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Mergers between natural gas suppliers and electricity generators: Should European consumers be concerned?

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Paper presented at: Seminários de Investigação, AdC, Lisboa
30 de Outubro 2015

Outline

1 – **MOTIVATION**

2 - **RESEARCH QUESTION**

3 – **FRAMEWORK**

4 - **EMPIRICAL STUDY**

5 - **CONCLUSIONS**

1. MOTIVATION

- Liberalisation of energy markets created the opportunity for cross-sectorial mergers in Europe
- Natural gas is one of the main sources for electricity generator, these mergers attracted special attention from regulators and general public.
- The electricity and gas industry around the world and in Europe, in particular, have witnessed a trend towards integration.
- Most studies do not consider directly effects on consumers
- The results on literature about the effects on consumers are not clear.

2. RESEARCH QUESTION

Empirically assess the effects of VI between natural gas suppliers and electricity generators on consumer welfare...
Therefore…

effects on **P** and **quantity available** for consumption

In the first instance, a practice is against the consumer interest if it raises prices.

3. FRAMEWORK

- two perspectives:

VI (vertically interrelated markets)

or

convergence merger (actual and potential competitors)

[an electricity firm acquiring a firm with activity in the gas sector or vice-versa]

3.1. Literature on VI

There is some **ambiguity** on the conclusions about consequences and there are **few clear predictions** on the effects on final consumers.

focus on the effects of VI **on competition**, instead of effects on final prices.

Study on effects of vertical integration on competition

efficiency gains and market foreclosure

problems of coordination solved

costs of transaction are eliminated

Economies of scope

increase the costs of its competitors

may increase market power

	effect on consumers (+)
Spengler (1950)	+
Lafontaine (1995)	+
Lafontaine (2003)	+
Riordan (1998)	+
Shepard (1993)	+
McBride (1983)	+
Ford and Jackson (1997)	+
Saltzman et al (1999)	+
Church (2008)	+
Lafontaine and Slade (2003)	+ (13)

	effect on consumers (-)
Michaels (2004)	-
Gilbert and Hastings (1999)	-
Cuellar and Gertler (2006)	-
Ashenfelter and Hosken (2008)	-

	no effect on consumers
Waterman and Weiss (1996)	no effect
Hortacsu and Syverson (2007)	no effect
Lafontaine and Slade (2003)	ambiguous (3)

3.2. Literature on convergence VI

there is no consensus on whether VI has positive or negative effects on final prices, particularly between electricity and gas activities.

	effect on consumers
Brennan (2001)	no mention
Gilbert and Newbery (2006)	+
Hunger (2003)	+
Miccola et al (2008)	+
Bushnell et al (2008)	+
Hogan and Meade 2007)	+
Knittel (2003)	-
Kennedy (1977)	-

3.3 - Cross-sector mergers in Europe: main drivers and evolution

Following the liberalisation, European firms appear to be reshaping their business strategies accordingly

wave of M&A

the growing integration between the two activities in the same firm presents challenges to competition authorities.

All mergers occurred in Europe from 1998 to 2007 in electricity and gas sectors {from Lévêque and Monturus (2007)}

247 mergers and acquisitions (M&A) involving firms with businesses along the electricity and gas value chain → 116 are cross-sector VI

	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		
	s1	s2	s1	s2	s1	s2	s1	s2	s1	s2	s1	s2	s1	s2	s1	s2	s1	s2	s1	s2	Total
AU	1								1												2
BE									1		1		1			2					5
DK	1						1								1		1				4
FI	1				1		1		1				1				1				6
FR														1	1				1	1	4
GE			1		5		3		8	1	2		2		2		2				26
GR													1								1
IT							1		1	1	3	1	5	1	1		2	3	3	1	23
NE			2	1	2	1			1		2		1		1						11
PT					1										1		1		1		4
SP									1		1	1			1		1		2		7
SW	1			1		1	2		1				1								7
UK		2	2	1	1	1	1		2	2	2		1						1		16
Total	4	2	5	3	10	3	9	0	17	4	11	2	13	2	8	2	8	3	8	2	116

(1) acquires (2)		
(1)	(2)	
P+G	G	28
P+G	P	27
G	P+G	1
P+G	P+G	39
P	P+G	3
pure mergers		3

Cross-sectorial mergers by country and year, 1998 to 2007

4. EMPIRICAL STUDY

4.1 RELEVANT MARKET

Key factor in any study of a merger case and it may affect the final outcome of any merger assessment.

"(...) the area in which the undertakings concerned are involved in the supply and demand of products or services, in which the conditions of competition are sufficiently homogeneous and which can be distinguished from neighboring areas because the conditions of competition are appreciably different in those areas".

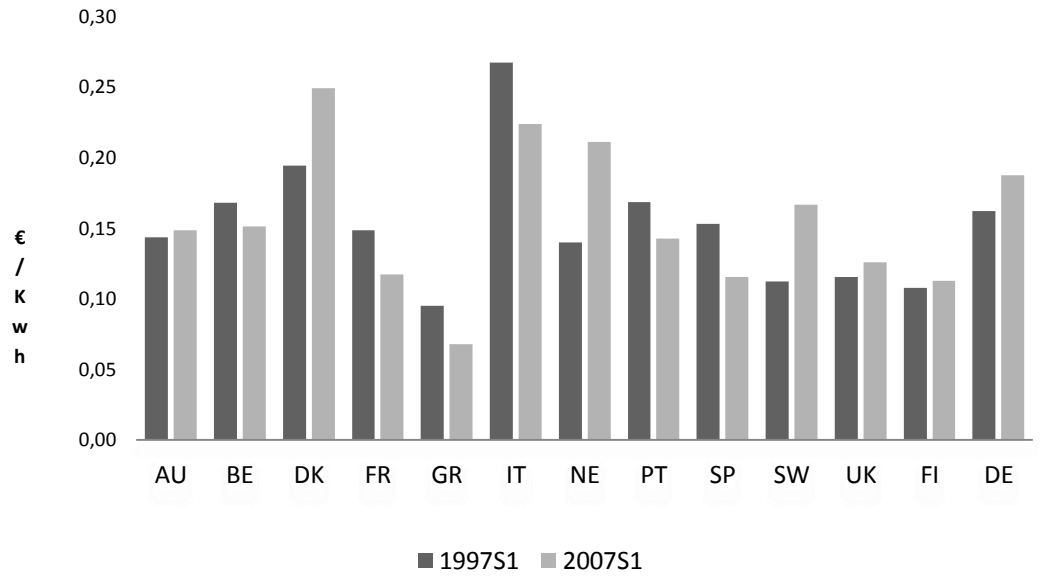
Several reasons made us define it according to the traditional approach: **the market in each Member State has still to be considered as a separate market**

Relevant criteria

- price differences between countries;
- interconnection capacity;
- cross-border trade

Price differences between countries

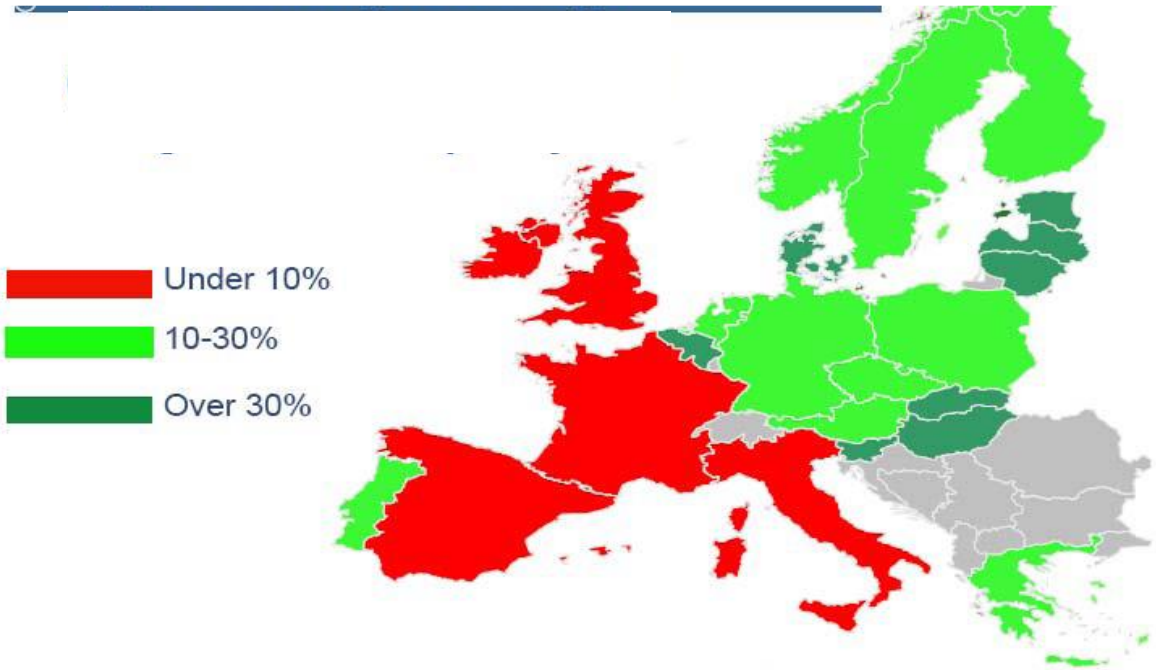
Electricity prices (household consumers) with taxes 1997 and 2007



Source: Eurostat

Interconnection capacity

Electricity Market: Cross border capacity across Europe, 2006



Source: ERGEG, 2007

Cross-border trade

Exports, **in all European countries**, except France and countries from Nord Pool, **exports are marginal,** assuming also less than 10% of national consumption of electricity

Imports as percentage of national consumption (%), 1997-2007

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
AU	19	21	23	27	27	29	35	30	35	37	37
BE	14	11	12	15	20	21	18	18	18	23	19
DE	12	10	15	26	25	27	22	26	39	20	31
FI	12	13	15	16	15	17	15	14	22	16	18
FR	1	1	1	1	1	1	2	2	2	2	3
GE	8	8	9	9	9	10	10	9	11	9	9
GR	8	6	4	4	8	10	9	10	11	12	12
IT	16	16	16	16	18	18	18	16	17	15	16
NE	15	13	24	23	22	21	21	20	23	26	21
PT	17	12	10	12	9	13	14	19	21	18	20
SP	3	5	7	7	5	6	4	4	4	4	3
SW	8	5	7	14	8	15	19	12	11	13	12
UK	5	4	4	4	3	3	2	3	3	3	3

Source: Eurostat

Cross-border trade **is still too limited** for the markets to be considered larger than national markets.

4.2 SELECTION OF MERGERS

Set of conditions determined by the aim of our research:

(a) the acquisition represents more than 50% of the acquired firm;

(b) a merger has to be cross-sectorial

(c) contains only mergers where a gas supplier acquires a firm whose activity on electricity value chain does not include supply.

1) Neste/IVO (Finland) 2) EOn/Ruhrgas (Germany)

We exclude also British Electricity / Swalec (UK)

** were controversial and posed some question on the risk of competitive harm;*
** somehow the risk was not large enough to be blocked or, alternatively, it was blocked but there were some other factors that justified allowing the transaction after all.*

Neste/IVO (FI)

14th of April of 1998 — notification of a proposed concentration between two stated-owned firms

IVO: largest Finnish company in the energy sector

Neste: considered by the Finnish Competition Authority as having a dominant position in the Finnish natural gas market (1992) **- Gasum Oy: Only importer granted)**

Result: a holding company where the State keeps 100% of the capital.

EC assessment : first stage - an internal reorganisation;
second stage - merger, according to European merger regulation.

Raised particular concerns, *due to the potential monopoly position assumed by the new merged firm in the market of natural gas in the future and* ***might lead to effective monopoly****, not only on natural gas market but also on electricity market.*

Neste/IVO (FI)

Mention in EC report: - the merged entity would, as a result of the vertical links between the sectors and the accumulated position in both markets, be in a position to successfully adopt potential strategies identified as detrimental .

Raised serious doubts as to its compatibility with the common market

EC decided to block the proposed merger.

Remedies: Resign Neste's control over Gasum (a subsidiary firm) by the divestiture of 50% of the company's shares.

The Finnish Government made a commitment to ensure that the merged firm would remain a minority shareowner of Gasum.

EC decided not to oppose to the notified operation

EOn/Ruhrgas (GE)

2001 firms announced the intention to merge

EOn (with RWE): joint dominant position in the electricity market

Ruhrgas : dominant gas supplier in the country; controlled almost all gas deliveries and gas imports

Result: A new global player in the power industry was created

Assessment from Federal Cartel Office and Monopolies Commission: several reasons for concern - feared significant market foreclosure effects on gas sales ;
- the merger might have consolidated the prior market dominance in both the gas and the electricity sector;
- new merged firm would have an incentive to discriminate against new competitors in the electricity generation , etc

Without appropriate remedies, this vertical merger could pose several constraints to competition - **both authorities blocked the merger.**

EOn/Ruhrgas (GE)

Some proposals were presented by the parties

these remedies were considered **very limited in scope, inappropriate and of little significance to prevent the main problem of strengthening the dominance in gas and electricity markets.**

the merging companies appealled to the German Minister for Economy and Technology

Although all negative evaluations and warnings, **on 5th July 2002, EOn obtained a ministerial permit to purchase the dominant gas company**

The EC was also called to give its assessment, but it **has repeatedly stated that the merger fell outside its jurisdiction**

4.3 – MODEL AND VARIABLES

Aim: assessing the effect of mergers on final electricity prices for household consumers

Formulate and estimate a **reduced form model** for the **determinants of electricity final prices** on several European markets.

$$P_{it} = \nu_i + \beta M_{it}^{j} + \lambda' X_{it} + Time + \mu_{it}$$

P: final price of electricity for household consumers in country i in period t

M: dummy variable **taking a value of zero for periods before the merger** for all countries and **a value of 1 for post-merger observations** for countries where a merger took place.

For each merger analysed we consider a **specific dummy variable**

Time: linear time trend

X: observed control variables that also influence final prices for electricity

Description of Independent Variables

Variable	Description	Source	Expected sign (coeff)
Costs (eur/Kwh)	weighted average of thermal fuel costs used on generation; weight: % of each fuel on country total	IAEE	+
Hydrogeneration (%)	% of hydro generation on generation mix	Eurostat	+/-
Nuclegeneration (%)	% of nuclear generation on generation mix	Eurostat	+
Income (millions eur)	Net national disposable income (B6NS1)	OECD	+
LabourCosts (1000eur)	Average personnel costs on electricity generation (per employee)	Eurostat	+
TPA (0/1)	Definition by Steiner (2001)	OECD	+
% natgasTh (%)	% of natural gas generation on total	Eurostat	-

$$P_{it} = \nu_i + \beta_1 M_{it}^{GE} + \beta_2 M_{it}^{FI} + \beta_3 Costs_{it-1} + \beta_4 hydrogeneration_{it} + \beta_5 nuclearg eneration_{it} + \beta_6 Income_{it} + \\ + \beta_7 Labour\,costs_{it} + \beta_8 Time + \beta_9 TPA_{it} + \beta_{10}\,\%natgas_{it} + \mu_{it}$$

Data problems: missing values and endogeneity

(A) Our database is an unbalanced panel… namely concerning cost data…

Method chosen: multiple imputation methods, by Rubin (1977)

(B) Endogeneity of the vertical cross-sectorial merger…

implement Instrumental Variable (IV) estimators

Instruments	description
Auth1	the distance of the electricity sectorial regulator index to the average of the country
	benchmark: average of the indicator for all sectorial regulator for each country
Auth2	the distance of the electricity sectorial regulator index to the average of the country
	benchmark: aggregate indicator of regulatory reforms indicator (REGREF) of each country
Auth3	compare with the indicator for electricity regulator and assumes 0 if it is less or equal to the anual average amd 1 otherwise
	benchmark: average of the indicator for all sectorial regulator for each year for all countries

4.4 – RESULTS AND DISCUSSION

Main concerns: the coefficients of the dummy variables defined for each of the chosen merger.

Dependent variable: P	
	Multiple Imputation
M_{GE}	.072**
	(.025)
M_{FI}	.050*
	(.020)
Costs_L1	.872*
	(.400)
Hydrogeneration	.052***
	(.0147)
Nucleageneration	.177**
	(.055)
Income	1.5e-09***
	(2.6e-10)
LabourCosts	.001***
	(.0003)
Time	-.001*
	(.0004)
TPA	.0087*
	(.004)
%natgas	-.077***
	(.012)
constant	.036
	(.020)
Nr. obser	273

Main results

(*) The parameter estimators with respect to the explanatory variables are **consistent with the economic intuition and are statistically significant.**

(*) The **cost of labour and the existence of TPA are statistically significant** in explaining the final price of electricity for household consumers. Even though, this industry is low labour intensity there seems to be a positive affect, even if very small.

(*) The positive and significant value of the coefficient of lagged weighted generation costs confirm the expectation: an increase on thermal cost of generation is split into two parts but both have a positive impact on price.

(*) The **positive and significant value of the coefficient of lagged weighted generation costs** confirm the expectation: an increase on thermal cost of generation is split into two parts but both have a positive impact on price.

(*) The share of hydrogeneration and of nuclear generation have a significant positive coefficient. The increase in the share of hydrogeneration in drought years (as in the period studied) may increase household prices. The same seems to happen with increases in nuclear generation share in total generation of the country.

(*) Time has a small negative impact on final prices, ceteris paribus, which means a decreasing time trend for household prices. This conclusion seems appropriate to support the positive effects in the last years after liberalisation in Europe for consumers, even if the decrease in prices, ceteris paribus, is not very large (it amounts to less that 1cent€).

Concerning the existence of VI (coefficientc of M)

(**) the existence of a VI between an electricity generator and a natural gas **supplier seems to increase in average the final price of electricity on markets where it occurs**.

(**) We found evidence that any household consumer in Germany pays a price for their electricity 1.8% higher because there was the merger between EOn and Ruhrgas.

(**) Even in Finland **household prices after the merger are, in average, around 2% higher than they would be without the merger between IVO and NESTE.**

5. CONCLUSIONS

The path towards a single, competitive European Energy market is being followed closely by a wave of mergers in electricity and gas sectors. **The ones involving either firms in the electricity and gas sectors had particular (mediatic) attention and regulation concerns.**

A cross-sectorial merger, when not associated with cross border acquisition, may be understood as an obstacle for the achievement of the full benefits of liberalisation and integration if it has a detrimental impact on prices.

Why these VI?

- Importance in both energy sectors.
- VI between a natural gas supplier and an electricity generator may expand the exercise of market power to both markets.
- The interventions of CA have been deeply criticized and our results may reinforce this criticism and call the attention for investigation .

5. CONCLUSIONS

Main objective: assess the effect of vertical integration between electricity generators and natural gas suppliers on final prices of electricity for household consumer.

Reduced model of the determinants of final price of electricity in several European countries

(unbalanced panel data from 13 European countries for 21 semesters [1997 and 2007])

[Germany - EOn and Ruhrgas; Finland - Neste and IVO]

Two main issues:

data missing and endogeneity of our explanatory variables of interest.

Apply solutions for these problems proposed in other empirical research

5. CONCLUSIONS

Three main findings:

A) the existence of a VI between an electricity generator and a natural gas **supplier seems to increase in average the final price of electricity on markets where it occurs**.

B) We found evidence that a household consumer in Germany **pays a price for their electricity 1.8% higher with the presence of the merger between EOn and Ruhrgas.**

C) Even in Finland, where the VI was not controversial and it involved public firms, **the effect on prices was equally detrimental to consumers**. **Household prices after the merger are around 2% higher than they would be without the merger between IVO and NESTE.**

5. CONCLUSIONS

Further research:

(i) some assumptions made may be relaxed (how the results would change if we assume that the impact of VI may have different effects depending on time from the event)

(ii) including long-run perspective, leaving out of the research some efficiency effects.

(iii) relax the assumption of isolated effects of the mergers on the country where the firm is incumbent - more realistic conclusions

iv) assessment of the features of cross-sectorial VI that increase the probability of detrimental impact on market prices.

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Thank You

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