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LIBERALIZATION OF ELECTRICITY RETAILING IN EUROPE:
COMING BACK OR GOING FORTH?

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Liberalization of electricity retailing in Europe: coming back or going forth?

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Abstract

The aim of this article is to provide a mid-term evaluation of liberalization of electricity retailing in Europe taking into account some relevant analytic constraints: different and often conflicting theoretical points of view, shortage of routinely collected data, problems in isolating the impact of single reforms in power sector and pervasive regulatory interventions. Theoretical approaches and empirical studies are discussed with the goal of testing the consistency of theory and practice. Our analysis suggests that direct benefits of retail competition have been often overstated, particularly for small and residential customers. Final market has proven to be less dynamic than forecast and new entry in supply more difficult to sustain in the medium-long run. Regulatory requirements are demonstrated to be more significant than suggested in previous papers, due to non-negligible market imperfections. Our main conclusion is that it seems unlikely that “light-handed regulation” may fully substitute for “hard regulation” in this sector, especially for small and residential customers. Moreover, direct regulatory interventions remain essential for arranging and managing Default and Last Resort services and avoiding the risk of excluding “vulnerable customers” from trade. In the light of this limitations, further actions appear to be required to give a thorough organization to this business able to let expected outcomes of other related reforms (e.g. liberalization of generation) a stronger impact on final customers’ welfare.

1 Introduction

In any industry the role of retailers is to provide final customers with added-value services. The types and magnitudes of the costs and benefits of retailing adding-value activities vary widely across sectors, final customer dimensions and characteristics, periods, geographical locations and market structures.¹ In the electricity industry, retailers perform two main activities: on the one hand, they provide final customers a complex service by aggregating inputs from all upstream actors (generation, transport and distribution); on the other hand, they facilitate upstream firms' sales by finding, arranging and managing relationships with potential and actual buyers.

In the liberalization process of power sector, retailing and generation have been opened to competition, whereas grid operation, maintenance and investments have remained under regulatory oversight. In Europe the opening of retail electricity markets has progressively entitled *eligible customers* to freely purchase retail services from a supplier of their choice: this right was first awarded to industrial consumers with annual consumption above a certain threshold² and then to all non-household consumers from the 1st of July, 2004, followed by all consumers since the 1st of July, 2007. At present, almost all European countries have formally achieved the objective of a fully open retail market.³

Before and during the process of liberalization several arguments have been put forth on the costs and benefits of retail electricity competition. Despite the non-negligible academic and political interest on this topic, there has never been a consensus on the theoretical framework that should be used to examine retail activities in this type of market. The lack of a shared vision has challenged the definition of a common set of indicators for assessing the success or the failure of the reform. Two additional limitations have discouraged empirical impact analyses: on the one hand, the scarcity of data on European retail markets which *de facto* impedes a systematic market oversight; on the other hand, the difficulty of disentangling the effects of retail liberalization from those of other related reform (e.g. liberalization of generation) when using available data, such as final prices. On top of that, the powerful regulatory interventions in this business compound the evaluation of retail competition. Indeed, liberalization goals of improving efficiency and effectiveness in electricity retailing have been frequently counterbalanced, both at European and at national level, by the political requirement of ensuring that no consumers were excluded from trade. This objective has often been translated in the co-existence of market prices and regulated tariffs, the latter being kept artificially low with a clear impact on competition's dynamics.

The aim of this article is to provide a mid-term evaluation of liberalization of electricity retailing in Europe taking into account the mentioned analytic constraints: different and often conflicting theoretical points of view, shortage of routinely collected data, problems in isolating the impact of each reform, pervasive regulatory interventions. The objective is twofold: drawing the attention to a relevant topic which has been overlooked in recent debates on power markets and suggesting a set of actions that should be undertaken by policy makers in order to give electricity retail business a definitive and transparent status. In doing so we essentially answer to the dilemma: coming back or going forth with liberalization of electricity retailing?

¹Retailing activities add-value optimizing consumers' allocations of time; increasing consumer awareness of product features, price and quality; offering customer assistance; reducing searching, switching, transportation, transaction and stock-out costs (Joskow, 2000).

²See Directive 96/92/EC.

³By 2009, Cyprus, Estonia (which was, however, subject to a transitional regime) and Hungary had yet to achieve the goal of completely open retail markets (EC, 2011).

Our analysis suggest that direct benefits of retail competition have been often overstated, particularly for small and residential customers. Final market has proven to be less dynamic than forecast and new entry in supply more difficult to sustain in the medium-long run, notably for small, non integrated companies. The disappearance of captive market seems to have benefited more integrated generators willing to sell their power to newly attracted customers than pure retailers competing on a retail margin. At the same time European regulators seem to have proceeded without truly questioning liberalization paradigm, even when some shortcomings have revealed. They lacked both the courage to let the market freely work and the strength to take a step back when it did not [espandere con elementi fattuali delle ultime sezioni]. Our main conclusion is that it seems unlikely that “light-handed regulation” may fully substitute for “hard regulation”⁴ in this sector, especially for small and residential customers. In the light of this limitation, further actions appear to be required to give a thorough organization to this business able to let expected outcomes of other related reforms (e.g. liberalization of generation) a stronger impact on final customers’ welfare.

The discussion is organized as follows. In the next section we summarize the theory on competition in electricity retailing. In the third section we provide an overview of European retail electricity markets, using the few available data to test some of the theoretical predictions. The fourth section is dedicated to the analysis of market characteristics which may undermine the development of a sound retail competition. In the fifth section we analyse Default and Last Resort services and the implementation of protection mechanisms for “vulnerable customers”. The final section contains the discussion of results and suggests the next steps that may be taken to improve reform’s outcomes.

2 Retail electricity competition

The expected impacts of competition on electricity retailing are summarized in Table 1. Some of the benefits concern efficiency gains, while others are more related to the aspect of differentiation; the remaining benefits are associated with equipment innovation.

Dimension	Expected impact
Efficiency	Direct gains on retail services
	Indirect gains on wholesale, transport and distribution services
	Systemic gains (elimination of double marginalization effect)
Differentiation	New offers and contractual arrangements
	Wider range of services (risk-hedging services, energy management)
Equipment innovation	Innovative measuring and reading devices
	Empowered equipment for quality services

Table 1: Expected impacts of retail electricity competition

⁴By “light-handed regulation”, we mean market monitoring and ex-post enforcement, while by “hard regulation”, we mean ex-ante regulatory interventions.

The academic debate on retail competition has generally been of a qualitative nature⁵ although there have been some econometric attempts aimed at examining consumer behaviour and at measuring the impact of retail competition on final prices.

2.1 Efficiency

Increasing competitive pressure on electricity retailers is likely to improve the efficiency of retailing. Direct efficiency gains have two main sources: increased use of cost-based pricing⁶ and a more efficient organization of retailing activities. Using 1996 data, Joskow (2000) estimates the potential savings for the average customer in United States from switching to a competitive retailer that is responsible for all retailing services⁷ and is able to provide them at a 25% discount compared to distributors. He finds that the average customer's bill might be reduced by less than 1% or approximately 2 dollars per month if the competitive retailer were to pass all of its cost savings through to the customer.

In the same vein Ofgem, the British energy regulator, roughly calculates for different payment methods⁸ the retail margin on which the entrants are supposed to undercut incumbents (2004). Littlechild (2005) provides a downward revision of Ofgem's estimates, mainly reflecting larger than forecast costs for credit cover and initial IT and billing system settlement. The author concludes that the retail margin may be positive only for direct debit contract, regardless the size of the entrant, while is negative (small firms) or zero (large and medium sized firms) for standard credit contracts. Finally, prepayment contracts may entail negative margins for all types of new entrants. These estimates support Joskow's opinion on the limited room for gains coming from more efficient retail activities to be passed-through to final customers.

However, according to Littlechild (2000) efficiency gains may be more significant because they may not only originate from direct retail operations but also from upstream procurement,⁹ which is estimated to account for approximately 50% of the final retail price. Fierce competition for end customers may also place downward pressure on transmission and distribution costs. Finally, from Littlechild's perspective, over time, market forces are able to reintroduce the proper incentives for dynamic efficiency: with competition, only the best offers from the efficient suppliers can survive and expand at the expense of unwanted contracts or/and inefficient sellers.

A last source of efficiency, which we may call systemic, has been envisioned in the elimination of the double marginalization effect (Goulding et al., 1999). This effect arises as a consequence of the vertical unbundling of supply activities along the value chain when firms in different segments retain some degree of market power. Economic theory states that when vertical relations do not exist, firms can exercise their market power at all successive stages of the value chain, generating a negative

⁵The contributions of Borenstein and Holland (2005) and Joskow and Tirole (2006) are, to the best of our knowledge, the only attempts to formalize models of retail electricity competition. In these papers, the authors estimate the price distortions arising when competitive retailers are active and settlement obligations for wholesale power purchases are determined on the basis of load profiles when final customers do not react to real time prices. For models of retail competition in the gas industry, see for instance Cremer et al. (2006) and Polo and Scarpa (2011).

⁶Real time pricing is one of the possibilities.

⁷It should be noted that, even after full unbundling, distributors will continue to be responsible for, and thus will bear the costs of, some retailing services such as requests to connect, disconnect, or change the level of service, resolve outages and power quality problems, and interface with competitive retailers (Joskow, 2000).

⁸Standard credit, direct debit and prepayment.

⁹Littlechild (2000) provides some quantitative estimations of this effect in the United Kingdom, while recognizing the inherent difficulty of such an exercise.

impact on aggregate firm profits and on consumer welfare.¹⁰ From this perspective, retail competition *per se* is perceived to be a positive element of liberalization reforms: with retail competition, the double (retail) margin is eliminated or at least reduced.¹¹

For the supporters of full retail competition, in principle efficiency gains may be passed through to customers in the form of lower final prices. Some authors have attempted to estimate the impact of reforms such as privatization and liberalization on final prices and efficiency. See for instance Newbery and Pollitt (1997) on British data, Steiner (2001) and Hattori and Tsutsui (2004) on OECD Countries¹² and Joskow (2006) on US data. Joskow's paper is the only one that properly accounts for retail competition. The author compares changes in real electricity prices between 1996 and 2004 for US states that introduced retail competition and for those that have not. He finds evidence that households in the states where the reform was adopted benefited from larger reductions in prices (with the exception of Texas), while this trend is not apparent for industrial customers. However, this result cannot be attributed *tout court* to retail competition, as in the same period, several other reforms were implemented in the electricity sector (increased competition in generation, improvements in the regulation of distribution and transmission services, etc.).

On the downside, several authors agree that opening the market is likely to produce larger advertising, promotional, transactional, and system duplication (e.g. billing or customer assistance) costs, while there is no consensus on the final balance between these costs and the benefits of competition.¹³ For instance, Littlechild (2000) finds that in the long term, efficiency gains may offset increased advertising and promotional costs, whereas Joskow (2000) and Defeuilley (2009) are more skeptical of this prediction.

2.2 Differentiation and equipment innovation

Theoretically speaking, retail competition is expected to bring new offers and contractual arrangements to the market and broaden the range of available services, such as risk-hedging or energy management. Furthermore, competitive pressures on retailers may indirectly force other actors, such as distributors or equipment providers, to develop and install new measuring and reading devices and the equipment necessary to improve service quality.

According to Joskow (2000) and Defeuilley (2009), the potential for product differentiation and developments in the range of value-added services for which small and residential customers are willing to pay an additional fee appears constrained in the electricity industry. Empirical evidence in Europe partly contradicts this pes-

¹⁰The double marginalization problem may also be overcome by reestablishing vertical contractual relationships between actors (with some sided-effects) or by using special types of contracts, e.g., two-part tariffs (Motta, 2004).

¹¹An empirical paper by von Der Fehr and Hansen (2010) reveals that when fierce competition has been introduced in Norwegian retail electricity market, firms has begun to behave as in a standard Bertrand setting, which has ensured cost-reflective pricing, even in the presence of a small number of competitors.

¹²The first paper presents a social cost-benefit analysis, while the others perform regressions using panel data. Both approaches present specific limitations: cost-benefit analyses require the assessment of a credible counterfactual; in the regressions, endogeneity issues are likely to arise.

¹³Advertising and marketing are useful tools for spreading information about products, prices and competitors. However, a general mistrust toward electricity retailers, energy brokers and their advertising campaigns endures, undermining the engagement of consumers and the gains from communication (OFGEM, 2012b). Consumer attitude has been sometimes exacerbated by misleading advertising campaigns which have been fined worldwide by competition authorities (see for instance the cases of ENI in Italy and Airtricity in Ireland).

simistic view on limited scope for product differentiation.¹⁴ Even though additional services such as energy management were primarily demanded by larger customers, competition in electricity retailing also stimulates the demand for new types of products (mainly with green and dual fuel options) and innovative contractual arrangements for pricing (wholesale price plus mark-up contracts, fixed-price contracts, standard variable contracts, time-of-use contracts, and flat contracts) among small and residential customers. The diffusion of these products remains nonetheless heterogeneous.¹⁵

The installation of smart metering and reading devices seems to represent an essential condition for extending the range of products and services offered by electricity retailers as well as for enabling an active demand side participation. Intelligent equipments may foster the development of contracts with dynamic pricing options and the adoption of more efficient consumption behaviours; moreover they may simplify the process of billing and information exchange between retailers and distributors, with a positive impact on competition dynamics.¹⁶ Even so the adoption of this new technology seems to have been prompted more by binding legal framework than by competitive forces.

Indeed it is the European Directive 2009/72/EC which has established that 80% of total consumers should have been equipped with an intelligent metering system by 2020. The decision to roll-out smart metering systems has been subject to a preliminary economic assessment at national level, which has resulted in a variety of coverage choices, technical designs and implementation schedules (EREG, 2013). At present only Italy and Sweden have completed their roll-out with a 95% and 100% coverage respectively¹⁷ while Belgium, Czech Republic, Portugal and Lithuania have decided not to invest at all in smart meter deployment. This situation highlights the lack of agreement on the final balance between costs and benefits of smart meter adoption especially in the case of small and residential customers (on this debate see for instance Léautier, 2013).

3 Retail markets in Europe

A set of economic indicators may be used to test some of the theoretical predictions regarding the outcomes of liberalized electricity retailing. We focus on the European Union because all Member States have adopted a common legal framework to open both the wholesale and retail markets to competition. Therefore, if there are country-specific aspects of retail competition, they reflect different realities in terms of the generation mix, political and strategic objectives, and consumers' attitudes and awareness vis-à-vis the market.

3.1 The supply side

On the supply side, liberalization reforms have allowed new firms to enter the market. After a substantial amount of market entry in the first phase of liberalization, over the whole 2003-2011 period, the total number of electricity retailers decreased from

¹⁴The analysis of the relationship between the numbers and types of available contracts and the ability of consumers to seize the better market opportunities by switching supplier is postponed to section 4.2.

¹⁵For a survey of newly introduced products, see for instance Von der Fehr and Hansen (2010) on the Norwegian market and Littlechild (2002) on British market.

¹⁶Littlechild (2005) discusses in details the importance of metering and data communication in the process of entry.

¹⁷In both cases the distributor is in charge for the roll-out and the investment is financed through regulated tariffs.

about 3379 to about 3242 (see Figure 3 in the Appendix). However, nearly half of European countries have benefited from the opposite trend. The number of retailers has slightly increased from 2010 to 2011.

In 2010, the figures for the main retailers, i.e. those accounting for at least 5% of total national electricity consumption, reveal that only one country, Romania, has eight big players, while the most numerous group of countries is characterized by the presence of three main retailers.¹⁸ Detailed data are reported in Figure 4 in the Appendix. These figures seem to indicate that the retail market has an oligopolistic structure rather than a competitive one.¹⁹ From 2003 to 2010 the total number of main retailers remained relatively constant, from about 102 companies in 2003 to 101 companies in 2010 (see Figures 5 and 6 in the Appendix).

Another relevant indicator of market structure is provided by the cumulative market share of the main retailing companies. The difference between the total market and the cumulative market share of the main retailers indicates the size of the residual market, or the market available to minor competitors. The cumulative market share of the main retailers in 2010 is reported in Figure 1.²⁰



Figure 1: Cumulative market share of retailers (%), 2010.

Source: Authors' elaboration on Eurostat data.

According to the size of the residual market, European countries can be classified into three groups:

- Countries where the market covered by minor retail companies is large, i.e., between 45% and 65% of the total market: Germany (62.4%), Norway (52.2%), Sweden (52.1%) and Italy (45%);
- Countries where smaller retailers cover between 35% and 20% of the total market: Romania (33.2 %), Poland (29.7 %), Estonia (27%), Spain (27.4%), Netherlands (25%) and Hungary (22%);
- Countries characterized by a very narrow residual market: the more striking cases are Ireland and Portugal (3%), Slovenia (1%) and Latvia (0.1%).

¹⁸The relevant market for retailers is the national market.

¹⁹Recall that in an oligopoly where firms compete à la Bertrand, the presence of two firms is sufficient to restore the market outcome of perfect competition.

²⁰Denmark is excluded because of missing data; Finland does not report the information on the cumulative market share of main retailers; in Netherlands only main retailers selling electricity to small consumers are considered.

Because the market for “minor competitors” is below 20% in 15 out of 26 of the countries considered, the retailing industry in European countries can still be assessed as highly concentrated. It is not possible to discern a clear trend in the cumulative market share of main retailers between 2008 and 2010: the value of this indicator has grown in 8 of the 26 countries, while it has remained unchanged in 4 countries. The data are reported in Figure 7 in the Appendix.

The reduction in the total number of retailers has been justified in some cases by unsuccessful entry attempts and in others by horizontal consolidations or acquisitions of small retailers by larger and often vertically integrated firms.²¹

3.2 The demand side

On the demand side, the switching rate of final customers is a commonly used indicator for the level of buyer commitment in a market: it calculates the number of end users who decide to change suppliers when retail services are liberalized. The main idea conveyed by this indicator is that if consumers can easily change service providers when they wish to, producers are less prone to engage in exploitative behaviors, such as imposing high final prices or low quality, and hence the market may be considered more competitive.

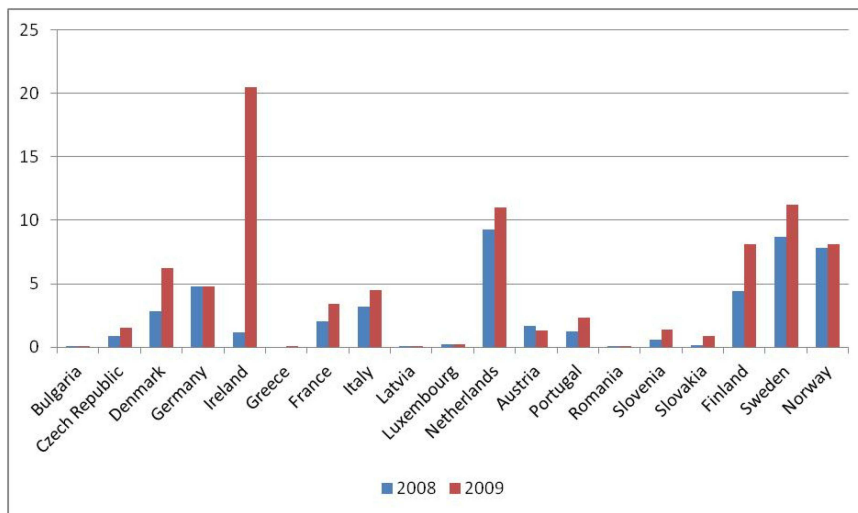


Figure 2: Annual switching rate in the total retail market (%), 2008/2009.
Source: Authors' elaboration on European Commission data.

Figure 2²² indicates that Ireland and the Nordic Countries represent the most active European electricity markets. Only Ireland, Sweden and the Netherlands had switching rates above 10% during the period 2008/2009, while Finland, Norway and Denmark reached the 5% threshold. France, Germany and Italy are next, with the remaining European countries reporting switching rates close to zero. However, apart

²¹This trend suggests the presence of economies between retail and generation activities that would favor the integration of upstream and downstream businesses (Pollitt, 2008). If owning a retail firm has the potential to increase generators' investments by constraining overall business risk, the reduction in the number of actors would lead to a higher level of concentration that may increase the retail margin (Jamassb and Pollitt, 2005).

²²Belgium, Estonia, Great Britain, Hungary, Poland and Spain are excluded because of missing data; Cyprus, Lithuania and Malta registered zero switchings.

from Austria, all countries exhibit a positive trend in the indicator over the considered period.

The figures change if end users are classified into three categories according to their consumption volume: large consumers, medium-sized industries, small industries and households.²³ Large consumers have generally exhibited proactive behavior, with 2009 switching rates ranging from 3,3% in Luxembourg to 73% in the Czech Republic. Moreover, the percentage of meter points switching suppliers increased between 2008 and 2009 in all European countries except Austria, Germany, Italy and Luxembourg. Similar figures are reported for medium-sized industries, with relatively small magnitude. In this case, the 2009 indicator ranges from 0,008% in Bulgaria to 39% in Ireland. From 2008 to 2009, a positive overall trend is observable, with the only exception being Austria. The participation of small industries and households in the market has been substantially lower in almost all countries considered, with the switching rate only exceeding the 10% threshold in Ireland (2009) and Italy (in 2008 and 2009). The trend in the indicator for this group of consumers is positive overall, with the exception of a few countries.

Four considerations are noteworthy. First, there is no consensus on the level of the switching rate at which the market can be considered “sufficiently competitive”. Littlechild (2009) considers a residential customer switching rate of 10% a sufficient threshold to justify the liberalization of retailing. To the best of our knowledge, this is the only author providing a basis for comparison with real data. Second, the switching rate registers the number of customers who have changed retailers, but does not account for the number of customers who have chosen another contract offered by their current supplier. This number also represents an indicator for customer awareness that is not accounted for in official figures. Third, the difference in switching rates between residential and large customers seems to indicate the presence of market imperfections, and we address this issue in detail in the next section.

The most recent publicly available public figures, from 2009, reveal that 10 of the 28 countries have opted for the complete removal of end-user price regulation, while a few countries have only done so for non-residential consumers. Where tariffs are available, a large share of final customers, both households and firms, continue to purchase electricity under regulated conditions (EC, 2011). While it is true that regulation and competition are two sides of the same coin, there is still no general consensus regarding the necessity of eliminating end-user price regulations to allow the retail market to operate effectively.

4 Competition with market imperfections

Some authors claim that the presence of market imperfections, such as switching costs, informational complexity and a “consumer preference not to choose”, may affect the outcomes of competition in the electricity sector, at least regarding small and residential customers (Joskow, 2000; Brennan, 2006; Defeuilley, 2009). In addition, the specific characteristics of electricity retail seem to undermine the expected benefits of competition by generating negative externalities, such as customer’s segmentation and innovation’s slowdown (Defeuilley, 2009).

In the following paragraphs, we present a summary of the main findings regarding these issues. Some of these imperfections, such as informational complexities, seem to require the implementation of some forms of “hard regulation”. From this perspective, the “light-handed regulation” common in other liberalized industries does not seem

²³Switching data by end user category are reported in the Appendix (Figures 8 to 10).

to be sufficient to ensure the proper operation of retail electricity markets.

4.1 Switching costs

Theoretically speaking, in markets characterized by repeated interactions between buyers and sellers, a consumer who has previously purchased a product from a supplier may incur costs when switching to a competitor, despite the firms' products being identical (Klemperer, 1995). Switching costs arise for the following reasons:

- searching costs to identify offers and the suppliers;
- learning costs to become familiar with the supplier;
- transactional costs to sign and resolve a contract.

Switching costs may be real or perceived and lead to a situation in which “*products that are ex ante homogenous become, after the purchase of one of them, ex post heterogeneous*” (Klemperer, 1995). These costs prevent customers from changing suppliers even if they are offered a better priced deal and thus have the same effects on market dynamics as a barrier to entry. In the electricity industry, where consumers have long-lasting supply relationships with the incumbent, switching costs may deter complete consumer mobility, leading to under-switching despite the presence of substantial savings (Defeuilley, 2009). Moreover, the situation may be exacerbated if the switching process is delayed or blocked by suppliers without specific reasons²⁴.

Giulietti et al. (2010) analyze the influence of searching and switching costs in the UK retail electricity market by studying the trend in price convergence between new entrants and the incumbent. The authors find that, in line with the general predictions of competition models with switching costs, even after the entry of new competitors, incumbents are able to enjoy a consistent price advantage. Moreover, new entrants, as soon as they are established in the market, tend to exploit the presence of consumer searching and switching costs: over time, new firms' incentives to offer lower prices to gain additional customers are more than offset by the benefits of keeping prices high to increase margins on previously served customers.

4.2 Informational complexities

In some sectors, consumers may also be unwilling to change suppliers because they face relevant difficulties in evaluating and comparing suppliers' offers. This might be the case in the electricity industry, where consumers are generally offered two- or multi-part tariffs, which reduce their ability to estimate the per-unit price of the product. This situation might be further complicated if supply contracts contain other advantages that cannot be straightforwardly translated into electricity price savings (e.g., discounts on other purchases). This limitation may imply the following:

- consumers switch to a more expensive supplier (over-switching);
- consumers switch to a cheaper but not the cheapest available supplier (inaccurate switching).

Errors in consumers' switching decisions damage their welfare both directly, as they cannot obtain the maximum surplus provided by existing retailers, and indirectly, by increasing retailers' market power due to a weakened relationship between firms' sales and surplus provision.

²⁴Compare for instance Ofgem (2012a).

Empirical evidence on electricity sector is provided in Wilson and Waddam-Price (2005). The authors employ a sample of more than three thousand face-to-face surveys of UK households, 13% of which has switched suppliers.²⁵ They find that nearly 30% of households switched to a more expensive supplier, while inaccurate switching led customers to only obtain one fourth of the gains available on the market. The paper suggests that information overload and complexity may cause switching decisions to be less efficient when the numbers of retailers and options in the market are large. As a consequence, while increasing the number of competitors may have a positive effect on the total gains available on the market, informational complexity may limit the ability of consumers to exploit such gains, with a net negative impact of competition on equilibrium final prices.

Recently, OFGEM (2012a), the British Regulator, published a package of proposals designed to eliminate, or at least reduce, informational complexities that constrain households' participation in electricity markets. The proposals include a limitation on the number of tariffs that suppliers can offer and the types of tariffs (only two part-tariffs are allowed), and impose specific layouts and contents for communications from suppliers to consumers.

4.3 Consumer preference not to choose

In open opposition to the assumptions of the standard economic model, Brennan (2006) attributes the likely scarce success of competition in retail electricity market to the consumer preference for not making a choice, which can be considered a type of market failure. While liberalized markets have forced consumers to make informed choices that in turn presuppose increasing efforts at understanding and comparing contract conditions and terms of trade, the experience in electricity, and previously in telecommunication markets, seems to suggest that consumers in these sectors do not always consider having additional options from which to choose an advantage. Brennan's opinion stems from an accurate analysis of the marketing literature which indicates that consumers generally exhibit a limited propensity to revise their choices or change the goods and services in their consumption bundles.

4.4 Customers' segmentation

Some authors note that a possible side-effect of introducing competition in the retail electricity market is the segmentation of active and passive customers (Defeuilley, 2009; von der Fehr and Hansen, 2010). Consumers are active in a market when they exercise their freedom of choice by switching suppliers or by renegotiating their contractual conditions without changing retailer. Differences in customers' willingness to switch suppliers or renegotiate contractual arrangements may create the potential for a two-tiered retail market. In this case, active consumers who are consistently involved in market dynamics may benefit from the introduction of competition in retailing because they can obtain access to deals with prices that tend to be more cost-reflective. The inactive customers, conversely, may end up paying prices that are above their pre-liberalization levels, as firms may exploit consumers' reluctance or inability to switch to cross-subsidize their entry to the competitive sub-markets. Empirical evidence from the Norwegian and United Kingdom markets seems to confirm this prediction (OFGEM, 2007; OFGEM 2012b; Von der Fehr and Hansen, 2010).

²⁵While the percentage of switching customers is in line with the national figure, the sample is biased toward low-income customers.

4.5 Innovative processes

According to Defeuilley (2009), some structural characteristics of the electricity industry may limit the opportunities for new entrants, which are supposed to offer price reductions or quality improvements. The author suggests that a more careful analysis of electricity provision reveals that scientific and technological opportunities for new entrants in this retail sector are limited. Actually, investments in innovation seem to be characterized by high levels of appropriability and cumulateness at the firm level. This implies that the innovative processes in this sector are likely driven by large established firms, rather than by new entrants. Moreover, possibilities for innovation in electricity retailing seems to be triggered more by equipment innovations (installation of more sophisticated devices) or upstream choices (investments in renewable energy sources) that are generally independent of competition in retailing, rather than by radical innovations in business management (new information technologies, improved customer management, etc.).

5 Regulation in competitive retail markets

In the previous section, we asserted that some direct regulatory interventions are necessary to overcome the market imperfections in electricity retailing. Here, we argue that the need for regulation does not disappear, even after achieving full competition. Three situations are relevant here.

First, when competition is introduced in a market, customers can decide to switch to a new supplier or can be passive and do nothing. In the latter case, the continuity of supply can be ensured by assigning passive customers to a so called Default Supplier (DS).²⁶ As competition expands and more consumers participate in the market, demand for the Default service should fall and nearly disappear in the long run. Second, customers served by a competitive retailer may face the risk of being interrupted if the supplier becomes unable to provide the service, for instance because it is insolvent or bankrupt. In this case, regulators must arrange for the transition of customers to a temporary supplier, the so called Last Resort Supplier (LRS), which ensures service continuity. There may be a third group of customers, often called “vulnerable”, that struggles to obtain a counterparty in the market, notably because these customers are not profitable. The lack of profitability may depend on customers’ social and economic backgrounds or on the costliness of supply. In the transition to competitive retail markets, these customers face a serious risk of exclusion.

Each situation calls for a specific intervention. In the first two cases, the need to provide an uninterrupted service may be counterbalanced by the objective of ensuring a certain level of customer protection, especially in terms of price. A wide array of implementation patterns are feasible, according to the relative weight placed on these objectives and considering several possible providers (Table 2). In addition, three procedures are available to assign these services to a retailer:

1. a direct “ex ante” entitlement, typically granted to the incumbent firm;
2. a random entitlement among the competitive suppliers;
3. a bidding process based on the competitive selection of the provider²⁷.

²⁶An alternative is the immediate disconnection of passive customers, but we do not consider this hypothesis politically feasible.

²⁷An empirical application of this measure can be found in Italy, where non-residential customers

Responsible subject	Price for electricity	Price formation	Focus
Transmission system operator	Imbalance payment	Real time	Supply continuity
Local distributor	Regulated tariff or price cap	Historic (cost)	Consumer protection
	Freely set price	Real time	Supply continuity
Retailer	All retailers (or only the incumbent) offer a tariff	Historic (cost)	Consumer protection
	Supplier resulting from auction	Real time	Supply continuity

Table 2: Patterns for the organization of Default and Last Resort services

For instance, when ensuring the continuity of supply is the only regulatory goal, network system operator may provide Default and Last Resort services as part of its balancing activity. Price formation occurs in real time: the consumers pay an imbalance payment, which is generally burdensome, to discourage imbalances from the day-ahead production plan. Conversely, if a regulator wishes to guarantee a high level of customer protection, Default and Last Resort services may be offered at a tariff and provided by a retailer or the local distributor.²⁸ Note that each solution presents specific advantages and drawbacks in terms of market distortions, political sustainability, required regulatory oversight and enforcement.

The problem of “vulnerable” customers is slightly different and may be better understood within the Universal Service Obligations (USOs) framework. The primary argument in favor of USOs has been a concern for full market coverage at reasonable prices, including more costly market segments such as rural areas. Accordingly, some obligations have been imposed on network service providers in the form of restrictions on price discrimination (“non-discrimination” constraint) or obligations to provide the service regardless a customer’s geographical location (“ubiquity” constraint). Often, the two constraints have been combined, asking the firms to ensure full market coverage at a uniform price. Prior to liberalization, vertically integrated monopolies were able to finance USOs by cross-subsidizing unprofitable and profitable market segments in their customer portfolio.

From a theoretical perspective, when competition is introduced in markets with profitable and unprofitable end users, new entrants only compete with the incumbent for profitable customers, generating the so-called “cream skimming” phenomenon, which challenges the incumbent’s ability to finance USOs through cross-subsidies (Laffont and Tirole, 2000). Several authors (see for instance Anton et al., 2002; Choné et al., 2000; Choné et al. 2002; Mirabel and Poudou, 2004) have attempted to assess the welfare effects and distortionary impacts of different regulatory instruments that governments may implement to allocate and finance USOs. However, none of

who temporarily lack a retailer can benefit from a “safeguard service”, the supply of which is assigned for a period of two years to the winner of a reverse auction, where the participants offer to provide the service at a mark up with respect to the wholesale price of electricity.

²⁸When Default and Last resort services are offered at a tariff, they generate two distortions: the first is to provide customers with inaccurate price signals for their withdrawals; the second is that the tariff becomes the reference price for market contracts, i.e., the so called “*price-to-beat*”.

these papers question the economic rationale behind keeping USOs in liberalized markets. In particular, while the “ubiquity” constraint may continue to be imposed on regulated network operators, “non-discrimination” constraint is at odds with the concept of competitive markets with efficient cost-reflective prices.

Panzar (2000) stresses that there is an unavoidable trade-off between competition and universal service provision in liberalized markets. If there is a need for a universal service policy, this means that the competitive market cannot deliver socially acceptable allocations without direct public intervention. We argue that the need for USOs exists if the transition to competitive retail markets may exclude “vulnerable” or unprofitable customers from the trade of an essential good such as electricity. However, in line with ERGEG (2007), we suggest that to avoid the risk of exclusion more targeted and less distortionary interventions are preferable, such as social tariffs²⁹ or direct transfers to customers.

5.1 Default Supplier, Last Resort Supplier and Universal Service Obligations in Europe

In Europe, the application of DS and LRS regulations is highly heterogeneous. The term Default Supplier does not appear in the European Directives, and ERGEG (2009) reports that most European Countries (11 over 27) do not use this term in their national regulations. When this term is employed, it generally refers to the provider serving passive and “vulnerable” customers. Conversely, the Supplier of Last Resort is explicitly mentioned in European Directives as the provider of Universal Service. The majority of European Countries (20 out of 27) use this label to indicate the provider serving customers whose retailer exited the market and “vulnerable” customers. It is very common that the two terms are employed synonymously and that a unique supplier is designated to ensure the continuity of supply in each of the three cases examined above. When national regulations do not employ these labels, other forms of interventions are designed to overcome the three possible situations where a retailer is absent. DS and LRS are generally selected by the regulator: the incumbent is generally the DS, while in the half of the countries it also performs the role of LRS. The length of Default service provision is not temporarily limited in most countries, and this fact may partly reduce customer awareness.

Universal Service provision is explicitly recognized in European Directives³⁰ and its implementation frequently coincides with end-user price regulation for small and residential customers.³¹ In principle, the justification for end-price regulation seems to rely on the need to reduce the exploitation of final customers resulting from retailers’ market power after the introduction of competition (Littlechild, 2000; OFGEM, 2002; ERGEG, 2007). This interpretation requires the withdrawal of pricing restrictions after the passage of the amount of time required to increase customer awareness and

²⁹For instance, the duty of serving customers through social tariffs may be allocated to the local distributor, to all retailers or to the incumbent.

³⁰The Directive 2009/72/EC states, “*Member States shall ensure that all household customers, and, where Member States deem it appropriate, small enterprises, enjoy universal service, that is the right to be supplied with electricity of a specified quality within their territory at reasonable, easily and clearly comparable, transparent and non-discriminatory prices. To ensure the provision of universal service, Member States may appoint a supplier of last resort*”.

³¹The French government, for instance, in 2010 passed the NOME law, which prescribes the complete removal of tariffs for industrial customers beginning in June 2011 and allows residential customers to choose between signing contracts at market prices or being supplied by the incumbent firm, EDF, at regulated tariffs through to 2015, when all end-user regulated tariffs will disappear. The law also entitles competitive retailers to withdraw a share of EDF nuclear generation at a regulated price to supply final consumers. For further details see Creti et al. (2013).

to stimulate the entry of retailers.

Nevertheless, there is no consensus regarding the necessity to withdraw electricity tariffs to allow the market to operate effectively. For instance, Vásquez et al. (2006) maintain that a permanent, well-calculated tariff including a shopping credit³² achieves the objective of guaranteeing the supply to all customers without deterring consumer switching. Other authors such as Joskow (2000) and Littlechild (2000) are more skeptical of the benefits of including a shopping credit in regulated tariffs. It is likely, however, that consumers may be deterred from switching and new entry may be hampered if tariffs do not reflect the underlying costs (Joskow 2006; EC, 2007).

6 Discussion and conclusions

We proposed a comprehensive analysis of liberalization in electricity retailing using the European Union as case study. Despite several attempts to analyze retail market dynamics, there is still a lack of consensus on the type of theoretical framework that should be used to study competition in this segment. We fill this gap by highlighting the main economic dimensions on which competition is expected to have a relevant impact.

The estimation of competition effects over small firms and households represents the most controversial point in the academic debate. The presence of market imperfections, such as switching costs or informational complexities, seems to limit the possibilities for end users to fully engage in the market. As a consequence, the segmentation of active and passive customers may occur, thereby hampering the process of developing effective competition. To overcome these limitations, we argue that some forms of “hard” regulation may still be required.

Furthermore, we show that the introduction of competition in electricity retailing requires ex-ante regulation of Default and Last Resort services. We present a complete array of implementation models and discuss their advantages and drawbacks. Finally, we assess the case for Universal Service in competitive retail markets and suggest less distortionary interventions to avoid the risk of customer exclusion.

The data and the figures on European Union have revealed that the transition to a completely competitive retail market remain an ongoing process. Although new firms are active in the market, the supply is still highly concentrated in the hands of a few large operators. Relatively low switching rates for small firms and residential customers demonstrate the limited engagement by this group of end users. From a policy perspective, our analysis suggests that further steps should be taken and that we are far from eliminating direct regulation in this sector.

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³²A shopping credit is an extra charge over the regulated tariff that creates a retail margin over which new entrants can compete.

References

- [1] Anton, J.J., Vander Weide, J.H. and Vettas, N., 2002, "Entry auctions and strategic behavior under cross-market price constraints", *International Journal of Industrial Organization*, 20 (5), 611-629.
- [2] Borenstein, S. and Holland, S., 2005, "On the efficiency of competitive electricity markets with time-invariant retail prices", *Rand Journal of Economics*, 36(39), 469-493.
- [3] Brennan, T., 2006, "Consumer preference not to choose: methodological and policy implications", *Energy Policy*, 35 (3), 1616-1627.
- [4] Bushnell, B., Mansur, E. and Saravia, C., 2008, "Vertical arrangements, market structure and competition: an analysis of restructured U.S. electricity markets", *American Economic Review*, 98 (1), 237-266.
- [5] Choné, P., Flochel, L. and Perrot, A., 2000, "Universal Service Obligations and Competition", *Information Economics and Policy*, 12 (3), 249-259.
- [6] Choné, P., Flochel, L. and Perrot, A., 2002, "Allocating and funding universal service obligations in a competitive market", *International Journal of Industrial Organization*, 20 (9), 1247-1276.
- [7] Creti, A., Pouyet, J. and Sanin, M-E., 2013, "The law NOME: some implications for the French electricity markets", *Journal of Regulatory Economics*, 43 (2), 196-213.
- [8] Defeuilley, C., 2009, "Retail competition in electricity markets", *Energy Policy*, 37 (2), 377-386.
- [9] European Commission, 2007, "Inquiry pursuant to Article 17 of Regulation (EC) No 1/2003 into the European gas and electricity sectors", Brussels.
- [10] European Commission, 2011, "2009-2010 Report on progress in creating the internal gas and electricity market", Brussels.
- [11] European Regulators' Group for Electricity and Gas, 2007, "End-user energy price regulation: an ERGEG position paper", E07-CPR-10-03, Brussels.
- [12] European Regulators' Group for Electricity and Gas, 2009, "Status review of the definitions of vulnerable customer, default supplier and supplier of last resort", Brussels.
- [13] Giuliotti, M., Otero, J. and Waterson, M., 2010, "Pricing behaviour under competition in the UK electricity supply industry", *Oxford Economic Papers*, 62 (3), 478-503.
- [14] Goulding A.J., Rufin, C. and Swinand, G., 1999, "The role of vibrant retail electricity markets in assuring that wholesale power markets operate effectively", *The Electricity Journal*, 12 (10), 61-73.
- [15] Hattori, T. and Tsutsui, M., 2004, "Economic impact of regulatory reforms in the electricity supply industry: a panel data analysis for OECD countries", *Energy Policy*, 32 (6), 823-832.
- [16] Jamasb, T. and Pollitt, M., 2005, "Electricity market reform in the European Union: review of progress toward liberalization and integration", *The Energy Journal*, 26 (Special Issue), 11-41.
- [17] Joskow, P.L., 2000, "Why do we need electricity retailers? or can you get it cheaper wholesale?", MIT working paper.

- [18] Joskow, P.L., 2006, "Markets for power in the United States: an interim assessment", *The Energy Journal*, 27 (1), 1-36.
- [19] Joskow, P.L. and Tirole, J., 2006, "Retail electricity competition", *Rand Journal of Economics*, 37 (4), 799-815.
- [20] Klemperer, Paul, 1995, "Competition When Consumers Have Switching Costs: An Overview with Applications to Industrial Organization, Macroeconomics, and International Trade", *Review of Economic Studies*, 62 (4), 515-39.
- [21] Laffont, J.J. and Tirole, J., 2000, "Competition in Telecommunications", MIT Press, Cambridge, MA.
- [22] Léautier, T.O., 2013, "Is mandating "smart meters" smart?", *The Energy Journal*, forthcoming.
- [23] Littlechild, S., 2000, "Why we need electricity retailers: a reply to Joskow on wholesale spot price pass-through", Cambridge Working Paper in Economics.
- [24] Littlechild, S., 2002, "Competition in retail electricity supply", *Journal des Economistes et des Etudes Humaines*, Berkeley Electronic Press, 12 (2), 12.
- [25] Littlechild, S., 2005, "Smaller suppliers in the UK domestic electricity market: experience, concerns and policy recommendations", OGFEM Report, London.
- [26] Littlechild, S., 2009, "Retail competition in electricity markets - expectations, outcomes and economics", *Energy Policy*, 37 (2), 759-763.
- [27] Mansur, E., 2007, "Upstream competition and vertical integration in electricity markets", *Journal of Law & Economics* 50 (1), 125-156.
- [28] Mirabel, F. and Poudou, J.C. , 2004, "Mechanisms of funding for Universal service obligations: the electricity case", *Energy Economics*, 26 (5), 801-823.
- [29] Newbery, D.M. and Pollitt, M.G., 1997, "The restructuring and privatisation of Britain's CEBG: was it worth it? ", *The Journal of Industrial Economics*, 45(3), 269-303.
- [30] Ofgem, 2002, "Review of domestic gas and electricity competition and supply price regulation: conclusion and final proposals", London.
- [31] Ofgem, 2004, "Domestic Competitive Market Review", London.
- [32] Ofgem, 2007, "Domestic retail market report" , London.
- [33] Ofgem, 2012a, "The retail market review - updated proposals for businesses", London.
- [34] Ofgem, 2012b, "The retail market review - updated domestic proposals", London.
- [35] Panzar, J., 2000, "A methodology for measuring the costs of universal service obligations", *Information Economics and Policy*, 12(3), 211-220.
- [36] Pollitt, M., 2008, "Liberalization and regulation in electricity systems: how can we get the balance right?", in "*Competitive electricity markets: design, implementation, performance*", Sioshansi, F.P., Elsevier Science, Oxford.
- [37] Polo, M. and Scarpa, C., 2011, "Liberalizing the gas industry: take-or-pay contracts, retail competition and wholesale trade", IEFE Working Paper n. 49.
- [38] Steiner, F., 2001, "Regulation, industry structure and performance in the electricity supply industry", *OECD Economic Studies*, No. 32, 2001/1 .

- [39] Vázquez, C., Batlle, C., Lumbreras, S. and Pérez Arriaga, I.J., 2006, "Electricity retail regulation in a context of vertical integration: the debate on regulated tariffs", IIT Working Paper.
- [40] Wilson, C. and Waddams Price, C., 2010, "Do consumers switch to the best supplier?", *Oxford Economic Papers*, 62 (4), 647-668.
- [41] von der Fehr, N.H. M. and Hansen, P.V., 2010, "Electricity retailing in Norway", *The Energy Journal*, 31 (1), 26-45.

Appendix

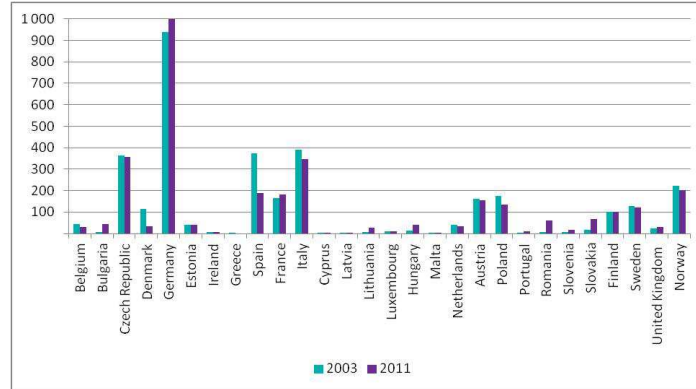


Figure 3: Total number of electricity retailers to final consumers, 2003-2011.

Source: Authors' elaboration on Eurostat data.

Note: Finland and Germany only present estimated figures; in Spain distribution companies were included in the number of electricity retailers to final customers until the end until end of June 2009.

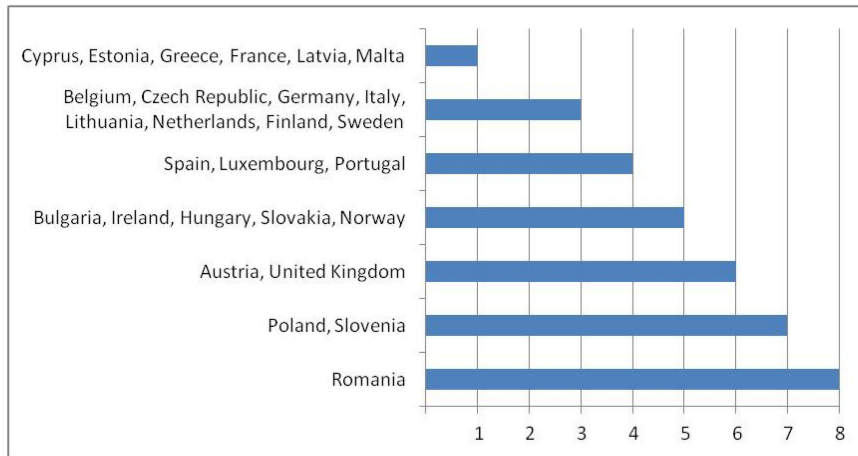


Figure 4: Number of main retailers, 2010.

Source: Authors' elaboration on Eurostat data.

Note: Denmark is excluded because of missing information; in Netherlands only main retailers selling electricity to small consumers are considered.

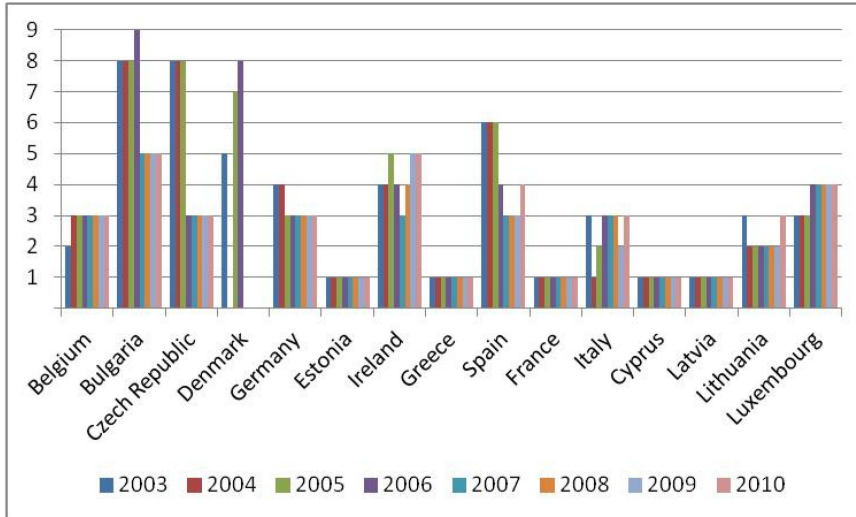


Figure 5: Number of main electricity retailers, 2003-2010.
Source: Authors' elaboration on Eurostat data.

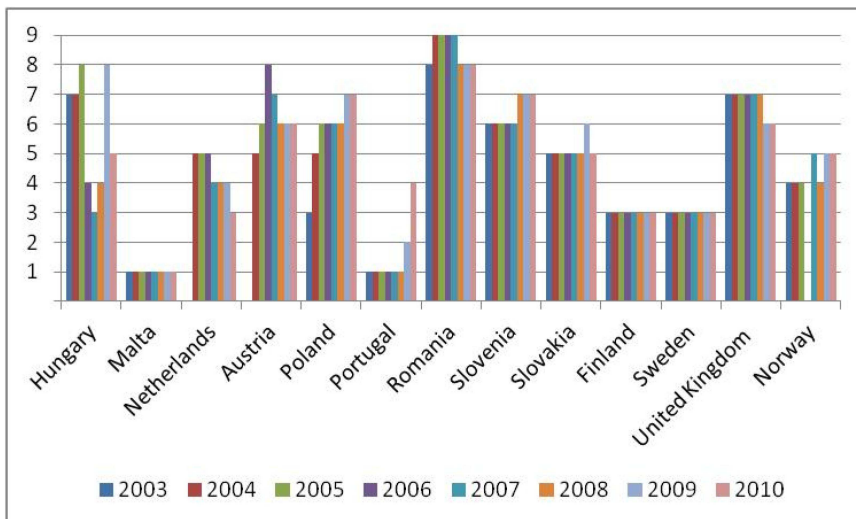


Figure 6: Number of main electricity retailers, 2003-2010.
Source: Authors' elaboration on Eurostat data.

Note: Some information about Denmark are missed; in Netherlands only main retailers selling electricity to small consumers are considered.

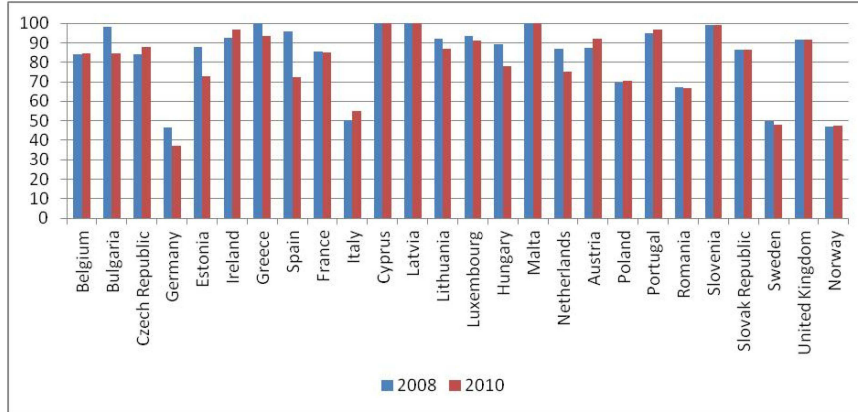


Figure 7: Evolution of cumulative market share of main retailers (%), 2008/2010.

Source: Authors' elaboration on Eurostat data.

Note: Denmark and Finland are excluded because of missing information.

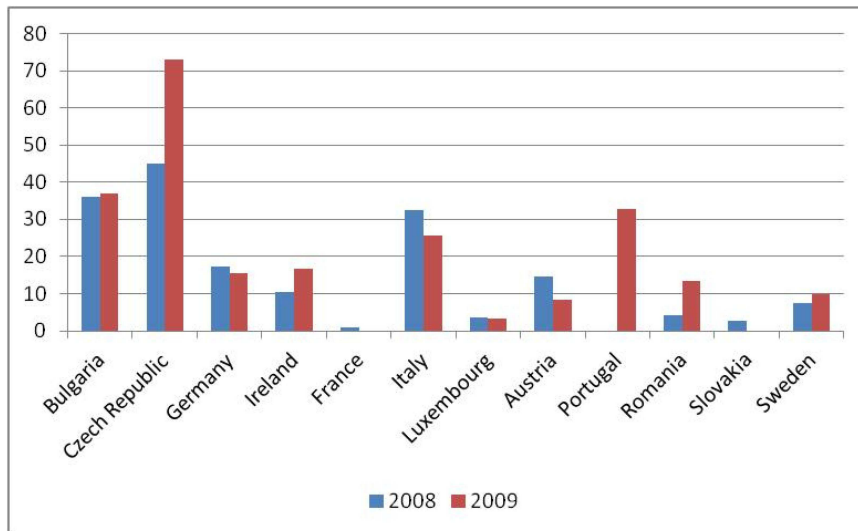


Figure 8: Annual switching rate for large industry (by eligible meter points; %), 2008-2009.

Source: Authors' elaboration on European Commission data.

Note: Belgium, Denmark, Estonia, Finland, Great Britain, Greece, Hungary, Norway, Poland, Spain and the Netherlands are excluded because of missing data; Cyprus, Latvia, Lithuania, Malta and Slovenia have registered zero switchings.

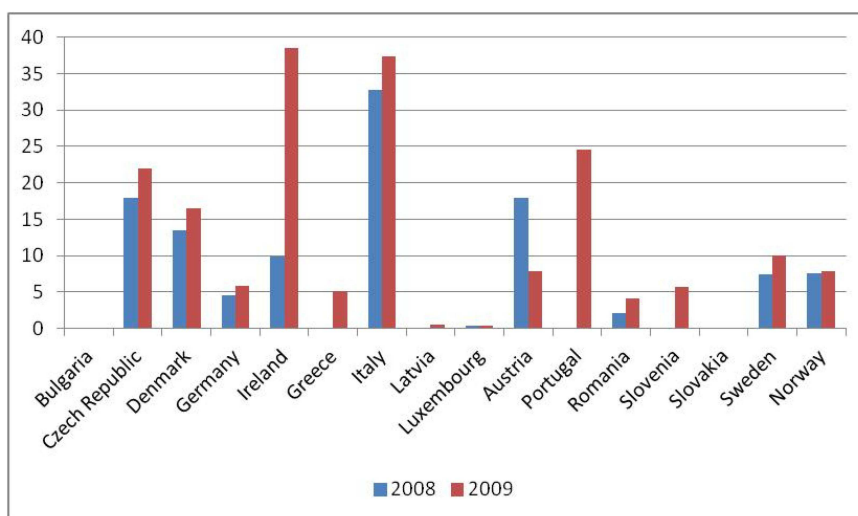


Figure 9: Annual switching rate for medium sized industry (by eligible meter points; %), 2008-2009.
Source: Authors' elaboration on European Commission data.

Note: Belgium, Estonia, Finland, France, Great Britain, Hungary, Poland, Spain and the Netherlands are excluded because of missing data; Cyprus, Lithuania and Malta have registered zero switchings.

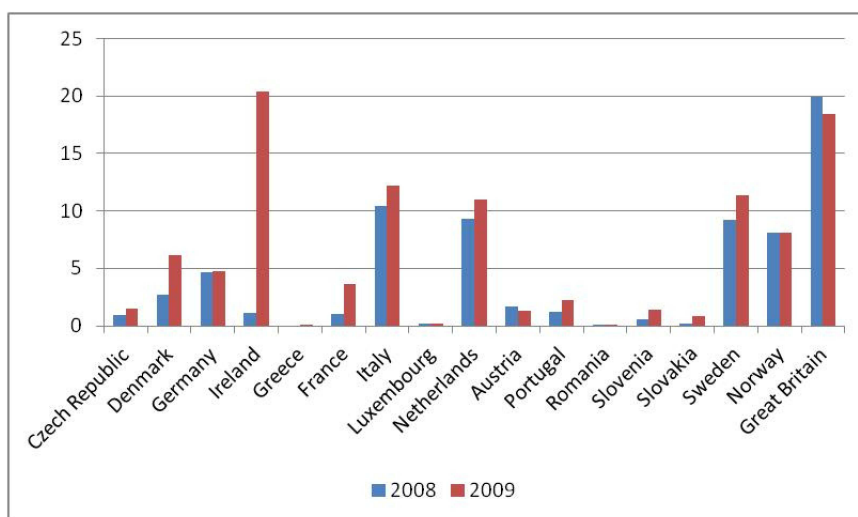


Figure 10: Annual switching rate for small industry and households (by eligible meter points; %), 2008-2009.
Source: Authors' elaboration on European Commission data.

Note: Belgium, Finland, Hungary, Poland and Spain are excluded because of missing data; Bulgaria, Cyprus, Estonia, Latvia, Lithuania and Malta have registered zero switchings.