Asymmetries in the adjustment of motor diesel and gasoline pump prices in Europe

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Abstract

Gasoline prices are said to take longer to decrease and at a slower rate when crude oil prices fall than they do to increase when crude oil prices rise. In this paper I analyze to what extent this asymmetry phenomenon can be identified across all EU15 Member States, plus the EU15 average, and I allow for a comparative analysis between IO95 gasoline and motor diesel. I follow previous approaches by disentangling between the two major channels of pump price formation in Europe, namely the international channel from Brent to Platts (ex-refinery) prices and the domestic channels from Platts to average pump prices before tax. I consider weekly data over the period 2004-2008 and follow a previously proposed co-integration based econometric approach. Results strongly suggest the existence of asymmetries in the international channel for diesel, where there is also evidence of overshooting, but not for gasoline. On the domestic channels, the evidence in favour of asymmetries depends on the considered Member State and type of fuel.

Keywords: Gasoline and Diesel pump prices; Brent and Platts (ex-refinery) prices; Asymmetric adjustment; Delay and Amplitude of adjustment

JEL classification: C22; D40; F10; Q40

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1. Introduction

From January 2004 to the end of June 2008, there was a significant upward movement of crude (oil) prices. In the beginning of 2004, the reference prices for crude, namely the oil barrel (bbl) of Brent (1-month futures in London) and of the WTI (West Texas Intermediate) in the NYMEX, were US$30.14/bbl (€23.93/bbl at that day's closing exchange rate) and US$32.51/bbl (€25.82/bbl) respectively. On 2008 July 3, these prices reached their all-time highs of US$144.88/bbl (€91.21/bbl at that day's closing exchange rate) and US$145.31/bbl (€91.48/bbl) respectively. This rise was followed by a strong downward movement, with those prices reaching US$37.54/bbl (€26.80/bbl) and US$30.28/bbl (€21.66/bbl) respectively by the end of 2008 (December 23 and 24).

In spite of the several products that can be derived from crude oil, from crude-related fuels to different types of chemicals, periods of high crude price volatility assume particular relevance given the effects they have on prices drivers pay for motor liquid fuels (gasoline in the US and gasoline and motor diesel in Europe). During these periods, the common belief that motor liquid fuel prices are sticky (to fall) when crude prices fall but adjust quite fast upward when crude prices rise tends to be reinforced. Despite how much this common belief may be truly verified, it neglects the fact that gasoline and motor diesel are, like crude oil, traded in international markets. Hence, domestic prices for these liquid fuels do not only depend on crude prices but also on their own reference international prices.

In particular, as several US refineries, from the Chicago area to the Atlantic, West, and the Gulf of Mexico coasts, follow the so-called Platts reference prices for gasoline and this product's price in other US mercantile exchange markets for fuels (such as the 1-month NYMEX futures), so do European ex-refinery prices follow the European Platts (CIF) reference prices. European domestic prices for motor diesel and gasoline are thus related to the European Platts (reference ex-refinery) prices and the price for Brent (the reference crude for Europe).

In this paper, I assess, on empirical grounds and across all the Member States of the European Union 15 (EU15), plus the EU15 average, whether pump prices for the most important motor diesel and gasoline types in the EU – standard motor diesel and 95-octane (IO95) gasoline – adjust downwards with the same celerity and rate to Brent and Platts prices falls as they do upward when these reference prices go up.

This asymmetry phenomenon was detected by Bacon (1991) in the adjustment of UK retail prices for gasoline to the prices for both Brent and the UK Platts. Bacon named this phenomenon as "Rockets & Feathers", in that prices tend to rise like rockets when costs go up and fall like feathers when costs come down. Other more recent contributions have tackled the same issue in retail sales of gasoline (*v.g.*, Borenstein & Shepard, 1996; Borenstein *et al.*, 1997; and Honarvar, 2009 in the case of the US; Galeotti *et al.*, 2003 in five European countries; Wlazlowski, 2003 in the UK; and Deltas, 2007 in 48 contiguous US States with a further assessment of the relation between asymmetries and local market power). Yet, this phenomenon is not specific to the gasoline or oil sectors, but may as well characterize other economic sectors, concentrated or not (as suggested by, *v.g.*, Peltzman, 2000; Eckert, 2002; Lewis, 2005; Cabral & Fishman, 2008; Tappata, 2008; and Yang & Ye, 2008).

The existing empirical literature on the asymmetry phenomenon has been subjected to several criticisms. In particular, Geweke (2004) argues that the existing evidence in favour or against asymmetries depends on the type of data and econometric methodologies considered as well as on time and spatial aggregation issues which may amplify or mitigate its statistical significance. In spite of his criticisms of this literature and, in particular, on Borenstein *et al.*'s (1997) approach, with these latter being related, mostly, to the lack of a due economic interpretation to support their findings, Geweke argues that this methodology is the one in the literature which seems more adequate for the analysis of this phenomenon.

Borenstein *et al.* (1997) propose a co-integration type of modelling of the asymmetry phenomenon which establishes a symmetric and common long run path (common stochastic trend) between price and cost series but allowing for possible asymmetries in the short to medium run adjustments of prices to cost changes. This approach is motivated by the fact – consistent with gasoline and oil price movements – that prices and relevant (marginal or variable) cost series are, in general, not time stationary but exhibit accentuated phases of rises and falls over time and tend to move together in the long run, though the adjustment process of price to cost changes may present short to medium run "Rockets & Feathers"-type of asymmetries.

Moreover, rather than assessing the way shocks on crude prices are directly passed-through to retail prices, in analogy with most of the existing literature (including Bacon, 1991), Borenstein *et al.*'s (1997) disentangle between the two major channels of retail gasoline price formation, namely the foreign or international channel from crude to ex-refinery (or ex-terminal) prices and the domestic channel from ex-refinery to retail prices. The distinction between these two channels is also fundamental because the explanations related to the possible existence of the asymmetry phenomenon may be different depending on the considered channel.

Whilst most of the literature focuses on explanations for asymmetries at the retail level (*v.g.*, questions of local market power in Deltas, 2007 and of consumers' searching costs and learning in Dana, 1994; Lewis, 2005; Cabral & Fishamn, 2008; and Yang & Ye, 2008), few contributions have tried to identified which factors could explain asymmetries in the international channel, from crude to ex-refinery prices. In particular, Honarvar (2009) argues that US gasoline prices are more influenced by the technological changes on the demand side than crude oil price movements on the supply side. Other explanations for asymmetries in the international channel are related to costs of production adjustment. When costs (crude prices) go down, companies may not have enough capacity to respond to the increase in demand that would come from the immediate passing on of the cut in costs to final (ex-refinery) prices (*v.g.*, comments in Borenstein & Shepard, 1996), thus adjusting prices with a higher celerity upward than downward. Our findings on the international channels for motor diesel and gasoline seem, actually, consistent with this type of explanation.

Galeotti *et al.* (2003) extend the Borenstein *et al.*'s approach to an inter-country comparison between five EU15 countries (France, Germany, Italy, Spain, and the UK), on retail sales of gasoline. They disentangle between the international Brent to Platts (reference ex-refinery) prices channel and the domestic Platts to average retail prices channel, and further allow for asymmetries in the co-integration relation. In analogy with the previous literature, they focus on gasoline, mostly, because of the high share this fuel represents in (European) crude oil consumption.

In this paper, I extend the Galeotti *et al.*'s analysis to all the EU15 Member States, plus the EU15 average, and further allow for the comparative analysis between gasoline and motor diesel. Whilst the US motor fuel consumption is almost exclusively of gasoline, European motor fuel consumption is centred on motor diesel, which represents, contrary to what is suggested by Galeotti *et al.*, about twice the total gasoline consumption across all EU15 Member States. Moreover, in addition to the existing literature, a comparative analysis between gasoline and motor diesel is further motivated by the different impact these products have on both the EU fuel consumption and trade, with the EU being a net importer of diesel and a net exported of gasoline. Our findings on diesel, notably, the existence of asymmetries and overshooting in the international channel (from Brent to Platts prices), non-existent in the case of gasoline, corroborate the importance of considering both motor diesel and gasoline in the analysis.

I use weekly data – the highest frequency available for retail price information in the EU15 – over the period 2004-2008 on (see also Section 2 below): *(i)* crude prices (WTI and 1-month Brent futures); *(ii)* European Platts prices (in CIF and FOB) for diesel and (unleaded premium) gasoline; *(iii)* the 1-month NYMEX futures price for gasoline; and *(iv)* the average pump prices before tax (APPBT) for diesel and IO95 gasoline, as collected by the European Commission (EC), for each one of the EU15 Member States, including the EU15 average (all expressed in € cts/lt, cents per litter).

The reason to consider the EU15 rather than the entire EU (EU27) is justified by the availability of retail price information, as well as by the stronger heterogeneity of retail price regimes in the EU27 than in the EU15. Nevertheless, it must be noted that Irish retail prices were up to the end of the year 2008 still under to a regime of administrative control, unlike the remaining EU15 Member States.

The remaining of the paper is structured as follows. I start by describing the proposed econometric approach for the analysis of the asymmetry phenomenon together with the considered data and the required endogeneity tests on the relations between international reference prices, for crude and Platts (Section 2). I then present the empirical findings on each one of the considered channels of European retail price formation, namely the international channel "Brent → Platts CIF" and the domestic channels "Platts CIF → APPBT", for diesel and IO95 gasoline, as well as on the integrated domestic channels "Brent → APPBT" (Section 3). I conclude with some final remarks on our findings and on the scope for further research (Section 4).

2. Modelling the asymmetry phenomenon in the EU15

As afore referred, I model the asymmetry phenomenon on the adjustment of average pump prices before tax (APPBT) for (motor) diesel and IO95 gasoline in the EU15 by disentangling, in analogy with previous analysis, between the two major channels of pump price formation in the EU, namely, in simplified terms, the international channel "Brent $\rightarrow$ Platts CIF" and the domestic channels "Platts CIF $\rightarrow$ APPBT". I do this by using weekly data covering the period 2004-2008.[1]

APPBT are available in weekly frequency for both diesel and IO95 gasoline across all the EU15 Member States, including the EU15 average. European Platts prices (in CIF and FOB) are available for diesel and (unleaded premium) gasoline and are disentangled between two European reference zones, the North West Europe (NWE) and the Mediterranean (MED).[2] Most EU15 Member State have a single reference Platts price per fuel, either NWE or MED, with the exceptions of Spain and France, which have refining plants located in both zones, as well as of the EU15 average.

Since we consider a single APPBT per fuel, I define, accordingly, a single reference Platts price for Spain, France, and the EU15 average as a weighted average of the relative importance Platts NWE and MED prices have in those cases.[3] The repartition of the EU15 Member States across these Platts zones is the following:

(i) 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 distinct weights of 69.4% and 62.9% for gasoline and diesel respectively; and

(ii) MED: Italy, Greece, Austria[4], 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.

1 In spite of EU15 APPBT data availability previous to 2004, our sample starts in 2004 because Portuguese pump prices for the herein considered fuels (standard diesel and IO95 gasoline) were only liberalized in 2004 January 1, being before (up to that date) subjected to a regime of administrative setting of maximal pump prices (see Portuguese Ordinance No. 1423-F/2003, of 31 December). See Appendix 1 for details on the data considered in this analysis together with the respective sources.

2 The CIF and FOB components of Platts prices are related with the reference area of each one of the Platts reference zones, namely the Amsterdam / Rotterdam / Antwerp (ARA) area in the NWE zone and the seaports area of Lavera (France) and Genova (Italy) in the MED zone. CIF prices do not reflect the cost of entry in each Member State, but the cost of entry into each one of these two areas from the major maritime routes of fuel shipment to those areas, with the FOB component of these prices being thus related with those maritime routes (see Appendix 1 for details).

3 See Appendix 1 for details on the way the (weighted) reference Platts prices for Spain, France, and the EU15 average are computed.

4 According to information from the Austrian Competition Authority (*Bundeswettbewerbsbehörde*), Austrian refineries are linked through pipeline to Italy, thus their location in the Platts MED zone.

After presenting the econometric model (subsection 2.1), I comment (and test for) the possible endogeneity in the relations between international reference prices, mostly, for Brent and European Platts, as found by Borenstein *et al.*'s empirical analysis (subsection 2.2).

2.1. Proposed econometric model

Let b_t denote the week *t*'s price for Brent and c_{it} and p_{it} be, per fuel (diesel and IO95 gasoline), the reference Platts CIF price and the APPBT for Member State *i*, plus the EU15 average (all in cts/lt). In analogy with Borenstein *et al.* (1997), the models of the asymmetry phenomenon over the channels "Brent → Platts" and "Platts → APPBT" are described by the following equations (1) and (2) respectively:[5]

$$\begin{aligned}\Delta c_{i\,t} &= \delta_0 + \sum_{j=1}^{5}\left(\delta_j^{\,+}\Delta c_{i\,t-j}^{\;\;+} + \delta_j^{\,-}\Delta c_{i\,t-j}^{\;\;-}\right) + \sum_{j=0}^{5}\left(\gamma_j^{\,+}\Delta b_{t-j}^{\;\;+} + \gamma_j^{\,-}\Delta b_{t-j}^{\;\;-}\right) + \\ &+ \psi(c_{i\,t-1} - \rho_0 - \rho_1 b_{t-1}) + \zeta_t,\end{aligned} \qquad (1)$$

$$\begin{aligned}\Delta p_{it} &= \alpha_0 + \sum_{j=1}^{5}\left(\alpha_j^{\,+}\Delta p_{it-j}^{\;\;+} + \alpha_j^{\,-}\Delta p_{it-j}^{\;\;-}\right) + \sum_{j=0}^{5}\left(\beta_j^{\,+}\Delta c_{i\,t-j}^{\;\;+} + \beta_j^{\,-}\Delta c_{i\,t-j}^{\;\;-}\right) + \\ &+ \lambda(p_{it-1} - \phi_0 - \phi_1 c_{i\,t-1}) + \xi_{it},\end{aligned} \qquad (2)$$

where the subscripts "+" and "-" denote, respectively, positive and negative variations of the corresponding variables, being defined for any time series x_t as follows:

$$\begin{aligned}\Delta x_t^{\;+} &= \Delta x_t I(\Delta x_t > 0), \\ \Delta x_t^{\;-} &= \Delta x_t I(\Delta xt \leq 0),\end{aligned} \qquad (3)$$

with *I(.)* being a dummy variable taking the value 1 if the inner expression is true and 0 otherwise.

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_{it} and Δp_{it} respectively, the terms associated with the ψ and λ coefficients represent the respective co-integration relations, with these coefficients representing the speed of adjustment to

5 Model (1) is also considered for the additional analysis of the international channel "NYMEX → Platts FOB (NWE and MED) for gasoline" (see below). The selection of coefficients up to 5 lags is justified on the basis of AIC and SBC criteria on the lag selection over all regressions considered.

these common long run paths between the corresponding variables, the terms on the γ and β coefficients represent the (short to medium run) adjustment asymmetries of Platts CIF prices (c_{it}) to shocks on Brent (b_t) and of APPBT (p_{it}) to shocks on Platts prices (c_{it}) respectively. 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.

Similarly with the Borenstein *et al.*'s findings of endogeneity in the relation between US ex-terminal prices and the price for crude, since Brent and Platts CIF (NWE and MED) serve as reference for European crude and ex-refinery prices respectively, such endogeneity may also characterize these reference European prices. In case it does formulation (1) above needs to be reformulated in order to account for such a relation. I examine below this possibility (subsection 2.2).

2.2. Endogeneity in relation between international reference prices

The above referred possible endogenous relation between European Platts and Brent prices may actually have a geographic dimension beyond the EU. Previous analysis suggests, in fact, that the Platts FOB NWE price for gasoline and the 1-month NYMEX futures price for the same product move together (see also Chart 1 below).[6]

According to that analysis, the parallel evolution between these two series could, actually, explain the seasonal peaks in the European Platts price for gasoline, as well as on the respective APPBT, which also characterize the 1-month futures price for that product in the NYMEX, but are not present on both the prices for Brent and the European Platts and APPBT for diesel (see also Chart 2 and Chart 3 below).

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 the EU when compared with diesel,[7] this parallel evolution between European Platts and the NYMEX prices for gasoline may as well stem from the Platts international dimension, *i.e.* from the worldwide importance of Platts prices (for several commodities).

6 *Cf.* June 2008 AdC Report on the Fuel Market in Portugal, Section 4.2, paragraphs 75 and 76, and Chart 43 (in http://www.concorrencia.pt/download/AdC_Report_Fuel_Market_02-06-2008.pdf). See also Appendix 2, subsection A2.2.

7 In particular, on average over the 2002-2007 period, diesel accounts for 69.8% of the total EU15 consumption of this fuel together with IO95 gasoline (see also Table 7 in Appendix 1). 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.

Chart 1 - Weekly averages of Platts FOB, NWE and MED, and of the 1-month NYMEX futures prices for (unleaded premium) Gasoline (€ cts/lt)

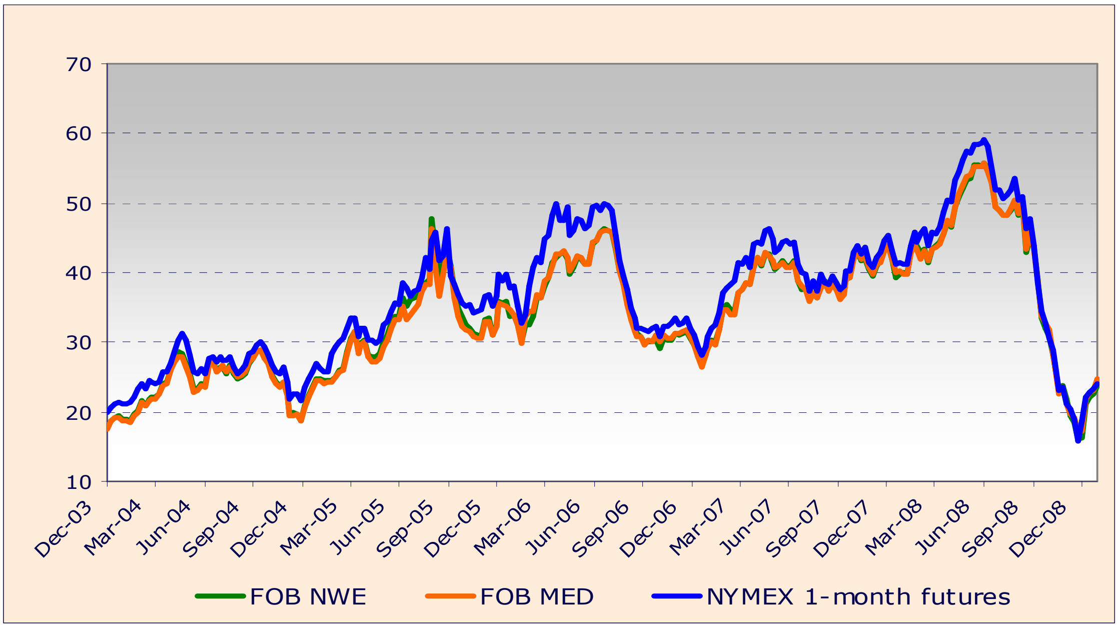


Chart 2 - Weekly averages of APPBT for Diesel in Portugal, Spain, and the EU15 average in comparison with the respective Platts CIF NWE price and the price for 1-month Brent futures (€ cts/lt)

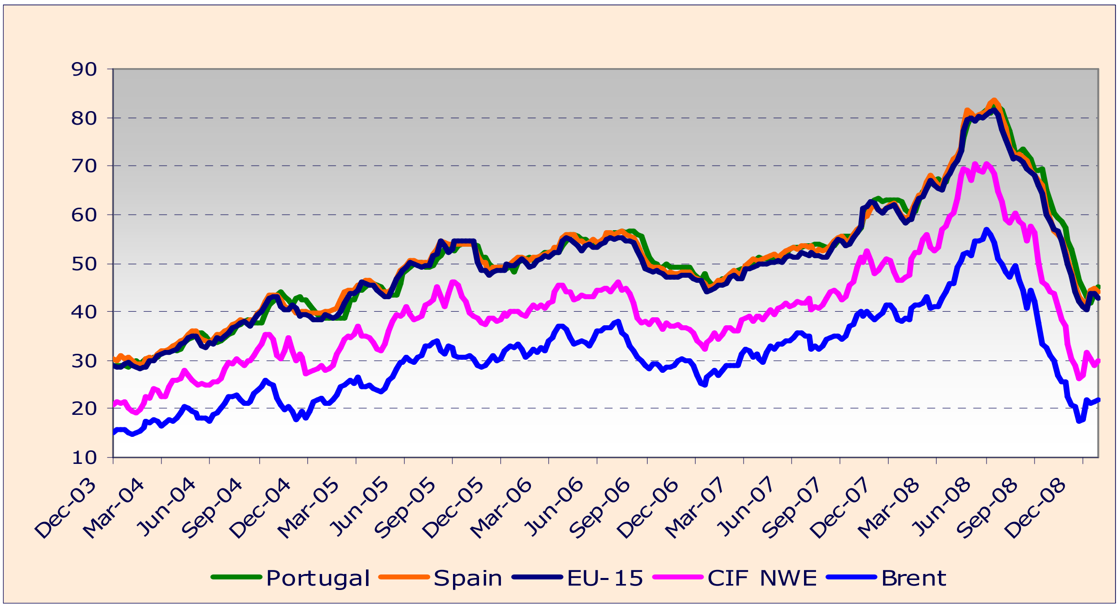
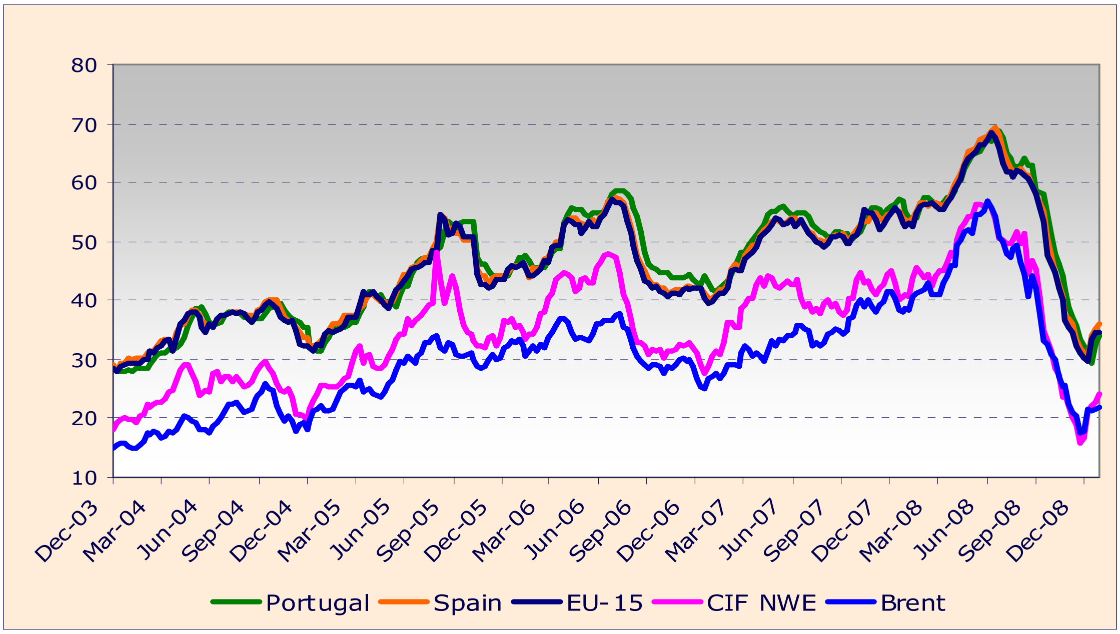


Chart 3 - Weekly averages of APPBT for IO95 Gasoline in Portugal, Spain, and the EU15 average in comparison with the respective Platts CIF NWE price and the price for 1-month Brent futures (€ cts/lt)



According to Platts[8], 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.[9] Platts prices are used as reference in several worldwide 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.

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 both 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).

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8 *Cf.* http:// www.*Platts*.com/About%20*Platts*/history.html, http://www.*Platts*.com/Oil/Market%20 Prices/, http://www.*Platts*.com/Oil/Newsletters%20&%20Reports/US%20Marketscan/ e http:// www.*Platts*.com/ Contact%20Us/.

9 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).

Notwithstanding, the application of Granger causality tests[10] reveal, at very high probability levels, the inexistence of endogeneity in the herein studied relations.

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.[11]

Given the Platts international dimension together with its importance in the US, 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.[12] 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.

These results remain unaltered when considering the original daily series, expressed both in US$ and in €.

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 Section 3 below).

3. Empirical findings on the asymmetry phenomenon

Similarly to Borenstein *et al.* (1997), I analyze the asymmetry phenomenon on the basis of the cumulative impulse response function (CIRF) estimates related with each channel "Brent → Platts CIF", "Platts CIF → APPBT", and "Brent → APPBT".[13]

10 The Granger causality test results are detailed in Appendix 2, Section A2.2.

11 This causality "NYMEX → Platts" of gasoline, and not on the other way around, is actually consistent with previous (preliminary) arguments in the June 2008 AdC Report (Section 4.2, *cit.*).

12 It is further interesting to note that European Platts prices are published before the NYMEX's, at 16:30 GMT.

13 Appendix 2 (subsection A2.1) describes the way these CIRF are determined as well as the way the respective 95% confidence intervals are estimated in order to assess their statistical significance.

Briefly, letting Δy_t and Δx_t be the dependent (LHS) variable and the explicative or exogenous (RHS) variable in each channel respectively, the CIRF 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 (Δx_t = 1 cts/lt). In case of asymmetries, these CIRF are further disentangled between positive shocks ($\Delta x_t = 1$) and negative shocks ($\Delta x_t = -1$).

Overall, results, as detailed below, reveal, first, that in all channels ("Brent $\rightarrow$ Platts CIF", "Platts CIF $\rightarrow$ APPBT", and "Brent $\rightarrow$ APPBT"), the long run (equilibrium) cumulative impact on the dependent variable (y_t) cannot be considered statistically (at the standard 95% probability level) different from the initial shock on the exogenous variable (x_t), positive ($\Delta x_t = 1$) or ($\Delta x_t = -1$). This means that each CIRF (or the corresponding adjustment process) of each channel, to positive and to negative shocks, reaches the steady state at the unitary (1 cts/lt) level.

Second, the international channel "Brent $\rightarrow$ Platts CIF" (subsection 3.1 below) is characterized by asymmetries, but only in the case of diesel. In the domestic channels "Platts CIF $\rightarrow$ APPBT", asymmetries exist in both fuels but depending on the MS (subsection 3.2). In the integrated channels "Brent $\rightarrow$ APPBT", asymmetries get amplified in the case of diesel and mitigated in the case of gasoline (subsection 3.3).

Letting $\{B_k^+\}$ e $\{B_k^-\}$ be the CIRF to positive and negative shocks respectively, on the analysis of the respective 95% confidence intervals estimates, one must, notably, consider:

(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 CIRF (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 will be 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 will be statistical evidence of asymmetry in the adjustment amplitude 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.

3.1. Asymmetries in the international channels

Regarding gasoline, results reveal no asymmetries in both international channels "Brent → Platts CIF (NWE and MED)" and "NYMEX → Platts FOB".[14]

First, in response to a 1 cts/lt rise or fall of the price for Brent, the Platts CIF MED prices for gasoline reach immediately (at k = 0) the steady state,[15] 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.[16] The asymmetry phenomenon, as predicted in the economic literature, assumes the opposite.[17]

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.

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 (as a 1 cts/lt increase) at the time of the impact (at k = 0) to the Platts CIF (NWE and MED) prices for diesel – in spite of the fact that these prices tend 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 (as identical changes) to those prices.

More than asymmetries in the delay of adjustment, 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

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14 These results are detailed in Appendix 2, subsection A2.3.1.

15 Formally, as illustrated in Appendix 2 (subsection A2.3.1), 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.

16 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.

17 I 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.

respectively, after which the cumulative impact on these Platts prices revert to the initial 1 cts/lt rise in the price for Brent.[18]

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)[19] 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.

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:

(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 more pronounced in the NWE than in the MED areas. This may be due to the larger weight zone NWE has on total fuel consumption in the EU15 when compared with zone MED.[20] This fact coupled with the EU 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, the EU refining capacity constraints on diesel coupled with related costs of production adjustment of this product (including stocks management / reposition issues) may lead EU refiners 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 has a smaller weight than diesel for EU 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 the EU is a net exporter of gasoline, particularly towards the US, the EU natural incentive for gasoline price trade competitiveness may justify the fast and symmetric adjustment

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18 Formally, this means that after 8 and 5 weeks Platts CIF NWE and MED prices for diesel adjust respectively to a cumulative increase equal to the initial rise (of 1 cts/lt) in the price for Brent.

19 These minimal and maximal values correspond to the lower and the upper limits of the 95% confidence interval of the corresponding CIRF ordinate respectively (see Appendix 2 for details).

20 As above referred, the total EU15 consumption of diesel represents, on average over the period 2002-2007, more than twice that of gasoline (in particular, standard diesel accounts for 69.8% of the total EU15 consumption of this fuel together with IO95 gasoline). In the same period, the NWE zone accounts for 69.4% and 62.9% of total EU15 consumption of IO95 gasoline and (standard) diesel respectively. Although, when compared with that of gasoline, the total EU15 consumption of diesel is higher in the MED zone (73.8%) than in the NWE (67,7%), the EU15 total annual consumption of diesel and IO95 gasoline are, in millions of m^3 and on over the same period, 89.2 and 42.5 in zone NWE and 52.6 and 18.7 in zone MED respectively (see Table 7 in Appendix 1).

of European reference ex-refinery (Platts CIF) prices for gasoline to changes on the prices for both Brent and the gasoline's 1-month NYMEX futures.

3.2. Asymmetries in the domestic channels "Platts → APPBT"

In the analysis of this channel as well as of the integrated channel "Brent → APPBT" (subsection 3.3 below), I exclude the case of Ireland since retail prices were in this State, up to the end of 2008, subjected to administrative control in opposition with the situation in the remaining EU15 MS. 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.

Asymmetries characterize some of the domestic channels "Platts CIF → APPBT", namely (see Table 1 below):[21] 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); and Portugal in both fuels, but only in the delay of adjustment (1 week faster in increases than in falls).

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.

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.

[21] The estimation results on these domestic channels are detailed in Appendix 2 (subsection A2.3.2).

Table 1 – 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

<table>
<tr><th></th><th colspan="2">Diesel</th><th colspan="2">IO95 Gasoline</th></tr>
<tr><th></th><th>Rise</th><th>Fall</th><th>Rise</th><th>Fall</th></tr>
<tr><td>Austria</td><td>3</td><td>2</td><td colspan="2">4</td></tr>
<tr><td>Greece</td><td colspan="2">3</td><td>2</td><td>3</td></tr>
<tr><td>Italy</td><td>4</td><td>5</td><td colspan="2">5</td></tr>
<tr><td>Spain</td><td>6</td><td>2</td><td colspan="2">5</td></tr>
<tr><td>France</td><td colspan="2">2</td><td colspan="2">2</td></tr>
<tr><td>Belgium</td><td>2</td><td>3</td><td>2</td><td>5</td></tr>
<tr><td>Denmark</td><td colspan="2">1</td><td colspan="2">1</td></tr>
<tr><td>Finland</td><td>1</td><td>3</td><td>1</td><td>4</td></tr>
<tr><td>Germany</td><td colspan="2">2</td><td>1</td><td>2</td></tr>
<tr><td>Ireland</td><td>7</td><td>6</td><td>6</td><td>7</td></tr>
<tr><td>Luxembourg</td><td colspan="2">1</td><td colspan="2">2</td></tr>
<tr><td>Netherlands</td><td colspan="2">1</td><td>1</td><td>2</td></tr>
<tr><td>Portugal</td><td>4</td><td>5</td><td>5</td><td>6</td></tr>
<tr><td>Sweden</td><td colspan="2">1</td><td colspan="2">1</td></tr>
<tr><td>UK</td><td>5</td><td>4</td><td>6</td><td>5</td></tr>
<tr><td>EU15 Average</td><td>3</td><td>2</td><td colspan="2">3</td></tr>
</table>

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.

On the asymmetries on both the delay and amplitude of adjustment, we note:

(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 1 above).

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 APPBT taking 1 week more to fall than to rise following from an initial fall and rise of the corresponding Platts CIF prices respectively.

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.

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 1 above).

Notwithstanding, in analogy with the Dutch case, results do not allow to unequivocally conclude that when the national APPBT fully adjusts to a rise in the corresponding Platts CIF prices, 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 cumulative adjustment to a rise on those CIF prices.[22]

Excluding the Irish case, 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 national ex-refinery indexation formula to Platts CIF prices in place up to the end of 2007 (period covering more than 80% of the considered time sample), based on the average daily Platts CIF prices observed during the 2 weeks prior to the setting of ex-refinery prices. This indexation delay changed in the beginning of 2008 to a single week (see above). In analogy with previous findings,[23] the adjustment process of national APPBT to average domestic ex-refinery prices show evidence of no asymmetries, with this being completed 2 and 3 weeks after the initial shock (positive or negative) in diesel and gasoline respectively.

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22 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.

23 *Cf.* AdC December 2008 Interim Report on the Liquid Fuel and Bottled Gas Sectors in Portugal, Section 3.3 (n http://www.concorrencia.pt/download/AdC_Relatorio_Combustiveis_Liquidos_Gas_Engarrafado_em_Portugal_en.pdf). See also Illustration 22 in Appendix 2, subsection A2.3.2.

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).

Although the speed of adjustment of APPBT to reference Platts CIF prices may be related with the respective ex-refinery indexation formula to those CIF prices, there is no available information on such indexation formulas used in MS other than Portugal to draw such a conclusion. Moreover, the literature provides other reasons for the existence or not of asymmetries in the domestic channels "Platts CIF → APPBT" and for distinct speed of adjustments in this channel across fuels and MS (see v.g., issues related with consumer preferences – searching costs and learning – in Dana, 1994; Lewis, 2005; Cabral & Fishman, 2008; Tappata, 2008; and Yang & Ye, 2008; as well as differences in competition structures in Deltas, 2007).

In particular, the French APPBT symmetry of adjustment to Platts CIF price changes, completed 2 weeks after the initial shock (positive or negative) in both diesel and gasoline, might be related with the hypermarket pumps' retail market share (around 50%) in this country, which may force oil companies to adjust faster their prices downwards when Platts CIF prices rise as they do upward. However, hypermarket pumps have as well a significant share (also around 50%) in UK retail sales, though UK APPBT take much longer (even if with no asymmetries) to adjust to reference Platts CIF prices than the French.

Similarly, Spanish APPBT take as long as Portuguese APPBT to adjust to Platts CIF price changes, but the Spanish adjustment processes of diesel and gasoline are, as opposed with the Portuguese, characterized by no asymmetries.

Moreover, apart from the evidence on asymmetries for some MS, including Portugal, results further reveal substantial differences across MS on the adjustment processes (CIRF) of the respective APPBT, per fuel, to changes on reference Platts CIF prices.[24]

Results do not, therefore, appear to be consistent with what a specific economic theory predicts, but rather suggest the need for an in-depth analysis of each MS specific retail sector structure, in comparison with that of other MS, which may better explain our empirical findings. I leave this issue for further research.

Notwithstanding, our empirical findings may also, in part, stem from the type of data used in the analysis, aggregated both over space, by considering national retail price

[24] Galeotti *et al.* (2003) reach a similar conclusion on their five European countries analysis.

averages rather than retail prices at a local market level, and over time by considering weekly series rather than daily data.[25]

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 Portugal 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.

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.

In spite of leaving for further research a more disaggregated type of analysis, it must be noted that such an analysis is hardly extended to the entire EU15 whose retail price information is only available as consider in this paper.

Keeping these *caveats* in mind, I present below the empirical findings on the integrated channel "Brent → APPBT" (subsection 3.3).

3.3. Asymmetries in the integrated channels "Brent → APPBT"

As above referred, this channel "Brent → APPBT" results, per fuel (diesel and IO95 gasoline), from the integration of the two previously analyzed channels. Technically, 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.[26]

In practice, 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".

Moreover, since APPBT are directly related with Platts CIF prices, through the relation between these latter and ex-refinery prices, and only indirectly related with the price for Brent, through the relation Platts CIF prices have with this latter, nothing implies

25 See, in particular, Geweke (2004) comments on the existing empirical literature on the asymmetry phenomenon as well as on the empirical effects of the time and spatial aggregation problems.

26 See Appendix 2, subsection A2.1 for details.

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".

In particular, the 4 weeks delay symmetric adjustment of Portuguese APPBT for gasoline to the price for Brent (see Table 2 below) is in nothing related with the 5 and 6 weeks asymmetric adjustment of this APPBT to a rise and a fall of the reference Platts CIF price respectively (see subsection 3.2 above).

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 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".

Whilst 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, both in the delay and amplitude of adjustment, in the cases of Austria, Greece, Italy, Belgium, Finland, and Ireland (see Table 2 below).

Also in the case of gasoline, we observe that whilst the national APPBT (fully) adjusts with a 5 and 6 weeks delays to a rise and a fall of the reference Platts CIF (NWE) price respectively, when compared with the price for Brent, these delays shrink to 4 weeks (and symmetrically to rises and falls). The Spanish APPBT for gasoline shows, instead, the same 5 weeks delay of full adjustment to either a rise or a fall of both the reference Platts CIF and Brent prices. Moreover, 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.

Overall and regarding gasoline, results indicate thus 8 and 6 asymmetry cases in the channels "Platts CIF → APPBT" and "Brent → APPBT" respectively.

In contrast, in the case of diesel, the integrated domestic channels "Brent → APPBT" clearly amplify the cases of asymmetry with respect to the previous channels "Platts CIF → APPBT" (subsection 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 (in the adjustment amplitude and delay) to rises and falls of the price for Brent. In the channels "*Platts* CIF → APPBT for diesel", asymmetries were only present in the cases of Italy, Belgium, Finland, Germany, and Portugal.

Table 2 – 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

<table>
<tr><th></th><th colspan="3">Diesel</th><th colspan="2">IO95 Gasoline</th></tr>
<tr><th></th><th>Rise</th><th>Fall</th><th>Overshooting</th><th>Rise</th><th>Fall</th></tr>
<tr><td>Austria</td><td>2</td><td>3</td><td></td><td>3</td><td>6</td></tr>
<tr><td>Greece</td><td>2</td><td>4</td><td></td><td>2</td><td>3</td></tr>
<tr><td>Italy</td><td>2</td><td>5</td><td></td><td>4</td><td>6</td></tr>
<tr><td>Spain</td><td colspan="2">3</td><td></td><td colspan="2">5</td></tr>
<tr><td>France</td><td>2</td><td>3</td><td>4 - 5</td><td colspan="2">2</td></tr>
<tr><td>Belgium</td><td>2</td><td>4</td><td>2 - 8</td><td>2</td><td>3</td></tr>
<tr><td>Denmark</td><td>1</td><td>4</td><td>3 - 8</td><td colspan="2">1</td></tr>
<tr><td>Finland</td><td>1</td><td>4</td><td></td><td>1</td><td>2</td></tr>
<tr><td>Germany</td><td>1</td><td>2</td><td>4</td><td>3</td><td>2</td></tr>
<tr><td>Ireland</td><td>6</td><td>8</td><td></td><td>7</td><td>8</td></tr>
<tr><td>Luxembourg</td><td>1</td><td>2</td><td>4 - 6</td><td colspan="2">2</td></tr>
<tr><td>Netherlands</td><td colspan="2">1</td><td></td><td colspan="2">1</td></tr>
<tr><td>Portugal</td><td>3</td><td>6</td><td>5 - 11</td><td colspan="2">4</td></tr>
<tr><td>Sweden</td><td>1</td><td>3</td><td>5</td><td colspan="2">1</td></tr>
<tr><td>UK</td><td colspan="2">4</td><td></td><td>6</td><td>4</td></tr>
<tr><td>EU15 Average</td><td>2</td><td>3</td><td>3 - 9</td><td>3</td><td>2</td></tr>
</table>

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.

Regarding diesel, we further observe that in all cases considered, including those with no asymmetries, APPBT tend to adjust faster to a rise in the price for Brent than to a rise in the reference Platts CIF price and slower 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.

Moreover, there is further evidence of overshooting in the channels "Brent → APPBT for diesel" (in 7 MS and the EU15 average). 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 2 above).

As results above indicate, this overshooting phenomenon is likely to stem from the international channel "Brent → Platts CIF" (subsection 3.1) – as it does not show up in the domestic relations "Platts CIF → APPBT" (subsection 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.

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 to stem from the higher pressure 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 3.1) related with the larger weight of diesel in EU15 total fuel consumption, about twice that of gasoline, and of the EU refining capacity deficit in diesel, with EU being a net exporter of gasoline, particularly towards the US.

4. Concluding comments

In spite of a large strand of the literature on the price adjustment asymmetry phenomenon – developed after the contribution of Bacon (1991), the first author to find evidence in favour of this phenomenon in the UK retail sales of gasoline – the empirical contributions are not consensual on the existence of this phenomenon, in particular, on the way retail prices for gasoline adjust to changes both in ex-refinery and crude oil prices.

In this paper I follow the Borenstein *et al.* (1997) co-integration-based methodology to model the asymmetry phenomenon in retail sales of gasoline and motor diesel across all the EU15 Member States, plus the EU15 average, and disentangle, accordingly, between the two major channels of pump price formation in Europe, namely from Brent to Platts CIF (reference ex-refinery) prices and from these latter to average pump prices before tax (APPBT).

In addition to the existing literature, I allow for an inter-country comparison of the asymmetry phenomenon, broader than in the Galeotti *et al.* (2003)'s five European countries (France, Germany, Italy, Spain, and UK) analysis, as well as for a comparative analysis between gasoline (the only fuel considered in the literature) and motor diesel. Considering both these types of fuel is further motivated by the distinct roles these fuels play in both EU motor liquid fuel consumption (about 2/3 in diesel) and trade (with the EU being a net importer of diesel and a net exported of gasoline). I further disentangle between the two European Platts reference zones, the NWE (for the North Western Europe) and the MED (for the Mediterranean Europe).

Results reveal, first and unlike previous findings for the US, including the Borenstein *et al.*'s (1997), the absence of endogeneity in the international relations:

(i) Between Platts CIF (NWE and MED) and Brent prices, with the causality being, as desired, in the direction "Brent → Platts CIF"; and

(ii) 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".

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 not unanimously over all cases (Member States and types of fuel) considered. They reveal 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", namely in Greece, Belgium, Finland, and Germany, and with a lower intensity in the cases of the Netherlands and Portugal.

Moreover, in the case of diesel (but not of 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 NWE and MED respectively, after which they revert to the same cumulative increase as the initial rise in the price for Brent.

The integration of the channels "Brent → Platts CIF" and "Platts CIF → APPBT" into the channel "Brent → APPBT" amplifies the asymmetry phenomenon (and overshooting) in the case of diesel and slightly attenuates it in the case of gasoline.

In particular, whilst there is a 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 (to a cumulative identical change) after 4 weeks to a rise or a fall in the price for Brent.

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. These integrated channels are also characterized by an overshooting phenomenon for 7 EU15 Member States, and 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).

Also regarding this channel, results reveal that in all cases considered the APPBT for diesel adjust faster to rises in the price for Brent than in reference Platts CIF prices and slower to falls in the price for Brent than in the corresponding Platts CIF price.

These results on diesel, both of the respective APPBT faster adjustment to the price for Brent than to Platts CIF (reference ex-refinery) prices and of the overshooting phenomenon, seemingly non-existent in the case of gasoline, are likely to stem from the higher pressure the price of raw material (Brent) puts on both the Platts CIF prices and the APPBT for diesel than for gasoline as a result, notably, of the larger weight diesel represents in total EU motor fuel (for road use) consumption, about twice that of gasoline, and of the EU refining capacity deficit in diesel. In the case of gasoline, the importance this product has for EU trade, particularly towards the US, is likely to justify the fast and symmetric adjustment of European Platts CIF prices for gasoline to changes on the prices for both Brent and the 1-month NYMEX futures for this product.

These findings may be consistent with existing explanations of the asymmetry phenomenon based on costs of production adjustment. As the EU refining capacity constraints on diesel are likely to explain the asymmetries in the international channel "Brent $\rightarrow$ Platts CIF" for this product, so is the EU trade surplus of gasoline likely to induce – for reasons of trade competitiveness – a fast and symmetric adjustment of EU reference (Platts CIF) prices for this fuel to both the price for Brent and US reference ex-refinery prices for gasoline (such as the 1-month NYMEX futures).

Because the adjustment processes of domestic APPBT to reference Platts CIF prices differ across EU15 Member States, results do not seem to support an unique economic explanation on the existence of the asymmetry phenomenon, but rather suggest the need for an in-depth comparative analysis between the EU15 Member States' specific retail and ex-refinery sectors structure in order to better explain our empirical findings. In other words, our empirical findings suggest that existing economic explanations of the asymmetry phenomenon might need to take into account the specific retail and ex-refinery structures of each EU15 Member State in order to better justify the evidence in favour or against the asymmetry phenomenon.

Moreover, this paper's empirical analysis opens other issues which are also left for further research. In particular, the proposed econometric modelling may require some rethinking both of the way the regime switching between rises and falls is modelled, with this being deterministic rather than stochastic as the considered co-integration modelling would presume (see *v.g.*, the recent Honarvar, 2009 approach), and on the modelling of higher frequency data, such as daily data, while co-integration based methodologies are usually better suited for the analysis of lower frequency data.

Bibliography

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.

Borenstein, S., Cameron, C. A., & R. Gilbert (1997). "Do Gasoline Prices Respond Asymmetrically to Crude Oil Price Changes?", *Quarterly Journal of Economics*, **112(1)**: 305-339.

Borenstein, S. & A. Shepard (1996). "Dynamic Pricing in Retail Gasoline Markets", *RAND Journal of Economics*, **27(3)**: 429-451.

Cabral, L. & A. Fishman (2008). "Business as Usual: A Consumer Search Theory of Sticky Prices and Asymmetric Price Adjustment", *Working Paper*, August 2008.

Dana, J: D. (1994). "Learning in an Equilibrium Search Model", *International Economic Review*, **35(3)**: 745-771.

Deltas, G. (2007). "Asymmetries in Retail Gasoline Price Dynamics and Local Market Power", *Working Paper*, University of Illinois, April 2007.

Eckert, A. (2002). "Retail Price Cycles and Response Asymmetry", *Canadian Journal of Economics*, **35(1)**: 52-77.

Galeotti, M., Lanza, A., & M. Manera (2003), "Rockets & feathers revisited: an international comparison on European gasoline markets", *Energy Economics*, **25**: 175-190.

Geweke, J. (2004). *Issues in the "Rockets and Feathers" Gasoline Price Literature*, Report to Federal Trade Commission, University of Iowa, 16 March 2004.

Hamilton, J. D. (1994). *Time Series Analysis*, Princeton University Press, New Jersey.

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.

Lewis, M. (2005). "Asymmetric Price Adjustment and Consumer Search: An Examination of the Retail Gasoline Market", *Working Paper*, Ohio State University, US.

Peltzman, S. (2000). "Prices rise faster than they fall", *Journal of Political Economy*, **108**: 466-502.

Wlazlowski, S. (2003). "Petrol and Crude Oil Prices: Asymmetric Price Transmission", *Ekonomica – Cyprus Journal of Economics*, **11:** 1-25.

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.

Appendix 1: Considered data and respective sources

In this appendix, I describe the data used in the analysis (subsection A1.1) followed by the repartition of reference Platts CIF prices across the EU15, including a brief description of the refining activities in the Iberian Peninsula and in France, required for the determination of the respective Platts prices (subsection A1.2).

A1.1. Data and respective sources

As referred in the text (Section2), I consider weekly data[27] over the period 2004-2008 on the following series:

(i) The weekly average exchange rate US$/€, as published by the ECB;

(ii) 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 ECB weekly average exchange rate US$/€,;

(iii) The weekly average, from Monday to Friday, of the Platts (NWE and MED)[28], 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 the ECB weekly average exchange rate US$/€;

(iv) 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 the ECB weekly average exchange rate US$/€;[29] and

[27] Although daily data, available for crude (Brent and WTI) and for Platts and NYMEX prices, might provide a more rigorous analysis of the herein considered issues, there is no information in such a frequency for EU APPBT. Moreover, an analysis in daily frequency is likely to require additional controls for volatility dynamics – which have been not found in our weekly data analysis – as well as a possible reformulation of the co-integration type of models considered; what I leave for further research.

[28] In this analysis, I consider the following Platts specifications (available up to the end of the year 2008), disentangled between zones 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". The unavailable Platts MED prices for the first semester of 2004 have been extrapolated from the ratio between the respective average Platts NWE and MED prices observed during the first semester of 2005.

[29] 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 equality, 1 bbl = 42 US gallons). Missing daily observations have been replaced by simple extrapolation between the immediately before and after observed values.

(v) The weekly APPBT for diesel and IO95 gasoline, in € cts/lt, for each one of the EU15 Member States, including the EU15 average, as published by the EC DG TREN.[30]

As referred in the text (subsection 2.2), apart from the differential between the 1-month NYMEX futures and the Platts FOB (NWE and MED) prices for gasoline being quite low, below 2.5 cts/lt on average over the considered period (2004-2008), there is also almost no difference between Platts NWE and MED prices, and in CIF and FOB, per fuel. The differential between these prices for diesel and gasoline are, respectively and on average over that period, -0.40 and 0.14 cts/lt in FOB terms and -0.31 and 0.45 cts/lt in CIF terms. On average over the same period, the differentials between Platts CIF an Platts FOB prices get to the highest values of 1.03 and 0.94 cts/lt in the NWE and MED zones respectively (see Chart 1 in the text and Table 3 below).

Table 3 – 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**

A1.2. Reference Platts CIF prices across the EU15

As referred in the text (Section 2), the reference Platts prices for most EU15 Member States are either NWE or MED, with the exceptions of Spain, France, and the EU15 average which have refining plants located in both those two zones.

Given the available information, I define the Spanish and the French reference Platts prices from the refining capacity these two countries have in these two European Platts zones, with zones NWE and MED accounting thus for weights of 33.8% and 66.2% in Spain and 66.5% and 33.5% in France respectively (see Table 4 and Table 5 as well as Illustration 1 and Illustration 2 below).

[30] The average pump prices before tax (APPBT) are related to motor diesel and IO95 gasoline ("euro super 95"), 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 effective pump prices – collected once a week – with the price charged in each pump being weighted by its total annual volume of sales per fuel.

Table 4 – Refining capacity in the Iberian Peninsula (year 2008), discriminated by oil company, refining plant, and by Platts zone (NWE and MED)

				Iberian %	
Oil company	**Refining Plant**	**kbbl / day**	**Platts zone**	**Firm**	**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.

Table 5 – Refining capacity in France, discriminated by oil company, by refining plant, and by Platts zone (NWE and MED)

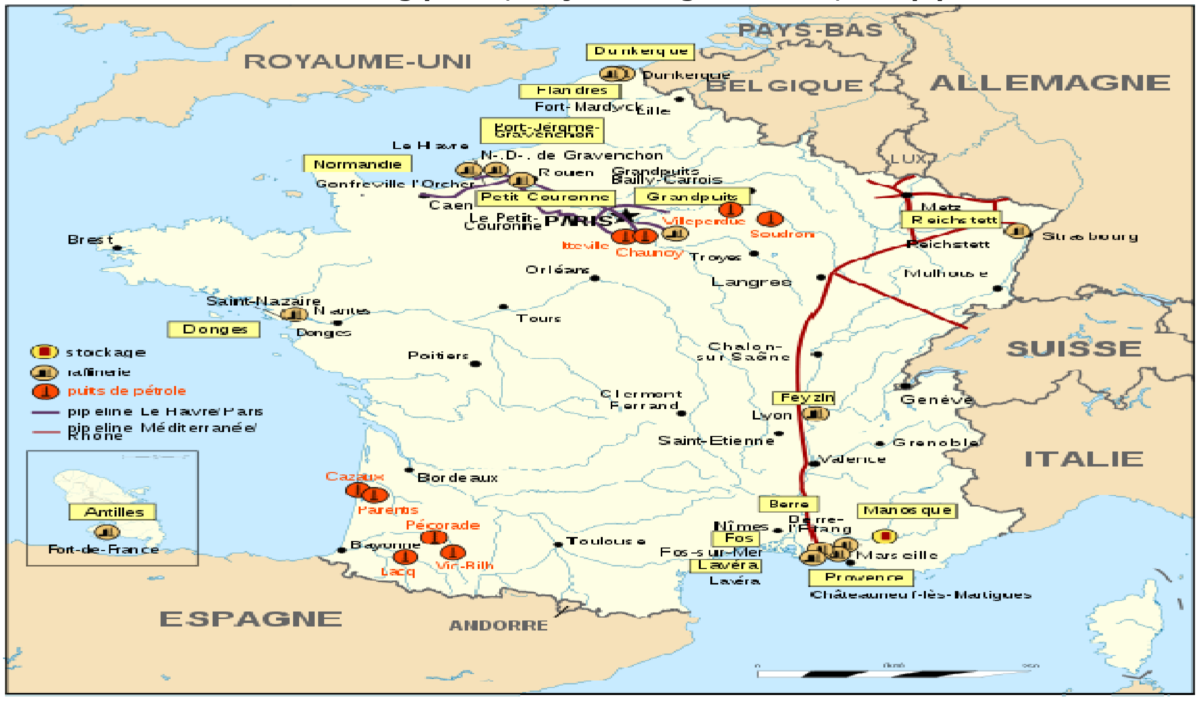
				% in France	
Oil company	**Refining Plant**	**kbbl / day**	**Platts zone**	**Firm**	**Refinery**
TOTAL	Donges	231	NWE	**60.7%**	9.8%
	Normandie	325	NWE		13.8%
	Flandres	160	NWE		6.8%
	Dunkerque	343	NWE		14.5%
	Grandpuits	99	NWE		4.2%
	Provence	155	MED		6.6%
	Feyzin	119	MED		5.0%
EXXON MOBIL	Port Jérôme	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).

Illustration 1 – Refineries and CLH storage facilities and pipelines in Spain

Source: CLH (*cf.* http://www.clh.es/GrupoCLHCastellano/Clientes/CondicionesAcceso/Instalaciones.htm).

Illustration 2 – 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).

It is interesting to note that the total daily refining capacity (in 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 6 below), represents, respectively, 29, 32, and 39 oil bbl per day and per thousand inhabitants in each one of these three States.

Table 6 – 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).

In turn, I compute the EU15 average reference Platts prices as the average of reference Platts prices, per fuel (diesel and gasoline), across the 15 Member States, each one weighted by its total annual consumption (in m^3) of each fuel, on average over the period 2002-2007. These reference EU15 Platts prices correspond then, as referred in the text, to the weighted average of the Platts NWE and Platts MED prices with weights of 69.4% and 30.6% in the case of gasoline and of 62.9% and 37.1% in the case of diesel respectively (see Table 7 below).

Table 7 – Total annual consumption of diesel and IO95 gasoline across the EU15, x1000 m^3 and in m^3 *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).

Appendix 2: Complement to the econometric analysis of the asymmetry phenomenon

To better understand the empirical finings on the asymmetry phenomenon, this appendix details the way the cumulative impulse response functions (CIRF) are derived, as related with the channels "Brent → Platts CIF", "Platts CIF → APPBT", and with the integrated channels "Brent → APPBT" (subsection A2.1). It also details the Granger causality test results on the endogeneity in the relations between reference international prices for crude and refined products (subsection A2.2). The appendix is concluded with the presentation of the CIRF estimates and their 95% confidence intervals (subsection A2.3).

A2.1 CIRF over the international and domestic channels

Formally, since models (1) and (2) in the text (subsection 2.1) are stationary, they admit a so-called Wold or MA(∞) representation.[31] Letting y_t and x_t be, for each one of these models, the corresponding dependent (LHS) and explicative (RHS) variables respectively, we have that the symmetric version of these models can be written as:

$$\Delta y_t = \alpha_0 + \sum_{j=1}^{K} \alpha_j \Delta y_{t-j} + \sum_{j=0}^{M} \beta_j \Delta x_{t-j} + \lambda (y_{t-1} - \phi_0 - \phi_1 x_{t-1}) + \xi_t, \qquad \text{(A2.1)}$$

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.

The MA(∞) representation of model (A2.1) can be written as:

$$\Delta y_t = \mu + \sum_{j=0}^{\infty} \varphi_j \Delta x_{t-j} + \varepsilon_t, \qquad \text{(A2.2)}$$

where μ is a finite constant term, ε_t is a MA(∞) filter of the white noise ξ_t in (A2.1) above, and the φ_j coefficients are expressed in terms of the expression (A2.1) coefficients α_j (for $j > 0$), β_j, and ϕ_1.

[31] 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).

The CIRF of y_t to x_t is then given by the infinite sequence $\{\Phi_k;$ for all $k \geq 0\}$ of the cumulative $\{\varphi_j\}$, with k^{th} ordinate:

$$\Phi_k = \sum_{j=0}^{k} \varphi_j \qquad \text{(A2.4)}$$

which can be shown to be described by the following set of equations:[32]

$$\begin{aligned}
&\Phi_0 = \beta_0, \\
&\Phi_1 = \Phi_0 + \beta_1 + \lambda(\Phi_0 - \phi_1) + \alpha_1 \Phi_0, \\
&\Phi_2 = \Phi_1 + \beta_2 + \lambda(\Phi_1 - \phi_1) + \alpha_1(\Phi_1 - \Phi_0) + \alpha_2 \Phi_0, \\
&\ldots \\
&\Phi_k = \Phi_{k-1} + \beta_k + \lambda(\Phi_{k-1} - \phi_1) + \sum_{j=1}^{k-1} \alpha_j (\Phi_{k-j} - \Phi_{k-j-1}) + \alpha_k \Phi_0,
\end{aligned} \qquad \text{(A2.5)}$$

where the α_k and β_k coefficients are, given models (1) and (2) in the text (subsection 2.1), set to zero for any $k > 5$.

In turn, the CIRF for the integrated domestic channels "Brent → APPBT" are obtained in the following way. Let $\{\varphi_j\}$ and $\{\psi_j\}$ denote the MA(∞) coefficient representations related with the symmetric versions of channels "Brent → Platts CIF" and "Platts CIF → APPBT" respectively. It is then straightforward to show that the j^{th} ordinate of the CIRF related with the the integrated channel "Brent → APPBT" is given by:

$$\theta_j = \partial \Delta p_{it+j} \big/ \partial \Delta b_t = \sum_{m=0}^{j} \varphi_m \psi_{j-m}. \qquad \text{(A2.6)}$$

whose cumulative over j = 0, 1, 2, …, k , *i.e.* over the first k weeks after the shock (for any integer $k \geq 0$), namely

$$\Omega_k = \sum_{j=0}^{k} \theta_j \ , \qquad \text{(A2.7)}$$

defines the k^{th} ordinate of the corresponding CIRF, as considered in the analysis.

The CIRF 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 "+"

32 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).

and "-" respectively.[33] 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.[34]

A2.2 Endogeneity in the relation between international prices for crude (Brent) and for refined products (Platts)

As referred in the text (subsection 2.2), I 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 bivariate Granger causality tests.

These Granger causality test results are summarized in Table 8 below by the means of 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.

The cases considered in our analysis (subsection 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 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".

Results reveal that (see Table 8 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;

[33] 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.

[34] 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). I further note that the application of the Bootstrapping methodology for the estimation of these confidence intervals would not only be more cumbersome and also not necessarily of better quality given the validity of the Normal approximation in the present analysis.

(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 AdC Report, Section 4.2, *cit.*) 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 "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;

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.

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$/€ → Platts CIF NWE for diesel" and of WTI price where there is evidence of causality in the direction "WTI → US$/€".

Table 8 – 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 weekly averages (in € cts/lt) series considered in the analysis

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

A2.3 CIRF and 95% confidence interval estimates on the analysis of the asymmetry phenomenon in the EU15

As referred in the text (Section 3), I present the estimation results on the CIRF and the corresponding 95% confidence intervals – CI (95%) – disentangled between the channels considered in the analysis, namely "Brent → Platts CIF" and "NYMEX → Platts FOB (NWE and MED) for gasoline" (subsection A2.3.1), "Platts CIF → APPBT" (subsection A2.3.2), and "Brent → APPBT" (Section A2.3.3).

I disentangle between CIRF to positive shocks ("Rise") and to negative shocks ("Fall"), each associated with the CI (95%) lower (Inf.) and the upper (Sup.) limits. 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 CIRF), 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.

Analogously, in the Illustrations' charts, the vertical coloured lines, orange and green in the first chartand pink and blue in the second chart, 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. In the cases consistent with the overshooting phenomenon, the (dark) bold vertical lines indicate the period of time over which this phenomenon lasts.

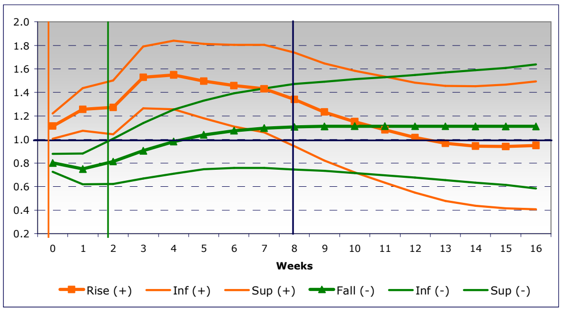
The zero and unit values in the ordinate axis – with the value of 1 being associated with the steady state – are also indicated in the charts with corresponding horizontal (straight) lines.

A2.3.1. CIRF estimates on the international channels

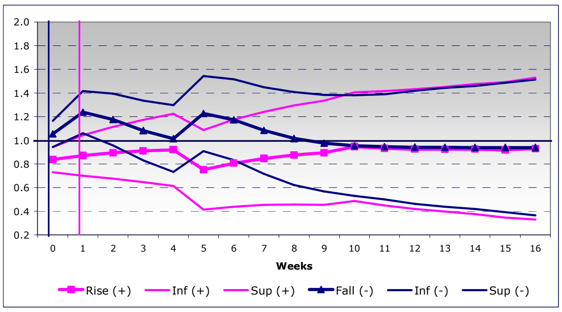
Illustrations below summarize the CIRF estimates and the corresponding CI (95%) related with the international channels "Brent → Platts CIF (NWE and MED) for both fuels" and "NYMEX → Platts FOB for gasoline".

Illustration 3 – International channel "Brent → Platts CIF NWE": CIRF (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 for Diesel"



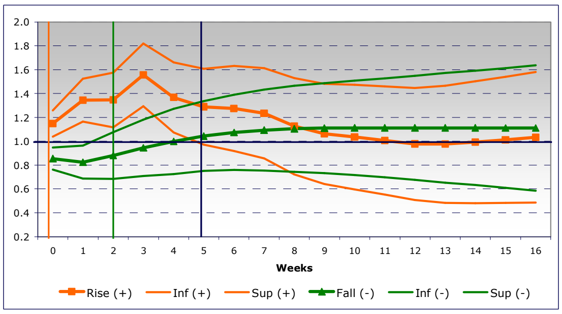
"Brent -> Platts CIF NWE for (unleaded premium) Gasoline"



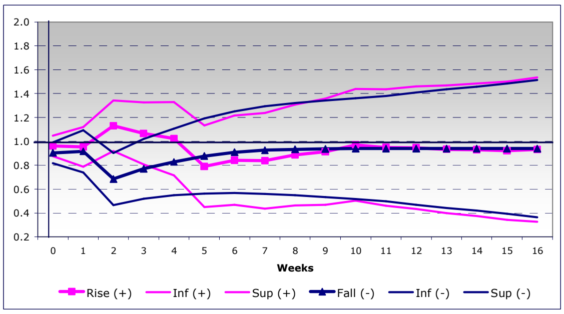
	Brent -> Platts CIF NWE											
	Diesel						Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	1.114	**1.006**	**1.221**	0.802	0.725	0.878	0.836	0.728	0.943	1.053	0.942	**1.165**
1	1.255	**1.074**	**1.437**	0.750	0.619	0.881	0.870	0.698	**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 4 – International channel "Brent → Platts CIF MED": CIRF (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 for Diesel"



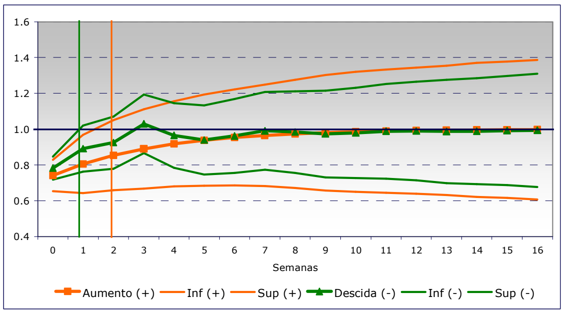
"Brent -> Platts CIF MED for (unleaded premium) Gasoline"



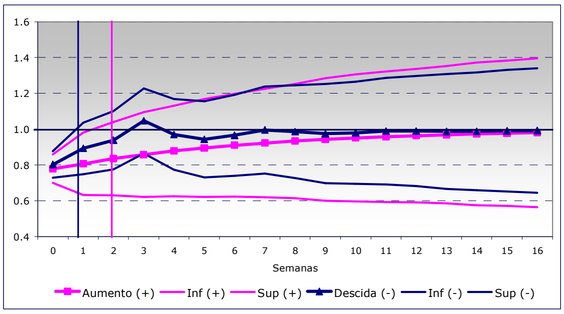
	Brent -> Platts CIF MED											
	Diesel						Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	1.148	**1.038**	**1.258**	0.854	0.761	0.947	0.962	0.876	**1.047**	0.904	0.816	0.991
1	1.344	**1.164**	**1.524**	0.825	0.687	0.962	0.954	0.787	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 5 – International channel "NYMEX → Platts FOB (NWE and MED) for gasoline": CIRF (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 NWE for (unleaded premium) Gasoline"



"NYMEX -> Platts FOB MED for (unleaded premium) Gasoline"



	NYMEX -> Platts FOB (unleaded premium) Gasoline											
	Zone NWE						Zone MED					
	Rise			Fall			Rise			Fall		
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	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

A2.3.2. Domestic channels "Platts CIF → APPBT"

I present below the CIRF 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.

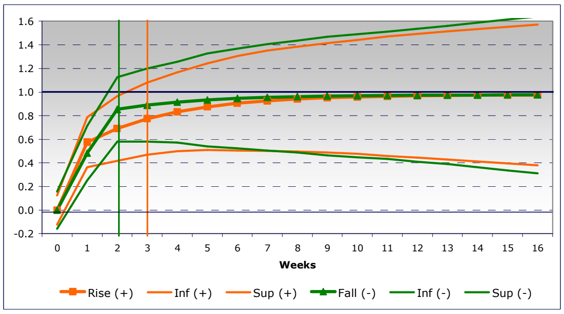
As referred in the text (Section 2), EU15 Member States are divided between the two European Platts zones as follows:

(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

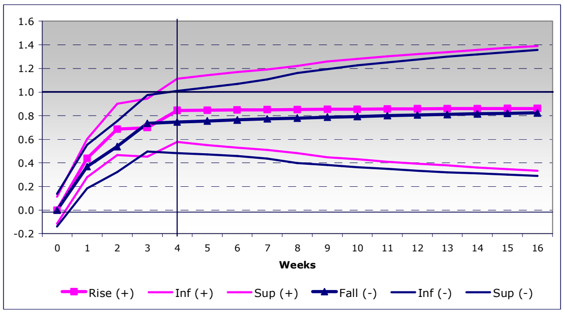
(ii) MED: Italy, Greece, Austria, Spain with a 66.2% weight, France with a 33.5% weight, and the EU15 average with weights of 30.6% and 37.1% for IO95 gasoline and diesel respectively.

Illustration 6 – Austria: CIRF (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: "Platts CIF -> APPBT for Diesel"



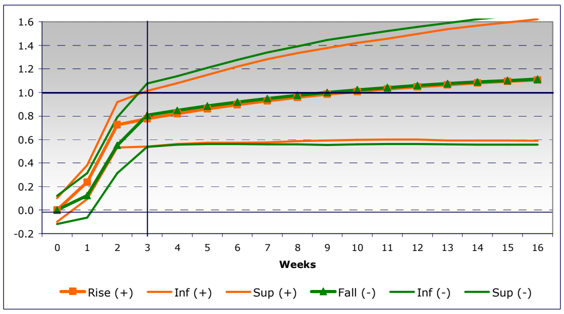
AUSTRIA: "Platts CIF -> APPBT for IO95 Gasoline"



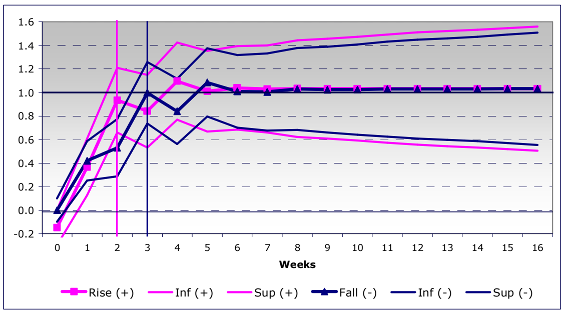
	AUSTRIA (MED)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.123	0.123	0.000	-0.158	0.158	0.000	-0.114	0.114	0.000	-0.139	0.139
1	0.575	0.363	0.788	0.483	0.252	0.713	0.440	0.279	0.601	0.369	0.184	0.555
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 7 – Greece: CIRF (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: "Platts CIF -> APPBT for Diesel"



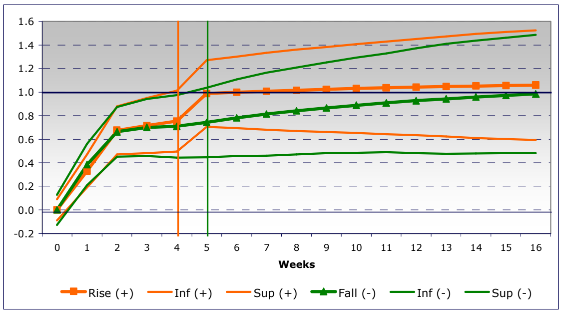
GREECE: "Platts CIF -> APPBT for IO95 Gasoline"



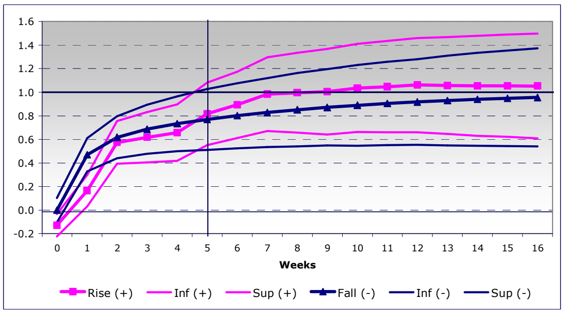
	GREECE (MED)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.101	0.101	0.000	-0.119	0.119	-0.147	-0.297	0.003	0.000	-0.100	0.100
1	0.238	0.094	0.381	0.125	-0.064	0.313	0.367	0.126	0.608	0.420	0.254	0.586
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 8 – Italy: CIRF (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: "Platts CIF -> APPBT for Diesel"



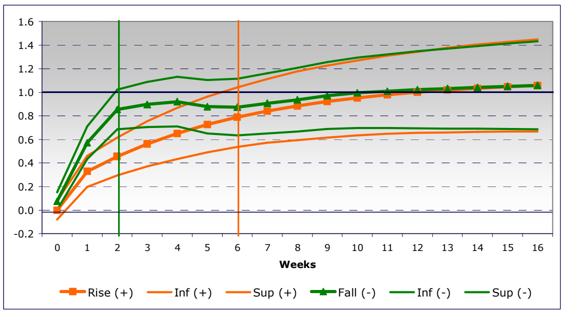
ITALY: "Platts CIF -> APPBT for IO95 Gasoline"



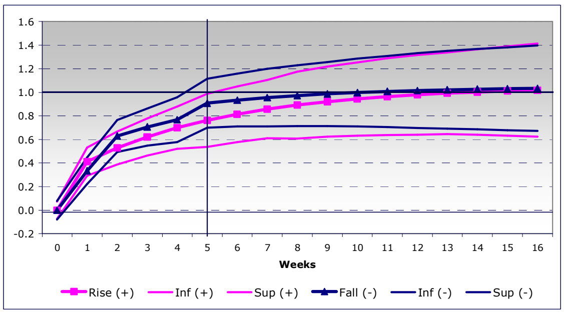
	ITALY (MED)											
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.089	0.089	0.000	-0.128	0.128	-0.129	-0.224	-0.033	0.000	-0.102	0.102
1	0.330	0.190	0.470	0.385	0.210	0.560	0.166	0.033	0.300	0.471	0.328	0.613
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 9 – Spain: CIRF (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: "Platts CIF -> APPBT for Diesel"



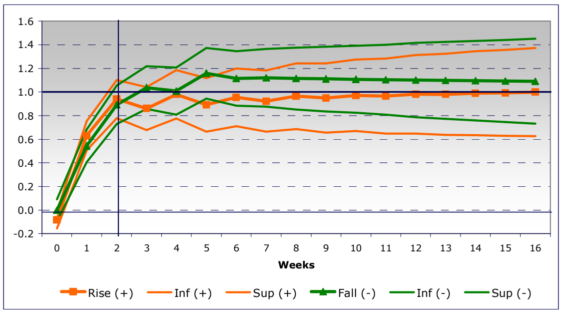
SPAIN: "Platts CIF -> APPBT for IO95 Gasoline"



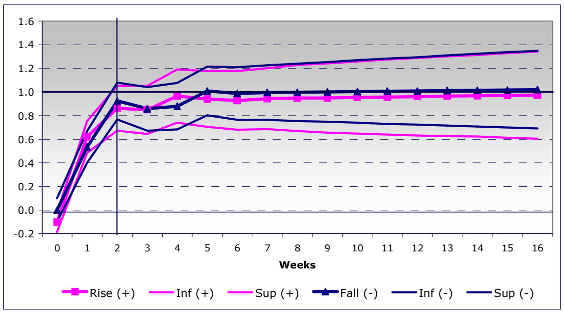
	SPAIN (66.1% MED & 33.9% NWE)											
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.079	0.079	0.076	0.002	0.150	0.000	-0.073	0.073	0.000	-0.079	0.079
1	0.329	0.197	0.461	0.572	0.434	0.710	0.412	0.293	0.532	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 10 – France: CIRF (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: "Platts CIF -> APPBT for Diesel"



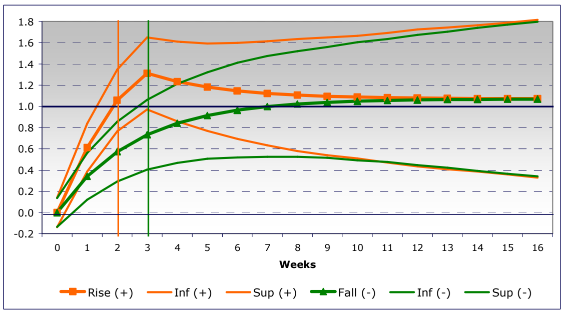
FRANCE: "Platts CIF -> APPBT for IO95 Gasoline"



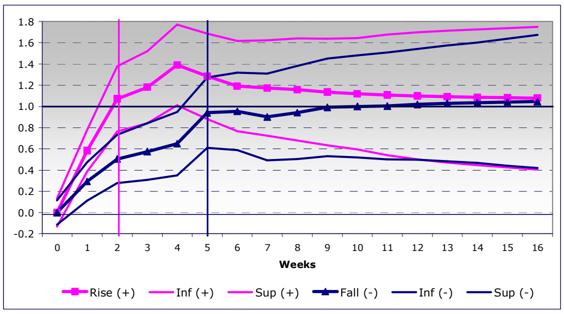
	FRANCE (33.5% MED & 66.5% NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	-0.081	-0.154	-0.009	0.000	-0.092	0.092	-0.102	-0.185	-0.019	0.000	-0.100	0.100
1	0.630	0.507	0.754	0.544	0.406	0.682	0.619	0.484	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 11 – Belgium: CIRF (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: "Platts CIF -> APPBT for Diesel"



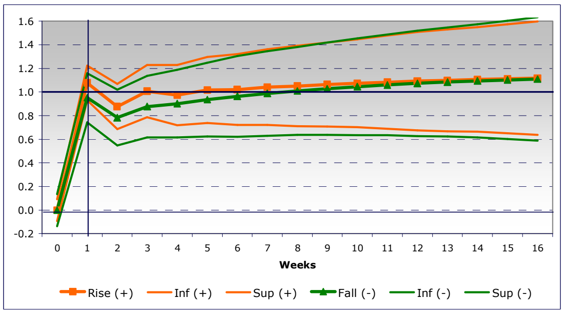
BELGIUM: "Platts CIF -> APPBT for IO95 Gasoline"



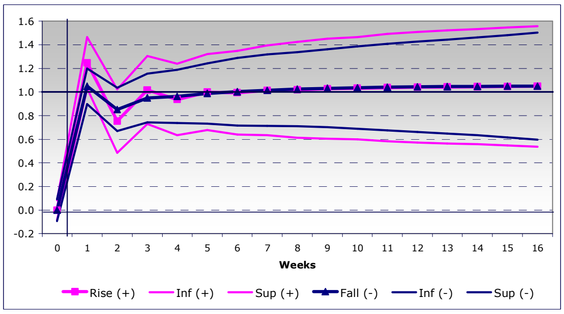
	BELGIUM (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.140	0.140	0.000	-0.134	0.134	0.000	-0.133	0.133	0.000	-0.114	0.114
1	0.613	0.388	0.837	0.342	0.123	0.561	0.583	0.388	0.779	0.293	0.112	0.473
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 12 – Denmark: CIRF (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: "Platts CIF -> APPBT for Diesel"



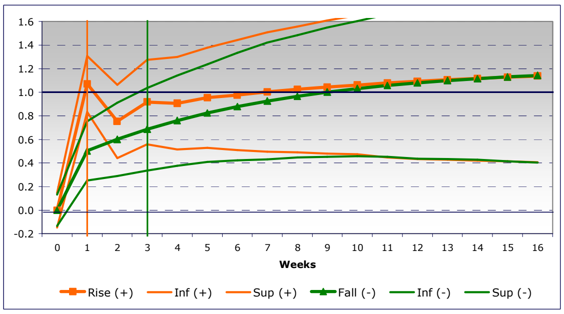
DENMARK: "Platts CIF -> APPBT for IO95 Gasoline"



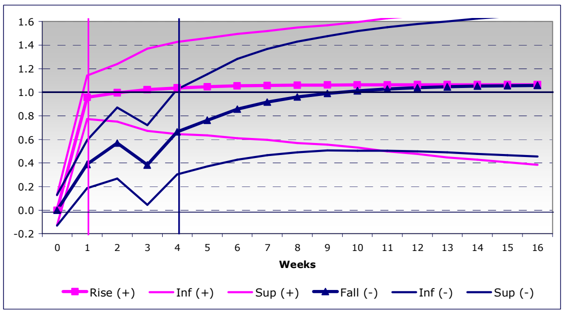
	DENMARK (NWE)											
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.092	0.092	0.000	-0.136	0.136	0.000	-0.084	0.084	0.000	-0.092	0.092
1	1.077	0.930	**1.223**	0.950	0.744	**1.157**	1.247	1.030	**1.465**	1.048	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 13 – Finland: CIRF (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: "Platts CIF -> APPBT for Diesel"



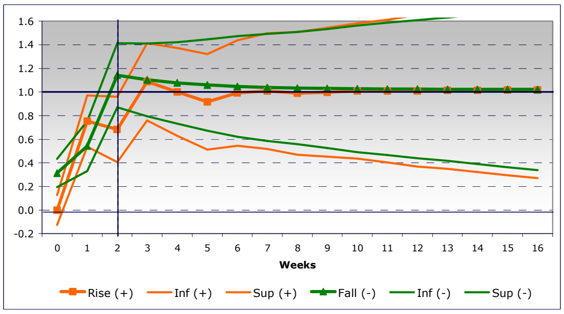
FINLAND: "Platts CIF -> APPBT for IO95 Gasoline"



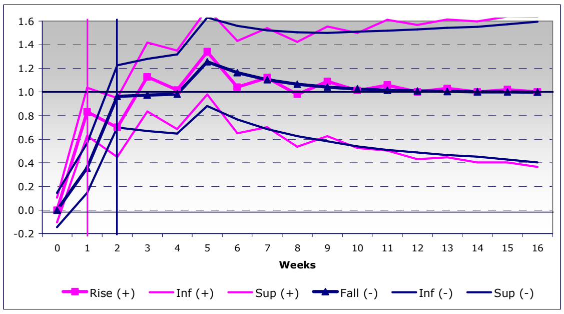
	FINLAND (NWE)											
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.146	0.146	0.000	-0.133	0.133	0.000	-0.127	0.127	0.000	-0.130	0.130
1	1.070	0.832	**1.308**	0.502	0.252	0.753	0.957	0.772	**1.142**	0.389	0.186	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 14 – Germany: CIRF (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: "Platts CIF -> APPBT for Diesel"



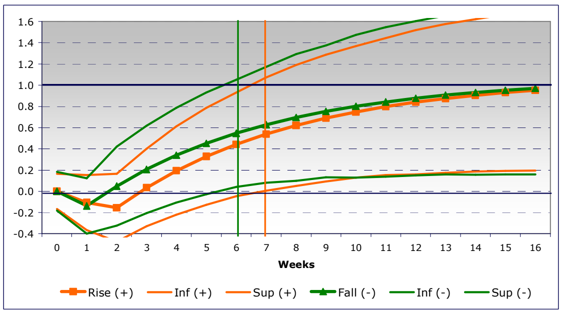
GERMANY: "Platts CIF -> APPBT for IO95 Gasoline"



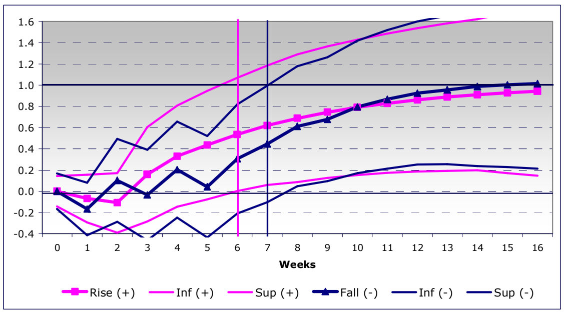
	GERMANY (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.126	0.126	0.314	0.194	0.433	0.000	-0.105	0.105	0.000	-0.145	0.145
1	0.753	0.536	**0.970**	0.541	0.330	0.753	0.833	0.629	**1.036**	0.356	0.147	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 15 – Ireland: CIRF (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: "Platts CIF -> APPBT for Diesel"



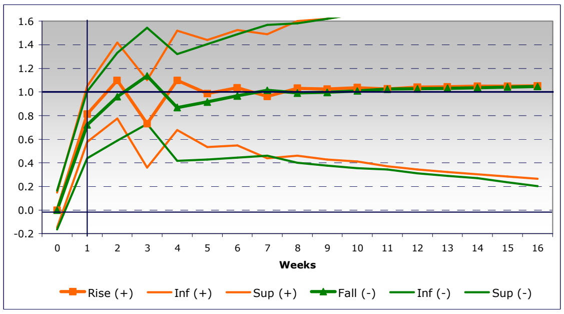
IRELAND: "Platts CIF -> APPBT for IO95 Gasoline"



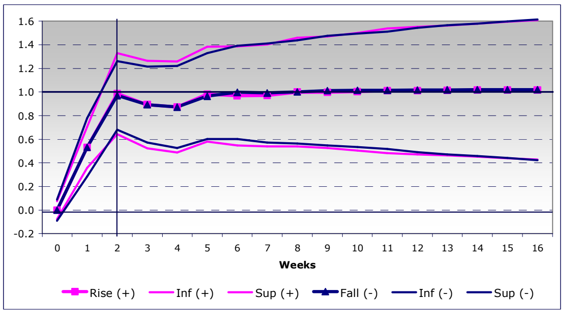
	IRELAND (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.167	0.167	0.000	-0.182	0.182	0.000	-0.144	0.144	0.000	-0.167	0.167
1	-0.105	-0.364	0.154	-0.138	-0.399	0.124	-0.068	-0.292	0.157	-0.166	-0.415	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 16 – Luxembourg: CIRF (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: "Platts CIF -> APPBT for Diesel"



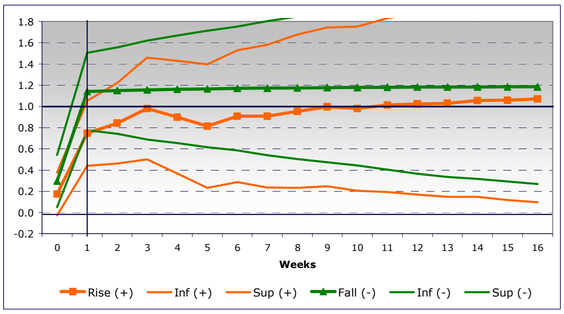
LUXEMBOURG: "Platts CIF -> APPBT for IO95 Gasoline"



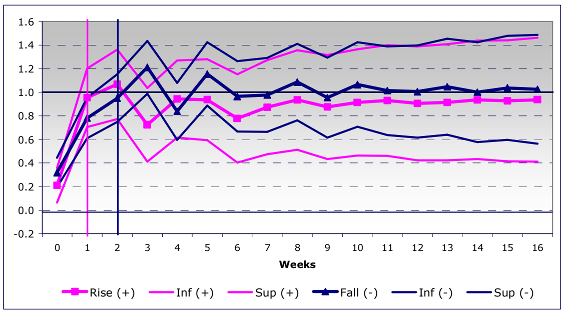
LUXEMBOURG (NWE)												
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.148	0.148	0.000	-0.164	0.164	0.000	-0.076	0.076	0.000	-0.089	0.089
1	0.813	0.578	**1.048**	0.722	0.439	**1.004**	0.531	0.357	0.704	0.531	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 17 – Netherlands: CIRF (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: "Platts CIF -> APPBT for Diesel"



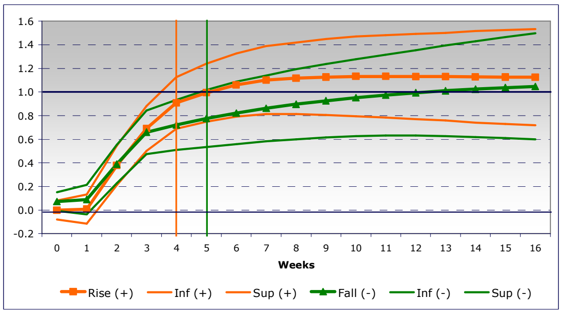
NETHERLANDS: "Platts CIF -> APPBT for IO95 Gasoline"



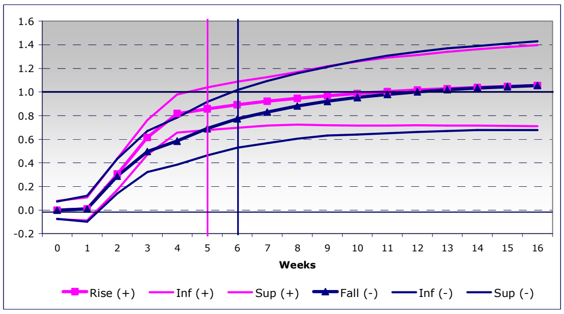
NETHERLANDS (NWE)												
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.176	-0.026	0.377	0.296	0.050	0.542	0.211	0.064	0.358	0.319	0.195	0.443
1	0.747	0.442	**1.052**	1.140	0.775	**1.504**	0.953	0.704	**1.201**	0.782	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 18 – Portugal: CIRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Platts CIF → APPBT", for Diesel and I095 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective Platts CIF price

PORTUGAL: "Platts CIF -> APPBT for Diesel"



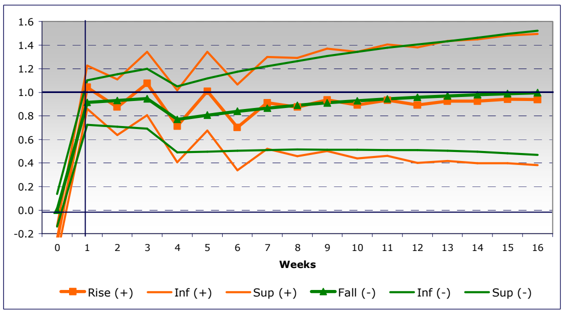
PORTUGAL: "Platts CIF -> APPBT for I095 Gasoline"



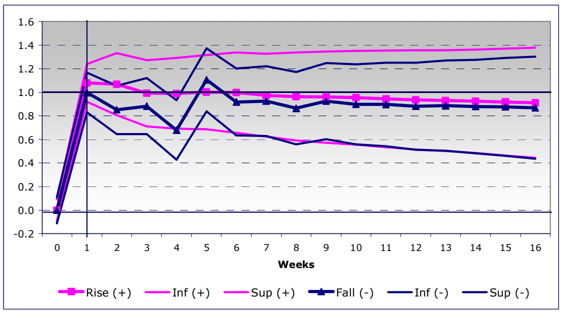
	PORTUGAL (NWE)											
	Diesel						I095 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.081	0.081	0.072	-0.007	0.152	0.000	-0.078	0.078	0.000	-0.073	0.073
1	0.009	-0.115	0.133	0.090	-0.034	0.214	0.010	-0.088	0.108	0.011	-0.097	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 19 – Sweden: CIRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Platts CIF → APPBT", for Diesel and I095 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective Platts CIF price

SWEDEN: "Platts CIF -> APPBT for Diesel"

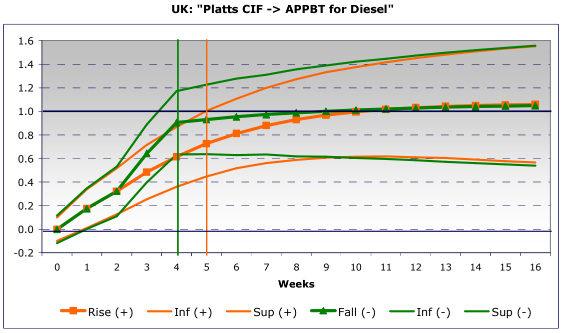


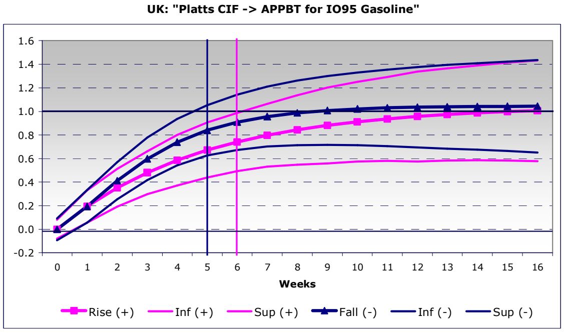
SWEDEN: "Platts CIF -> APPBT for I095 Gasoline"



	SWEDEN (NWE)											
	Diesel						I095 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	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

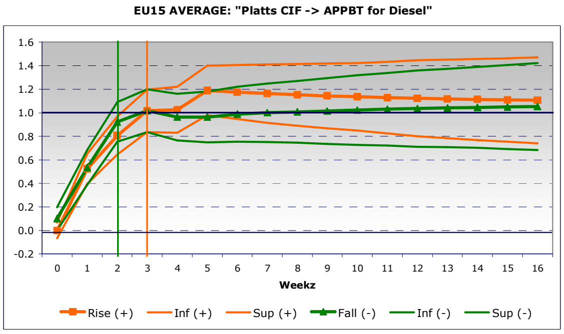
Illustration 20 – UK: CIRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Platts CIF → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective Platts CIF price

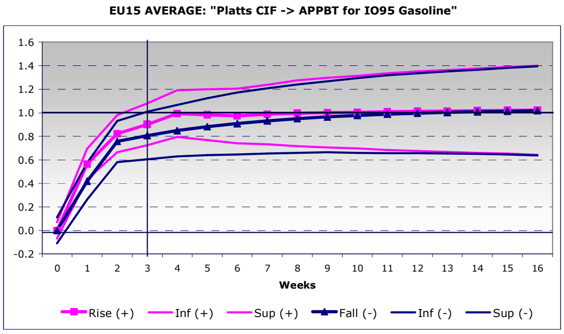




	UK (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.100	0.100	0.000	-0.116	0.116	0.000	-0.080	0.080	0.000	-0.091	0.091
1	0.175	0.011	0.340	0.175	0.003	0.348	0.194	0.057	0.331	0.194	0.056	0.332
2	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

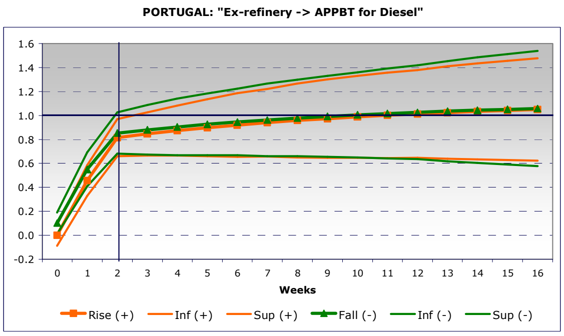
Illustration 21 – EU15 average: CIRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Platts CIF → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the respective Platts CIF price

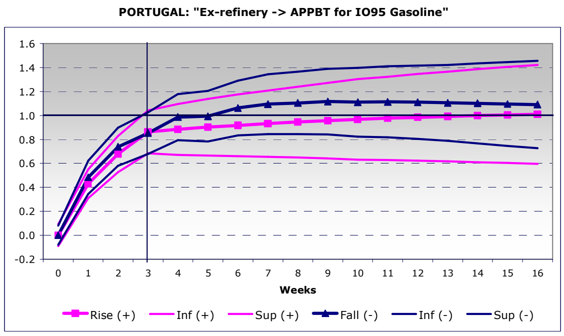




	EU15 AVERAGE											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.066	0.066	0.101	0.003	0.199	0.000	-0.070	0.070	0.000	-0.110	0.110
1	0.524	0.397	0.651	0.536	0.389	0.683	0.564	0.434	0.695	0.418	0.262	0.575
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

Illustration 22 – National channel "Ex-refinery → APPBT": CCIRF (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



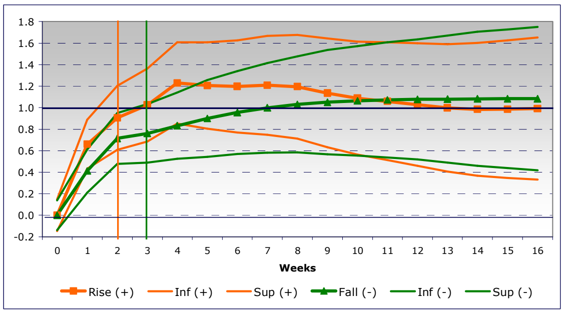


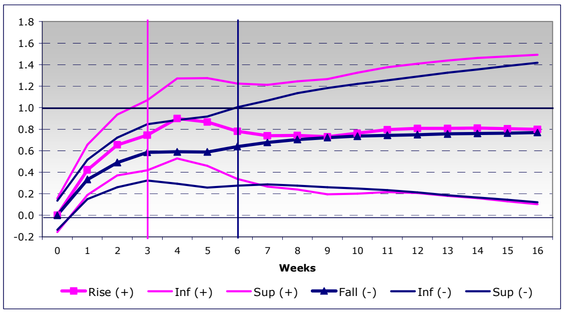
	PORTUGAL: "Ex-refinery -> APPBT"											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.088	0.088	0.101	0.011	0.191	0.000	-0.090	0.090	0.000	-0.080	0.080
1	0.456	0.328	0.584	0.549	0.407	0.691	0.431	0.309	0.552	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

A2.3.3. Integrated domestic channels "Brent → APPBT"

I present below the CIRF estimates and corresponding CI (95%) for 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 Brent (see Illustrations below).

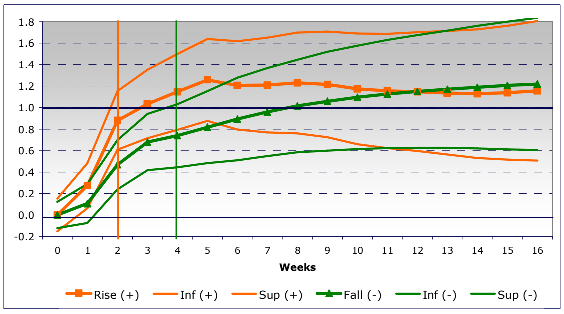
Illustration 23 – Austria: CIRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Brent → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the price for Brent

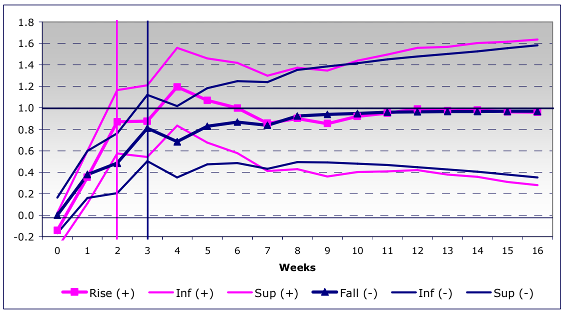




	AUSTRIA (MED)											
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.147	0.147	0.000	-0.138	0.138	0.000	-0.156	0.156	0.000	-0.135	0.135
1	0.661	0.432	0.889	0.412	0.211	0.614	0.423	0.190	0.656	0.334	0.151	0.516
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 24 – Greece: CIRF (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

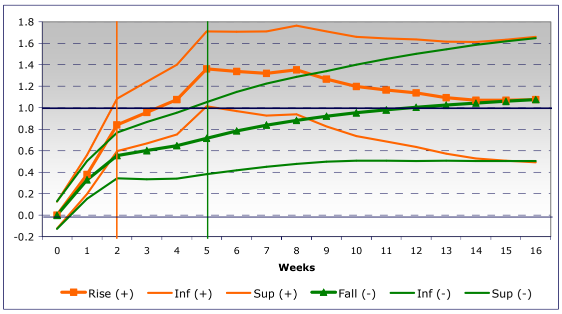




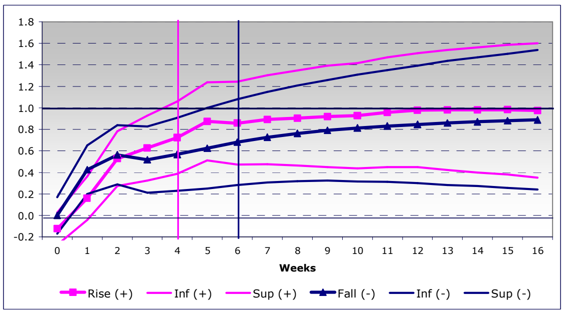
	GREECE (MED)											
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.151	0.151	0.000	-0.122	0.122	-0.141	-0.304	0.022	0.000	-0.165	0.165
1	0.273	0.062	0.483	0.106	-0.075	0.287	0.354	0.110	0.599	0.379	0.161	0.598
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 25 – Italy: CIRF (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: "Brent -> APPBT for Diesel"



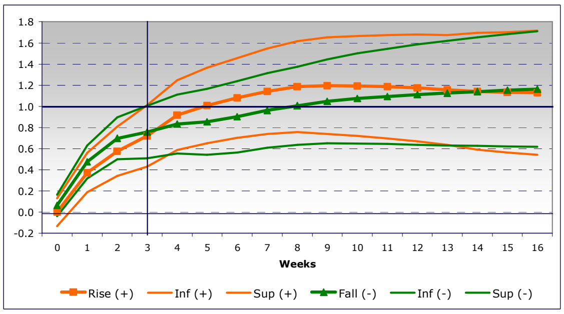
ITALY: "Brent -> APPBT for IO95 Gasoline"



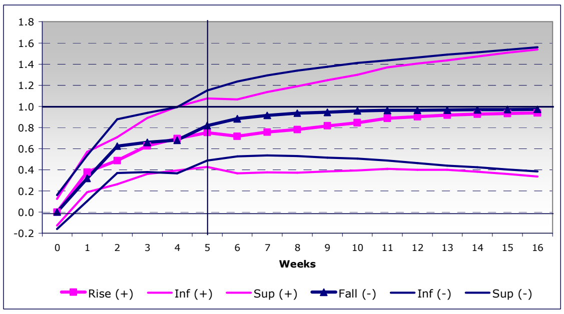
	ITALY (MED)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.124	0.124	0.000	-0.126	0.126	-0.124	-0.273	0.026	0.000	-0.170	0.170
1	0.379	0.197	0.561	0.329	0.153	0.504	0.161	-0.042	0.364	0.425	0.201	0.650
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 26 – Spain: CIRF (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: "Brent -> APPBT for Diesel"

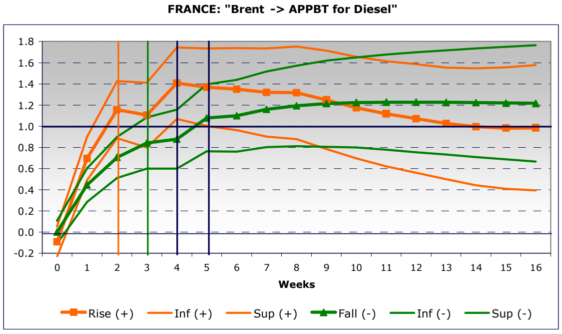


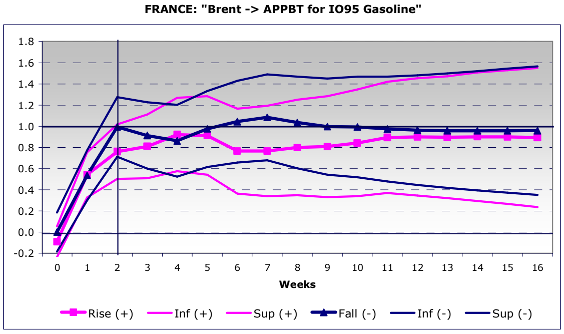
SPAIN: "Brent -> APPBT for IO95 Gasoline"



	SPAIN (66.1% MED & 33.9% NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	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

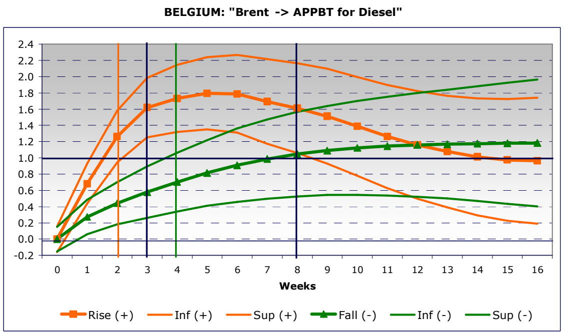
Illustration 27 – France: CIRF (in cts/lt) and corresponding CI (95%) estimates on the channel "Brent → APPBT", for Diesel and IO95 Gasoline, and disentangled between a 1 cts/lt rise and fall of the price for Brent

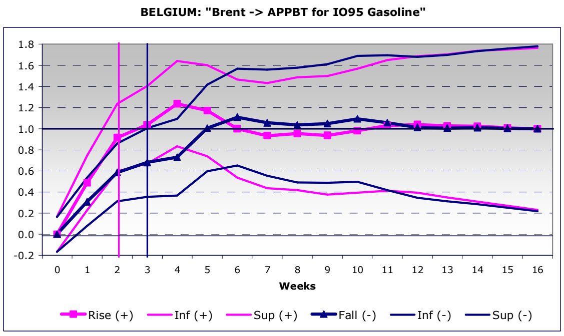




	FRANCE (33.5% MED & 66.5% NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	-0.092	-0.237	0.053	0.000	-0.107	0.107	-0.090	-0.236	0.057	0.000	-0.184	0.184
1	0.696	0.492	0.901	0.445	0.287	0.604	0.542	0.329	0.754	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 28 – Belgium: CIRF (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

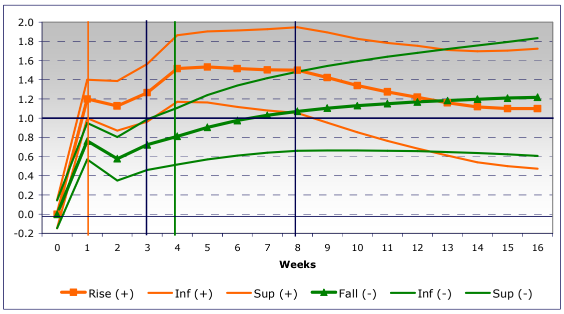




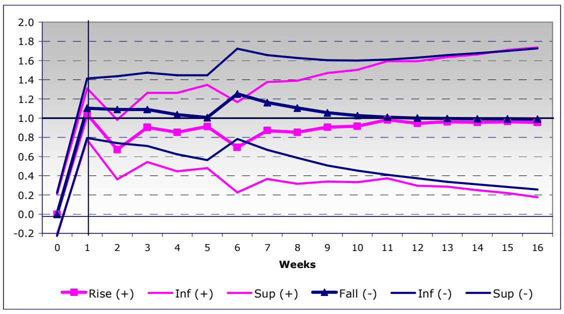
	BELGIUM (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.157	0.157	0.000	-0.152	0.152	0.000	-0.167	0.167	0.000	-0.165	0.165
1	0.682	0.436	0.928	0.274	0.063	0.485	0.487	0.230	0.745	0.309	0.080	0.537
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 29 – Denmark: CIRF (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: "Brent -> APPBT for Diesel"



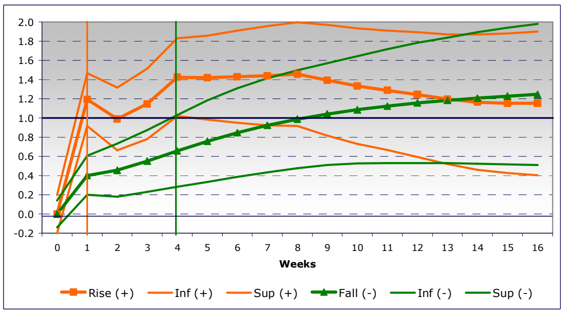
DENMARK: "Brent -> APPBT for IO95 Gasoline"



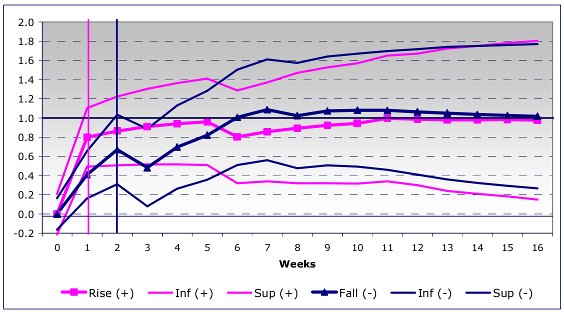
	DENMARK (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.146	0.146	0.000	-0.145	0.145	0.000	-0.208	0.208	0.000	-0.225	0.225
1	1.199	0.999	**1.399**	0.762	0.573	0.951	1.042	0.774	**1.310**	1.104	0.795	**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 30 – Finland: CIRF (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: "Brent -> APPBT for Diesel"



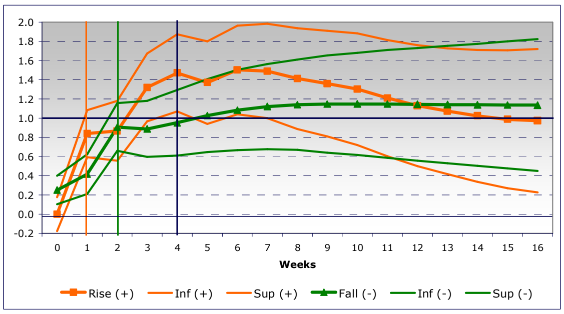
FINLAND: "Brent -> APPBT for IO95 Gasoline"



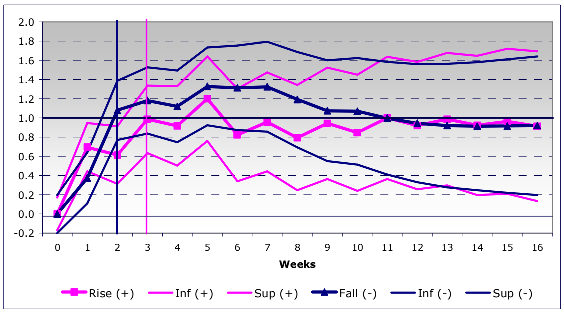
	FINLAND (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.197	0.197	0.000	-0.139	0.139	0.000	-0.211	0.211	0.000	-0.163	0.163
1	1.192	0.918	**1.466**	0.403	0.200	0.606	0.799	0.496	**1.103**	0.410	0.163	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 31 – Germany: CIRF (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: "Brent -> APPBT for Diesel"



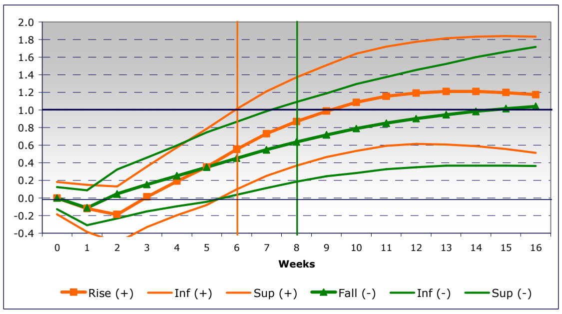
GERMANY: "Brent -> APPBT for IO95 Gasoline"



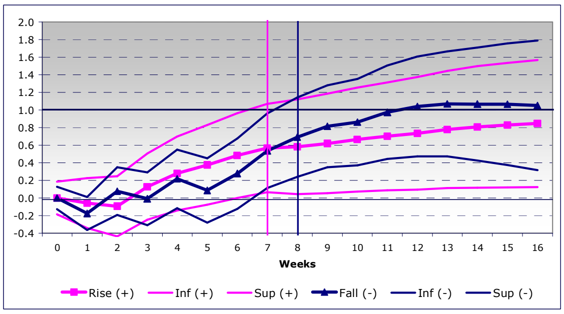
	GERMANY (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	**CIRF**	**Inf.**	**Sup.**	**CIRF**	**Inf.**	**Sup.**	**CIRF**	**Inf.**	**Sup.**	**CIRF**	**Inf.**	**Sup.**
0	0.000	-0.177	0.177	0.251	0.103	0.399	0.000	-0.170	0.170	0.000	-0.198	0.198
1	0.839	0.594	**1.083**	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 32 – Ireland: CIRF (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: "Brent -> APPBT for Diesel"



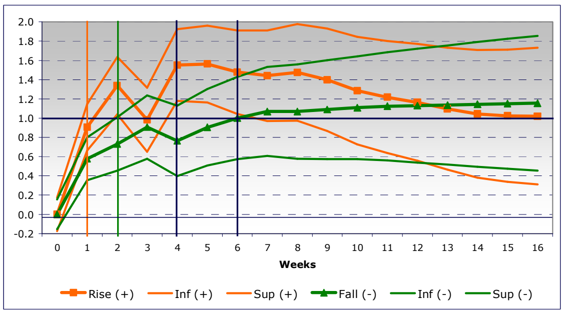
IRELAND: "Brent -> APPBT for IO95 Gasoline"



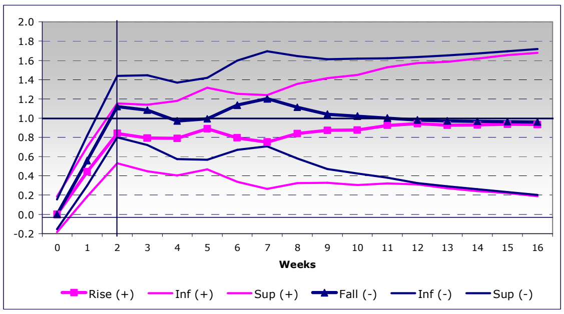
	IRELAND (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	**CIRF**	**Inf.**	**Sup.**	**CIRF**	**Inf.**	**Sup.**	**CIRF**	**Inf.**	**Sup.**	**CIRF**	**Inf.**	**Sup.**
0	0.000	-0.183	0.183	0.000	-0.125	0.125	0.000	-0.186	0.186	0.000	-0.127	0.127
1	-0.117	-0.385	0.151	-0.110	-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 33 – Luxembourg: CIRF (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: "Brent -> APPBT for Diesel"



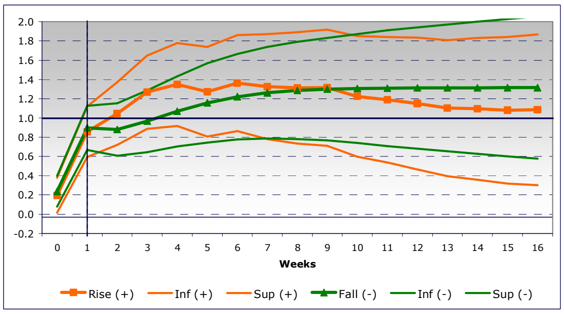
LUXEMBOURG: "Brent -> APPBT for IO95 Gasoline"



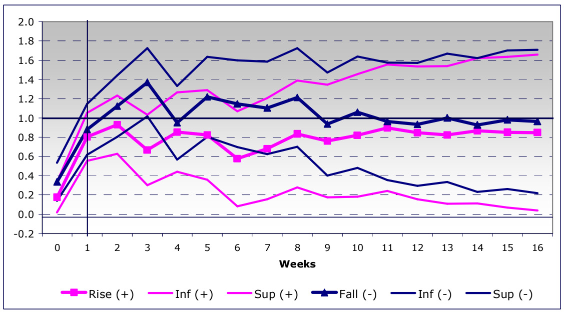
	LUXEMBOURG (NWE)											
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.175	0.175	0.000	-0.155	0.155	0.000	-0.184	0.184	0.000	-0.155	0.155
1	0.906	0.664	**1.148**	0.578	0.356	0.801	0.443	0.185	0.701	0.559	0.299	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 34 – Netherlands: CIRF (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: "Brent -> APPBT for Diesel"



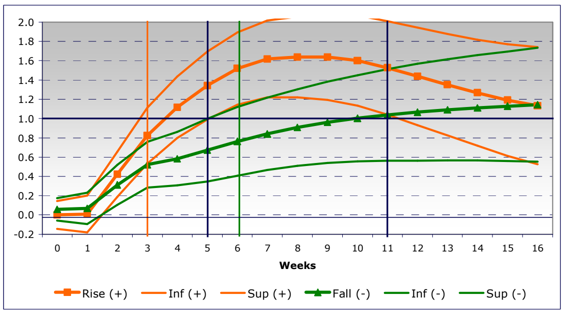
NETHERLANDS: "Brent -> APPBT for IO95 Gasoline"



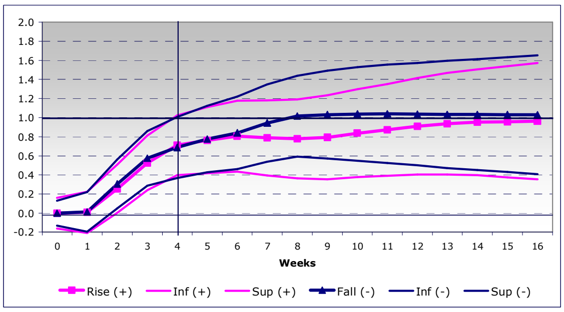
	NETHERLANDS (NWE)											
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.196	0.014	0.377	0.237	0.078	0.397	0.177	0.020	0.334	0.336	0.137	0.535
1	0.857	0.592	**1.121**	0.898	0.669	**1.128**	0.803	0.554	**1.052**	0.882	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 35 – Portugal: CIRF (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: "Brent -> APPBT for Diesel"



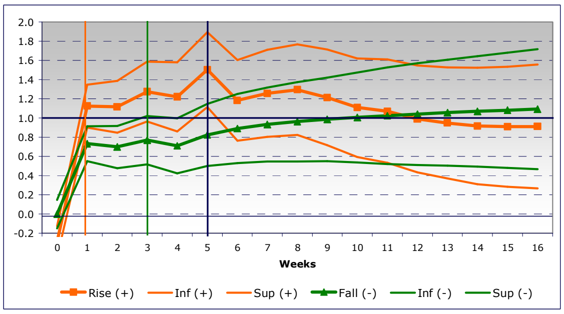
PORTUGAL: "Brent -> APPBT for IO95 Gasoline"



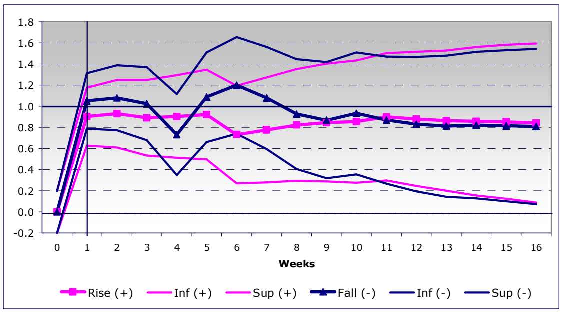
	PORTUGAL (NWE)											
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.144	0.144	0.058	-0.058	0.175	0.000	-0.160	0.160	0.000	-0.130	0.130
1	0.010	-0.181	0.200	0.068	-0.095	0.231	0.008	-0.207	0.224	0.012	-0.196	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 36 – Sweden: CIRF (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: "Brent -> APPBT for Diesel"



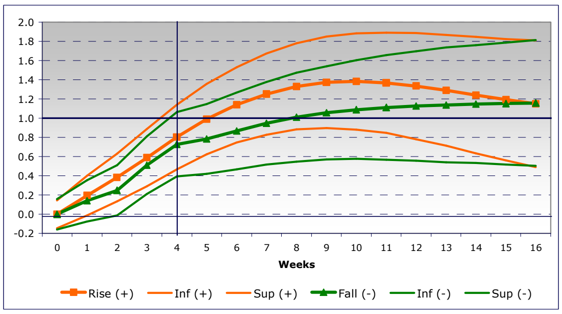
SWEDEN: "Brent -> APPBT for IO95 Gasoline"



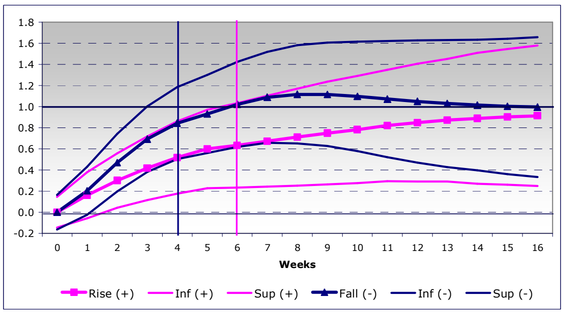
	SWEDEN (NWE)											
	Diesel						IO95 Gasoline					
	Rise			Fall			Rise			Fall		
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	-0.288	-0.449	-0.126	0.000	-0.148	0.148	0.000	-0.203	0.203	0.000	-0.198	0.198
1	1.126	0.902	**1.349**	0.732	0.551	0.913	0.903	0.629	**1.176**	1.051	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 37 – UK: CIRF (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: "Brent -> APPBT for Diesel"



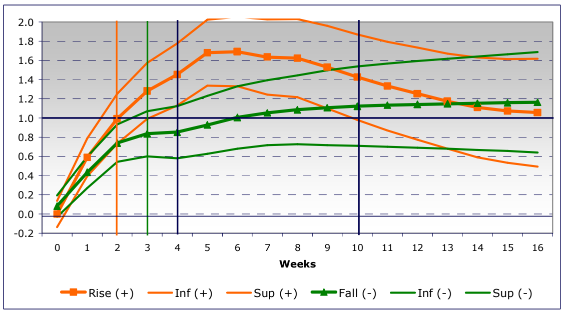
UK: "Brent -> APPBT for IO95 Gasoline"



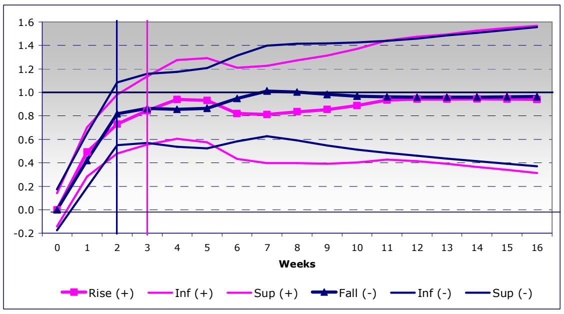
	UK (NWE)											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.
0	0.000	-0.144	0.144	0.000	-0.159	0.159	0.000	-0.146	0.146	0.000	-0.163	0.163
1	0.195	-0.012	0.403	0.141	-0.074	0.355	0.162	-0.055	0.380	0.205	-0.022	0.432
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 38 – EU15 average: CIRF (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: "Brent -> APPBT for Diesel"



EU15 AVERAGE: "Brent -> APPBT for IO95 Gasoline"



	EU15 AVERAGE											
	Diesel						IO95 Gasoline					
		Rise			Fall			Rise			Fall	
Weeks	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	Inf.	Sup.	CIRF	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