092	0.471	1.714	1.175	0.605	1.746	0.957	0.268	1.646	0.967	0.311	1.623
20	1.126	0.486	1.765	1.178	0.592	1.764	0.961	0.251	1.670	0.968	0.291	1.644

Glossary

AdC – Portuguese Competition Authority (*Autoridade da Concorrência*).

ANAREC – National Association of Fuel Wholesalers (*Associação Nacional de Revendedores de Combustíveis*).

APA – Aveiro Port Authority (*Administração do Porto de Aveiro*).

APDL – Leixões Port Authority (*Administração do Porto de Leixões*).

APL – Lisbon Port Authority (*Administração do Porto de Lisboa*).

ARA – The Amsterdam/Rotterdam/Antwerp region, used as a reference for Platt quotations.

APETRO – Portuguese Association of Oil Companies (*Associação Portuguesa de Empresas Petrolíferas*).

API – American Petroleum Institute.

APS –Sines Port Authority (*Administração do Porto de Sines*).

APSS –Setúbal and Sesimbra Port Authority (*Administração dos Portos de Setúbal e Sesimbra*).

bbl – Barrel – a measure of the volume of crude and derivatives. One barrel is 42 American gallons (approx. 159 ltrs). On average, a ton corresponds to 7.33 bbl of crude, although accurate conversion depends on the specific characteristics of the oil.

ECB – European Central Bank.

Brent – "Brent blend" – the most common North Sea oil. The density is around 37.5 on the API scale. Technically, it is a mixture of Shell UK (Brent field) and BP (Ninian field).

EC – European Commission.

CIEC – Special Consumption Tax Code (*Código de Impostos Especiais de Consumo*).

CIF – *Cost, insurance, and freight*.

CLC – *Companhia Logística de Combustíveis, S.A.*.

CLH – *Compañía Logística de Hidrocarburos, S.A.*.

COCO – "*Company Owned Company Operated*"

CODO - "*Company Owned Dealer Operated*"

Crack spreads – Difference between the price of crude oil and the price of the final product.

DGEG – General Diretorate of Energy and Geology (*Direcção Geral de Energia e Geologia*).

DODO - "*Dealer Owned Dealer Operated*"

EGREP – The body in Portugal that is responsible for managing oil reserves (*Entidade Gestora de Reservas Estratégicas de Produtos Petrolíferos*). It was set up through Decree Law no. 339-D/2001, of 28 December (*cf.* http:// www.egrep.pt).

ERSE – The energy regulator for Portugal (*Entidade Reguladora dos Serviços Energéticos*).

EC – European Commission

EC Treaty – The founding treaty of the European Community.

EU or **EU 27** – The 27-member European Union.

EU 15 – The 15-member European Union (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, United Kingdom)

FOB – *Free on board*, the cost of the product loaded for export.

Complexity Indices: Nelson (NCI) and Solomon (SCI) – The Nelson index is a measurement of the capacity of an oil refinery for secondary conversion following the first distillation. The average European NCI is 6.5 and the US is 9.5. Solomon Associates is a company that operates in this sector, and they did the first comparative analysis of the performance of oil refineries in 1980. The study was based on the US market but was extended to Europe in 1982 and to Canada and the Asian Pacific in 1983. The aim of the study was to analyse all those issues that had an impact on commercial success, including the selection of raw materials, the product mix, rates of use at the refineries, main parameters of the operations and all the components of operating costs. Each process is then classified on an array of references to look at its competitive position at each level of the process. The study is widely used in the industry, although it is confidential and is only made available to those refineries that provide information for the yearly update. In 1973, W. L. Nelson published his attempt to relate the levels of performance of refineries with their capacities and processing techniques. He developed a complexity factor for the process that was solely related to the levels of investment in the plants. He assigned the level 1.0 to the basic distillation of crude and could then allocate levels of complexity to other major pieces of refining equipment (either more

or less complex). As an exmaple, coking could be compared be compared in terms of the cost of investment, compared with the costs of distilling crude. His approach presupposes that the levels of manpower, maintenance costs, energy consumption and basically all the elements in the performance of the refinery can be related to the levels of investment.

IEA – International Energy Agency

IO – Octane Index (*Índice de Octanas*)

ISP – Special tax on oil products, corresponding to the first fiscal component on the price of the product. It has to be settled when the products enter the commercial circuit for consumption on the domesic market. This means at wholesale level, whether the products are produced in the domestic refineries or are imported from third countries or from another member state of the EU (see subsection 3.5.1. above).

LdC – The Portuguese Competition Law (Law no. 18/2003, of 11 June).

LPG – Liquid Petroleum Gas.

kb/d – Thousands of barrels per day.

MED – This is used to refer to the Lavera/Genova region, serving as a reference for the Platts MED quotations for the Mediterranean region.

mb/d – Millions of barrels per day.

MA3 – Three-month moving average (the average of the last three months).

MA12 – Twelve-month moving average (the average of the last twelve months).

NWE – This is used to refer to the north western Europe region, serving as a reference for the Platts NWE quotations.

NYMEX – *New York Mercantile Exchange*.

PCA – Portuguese Competition Authority (AdC is the acronym in Portuguese)

Range of prices – Difference between the highest and the lowest price.

Spot prices – Prices at the time, as opposed to futures.

SNGN – National System of Natural Gas (*Sistema Nacional de Gás Natural*).

SPN – National Oil System (*Sistema Petrolífero Nacional*).

TGLS – Sines Liquid Bulk Port Terminal (*Terminal de Graneis Líquidos de Sines*).

TOGL – Galp Leça Oil Terminal (*Terminal Oceânico Galp Leça*).

TPL – Leixões Oil Terminal (*Terminal Petroleiro de Leixões*).

USAC – United States Atlantic Coast

USD – United States dollars.

VAT – Value added tax, applied to transactions along the value chain, with deductions made by the economic agents involved so that when there are sales (wholesale or retail), they settle the tax on their margins (see subsection 3.5.2. above).

WTI – West Texas Intermediate crude oil – type of crude that is used as a reference for the price of oil in the light sweet crude futures contracts on the NYMEX.