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CONSUMER PROTECTION THROUGH PRICES: AN ANALYSIS OF THE ENERGETIC SECTOR IN EUROPEAN UNION COUNTRIES

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Abstract

Services of general economic interest (SGEI) are usually offered on markets characterized by monopoly, oligopoly, governmental or local authorities control or other forms of market imperfection. Consequently, issues related to consumer protection also present some particularities. In the energetic sector, the product offered (electricity) is absolutely homogeneous, allowing only consumer protection through price. Our study analyzed the presence of this phenomenon in the 27 countries of the European Union. Data was collected from official institutions, such as the World Bank, Europe's Energy Portal and the National Institutes of Statistics of the member states. Based on OLS regressions we demonstrated the existence of price-based protection for domestic consumers at EU level. Prices are regulated in such a way as to be correlated with the average wage. As an additional argument, we demonstrated that the energy price for industrial consumers follows a different formation mechanism, with main influence factor the energy import dependence.

Keywords: services of general economic interest, consumer protection by price, energy import dependence, OLS regression, European Union countries

JEL Classification: D18, D12, C21,

Introduction

It is very important for consumers to know their rights and that these rights are respected in those economic activities that generate results for the benefit of general public, namely the services of general economic interest (SGEI). Dinu (2012) considers the right to information one of the most important consumer's rights because it enables the freedom of informed choice. The consumers' protection for the SGEI's becomes more and more

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important in the context of the liberalization and privatization of public enterprises providing them.

Ensuring competition on the market is a very important objective in the case of SGEI's because it helps assure that the firm chosen to provide the SGEI can accomplish this task efficiently and that the firm is not excessively compensated (Clemenz et al., 2006). Some recent researches deal with themes linked to the protection of the consumer rights for services of general economic interest:

- Mak (2008) studies the impact of fundamental rights on the regulation of I-Consumer Contracts (digital information services). On the consumer's side the fundamental rights include privacy and freedom to receive information, while on the author's side we talk about protection of property rights.
- Schovsbo (2008) refers to copyright legislation and considers the implementation of consumer rights "a trade-off between right holder incentives and consumer access". He concludes that the role of lead character "is reserved for the public interest".
- Bacchiocchi et al. (2011) consider, in an empirical study on 15 EU countries, that in the telecommunication sector the public ownership is an appropriate solution, emphasizing the role of market regulation in the pricing policy. They found that privatization does not increase the quality perception of the service but the openness of a market. For the transition countries there is a strong correlation between telecommunication liberalization and economic development - Dvornik and Sabolik (2007) and Dragos and Dragos (2012).
- Hegger et al. (2011) analyze the Dutch consumers' perception on water supply companies. The consumers agreed that the water supply system ust be represented by responsible public organizations preoccupied to protect the environment and to supply high quality water.
- Ciomos et al. (2012) analyzed the price elasticity of residential water demand in Romania, observing that the increase of the tariffs determined a substantial reduction of the residential water consumption. The consumers accepted the price increase, justified by higher quality of the water and associated services. Also for Romania, Teodosiu et al. (2012) assess the problems of sustainable water resource management in order to reduce environmental impacts and increase quality of life for consumers by reducing health risks. Dinu et al. (2012) discuss the importance of ecological labelling for reducing water consumption and for promoting environment protection.
- Simoes et al. (2010) examine the influence of the effective environment on the efficiency of the Portuguese municipal solid waste (MSW) system, concluding that the strong regulatory model contributed significantly to the improvement of services quality. They also prove that efficiency of solid waste economic regulator increases with GDP and decreases for high density areas, and that private utilities indicate better performances than the public ones. Scortar et al. (2009) proposed a scheme for managing waste in the Cluj County as a part of a circuit for recycling the useful materials contained in waste. The improvements of water, soil and air quality and of the population's health are only some of the advantages of this project implementation. And reality has proven that waste management is very important. Different accidents, such as the wall of red mud in Hungary, in October, 2010, emphasize how much life quality can be influenced and the need for emergency solution to protect consumers (Kovacs et al., 2012).

Another important aspect of the European strategy for SGEI's is to ensure enforcement of the consumer protection rules through information, education and redress. A disputed part of the laws regulating the functioning of SGEI's concerns the excessive compensation and

competition for the market. When it comes to competition on the market, if there is no over-compensation the SGEI will have no serious distortive impact over international competition. The revised package of EU State Aid rules for the assessment of public compensation for services of general economic interest adopted in 2011 has substantially limited the member's state discretion to organize larger SGEI (Buendia Sierra, Panero Rivas, 2013).
The SGEIs offer consumers a very diverse range of products and services. As a consequence, consumer protection is also done distinctively, depending on the proposed good or service. These features can be studied individually, for each sector or market. The energetic sector has at least one particular characteristic: the product is absolutely homogeneous. Consequently, there is no question of providing a certain quality level. In this case, consumer protection is done, almost exclusively, through price valorization. Our study demonstrates the existence of such protection mechanism at EU level.

The paper is organized as follows: Section 2 presents some of the main issues related to consumer protection on the electricity market, Section 3 describes the research hypotheses, data and results and Section 4 provides the conclusions.

1. Consumer protection problems specific to the electricity market

As already stated the electricity market has one major feature – it provides a homogeneous product. However, it has another important characteristic – a very heterogeneous group of consumers. Electricity is used by anyone, rich or poor, and in any field, domestic or industrial. Consequently, problems that may appear are very complex and have to be carefully assessed. That is why the European Union is very interested in setting to rights this field. Even the basis of the Union is related to services of general economic interest. The goal is to have, one day, a single electricity market for all EU citizens, with their rights clearly stated and protected (COM, 2003; 2007). However, this is quite difficult as reality has demonstrated the heterogeneity of the member states. Nevertheless, the electricity market is an important subject in all countries of the world, as people become more and more addicted to it. The problems specific to the electricity market from the consumer protection point of view are interdependent. Yet, we have tried in the following part of the research to group them in three major categories: consumer profile, pricing and liberalization versus regulation of the electricity market.

1.1. The profile of the electricity consumer

Studies have been made trying to establish consumers' profile on the electricity market. The main goal is to help the policy decision process (Faiers et al, 2007). At a glance, there are two major groups – domestic and industrial consumers. And, usually, all the strategies are constructed based on this division. However, practice has proven that households need a more careful approach. That is why, usually, studies of this kind are made on domestic electricity clients. It is very important to know the clusterization of citizens based on their behaviours as energy consumers. In this way, issues of consumer protection in this field can be easier implemented and problems more rapidly solved. Such a study was made on the Swiss energy market (Sutterlin et al., 2011). It revealed six types of energy consumers, each described based on its characteristics: the materialistic, the selfless inconsequent, the thrifty, the convenience-oriented indifferent, and the problem-aware well-being-oriented type. Important from the consumer protection point of view is that the study emphasized

the importance of financial issues for each group of clients, the level of regulation and intervention accepted, and the degree of concern related to personal comfort.

Efficiency is another important aspect related to the profile of electricity consumers, manifested especially in what regards the type of appliances they buy (Wirl, 1995). What is more important for consumers – cost, environment or efficiency? This question is based on the fact that usually environmental friendly electric appliances, which evidently, are more efficient, are also more costly than the others. And they do not necessarily have a longer operating life than the older ones, less efficient. In a study made on European consumers, Gaspar and Antunes (2011) assessed basically exactly this matter. They showed that cost is the most important characteristic taken into consideration when purchasing appliances and quality when purchasing technology. In the conducted survey, energy consumption was on the third place as feature for the appliance. This result shows that beside the actual acquisition cost, the utilization cost is also very important. And the latter goes hand in hand with the price of electricity. However, Wirl (1995) drew attention upon the reactions consumers might have to different programmes (such as incentive based ones) that might become counterproductive.

A very important type of consumer is pointed out by European energy strategies. The European Social Model speaks about the vulnerable consumer that has to be protected. This group consists in the low income households that are the most affected by any change in electricity tariffs (Waddams Price and Pham, 2009). The whole problem was concentrated in the term "affordability" – there is a European Commission Policy called Affordability of Energy Supply, which states the right to reasonable prices for everyone, in such a way as the client to have the ability to pay for the electricity service (Bartl, 2010). Consequently, a mix of measures has to be applied in order to "protect" this category of disadvantaged consumers. The issue of affordability has become even more important with the appearance of the International Financial Crisis, as the trend in the European Union countries was to increase taxes (Zai, 2012). Due to this, the fiscal burden becomes even higher exactly for the vulnerable consumer that should be protected.

The most recent trend is for the green energy use. Consequently, studies that assess the types of electricity consumers consider this aspect, too. (see for example Menges, 2003). In the end, the most important feature of the electricity consumer is the desire of quality at the lowest price possible.

1.2. Pricing

The most important aspect in what regards services of general economic interest, electricity included, is the price. It represents the centroid of all the development strategies in this sector. The goal is to have, in the end, a happy consumer, that would not make any complaints. And research has demonstrated that, at least for the EU-15 citizens, the level of electricity prices strongly influences consumers' attitude (Fiorio and Florio, 2011).

As stated above, the lowest level of price is also important for the protection of vulnerable consumers. This level must be established in such a way as to ensure the possibility to pay for the service of individuals who want it, guaranteeing the access to electricity for everyone. There are different ways of insuring this. An example would be establishing a minimum price to be used on the market (Bartl, 2010; Percebois and Wright, 2001). Other measures would involve the endowment of incentives, in different forms (Wirl, 1995; Pettersen et al, 2005, COM, 2011). For example, in the second study, Pettersen et al (2005)

built and analyzed a model constructed on the game theory principles in which incentives are offered to consumers to switch their load. Price differentials for peak and off-peak electricity consumption are also assessed in the field's literature. Thorsnes et al. (2012) show that the switch of consumption in accordance with the price level is influenced by the size of the household, the time spent away and the use of electricity for heating water.

1.3. Liberalization versus regulation of the electricity market

The European Union strategies in respect to the energy market have as main goal liberalization. The issue must be carefully assessed, as usually it implies the disappearance of the protectionist measures for the most vulnerable consumer (Waddams Price and Pham, 2009). Discussion is still open, as practice has demonstrated that national markets react differently to the process. The whole liberalization idea came from the fact that it would be in the consumer's interest to get rid of the state involvement on the energy market, as it is inefficient (Bartl, 2010). Different studies (Prosser, 2005; Grenfell, 1999) have made the European institutions to change this opinion and realise that in order for the liberalization process to take place, additional regulations are necessary. The main reason for this is the need to protect consumers' interest. Even back in 2003 the European strategies assigned a higher level of importance for consumer protection in what regards the services of general economic interest (COM, 2003). The Communication of the European Commission (2003) even states the five tools for increasing consumer protection in the field: universal service obligation, continuity, quality of service, affordability and user and consumer protection. Bartl (2010) presents four cases of "liberalization processes" on the electricity market. The study compares the UK, France, the Czech Republic and Slovakia on their paths to ensuring affordable energy for all. It emphasizes the fact that this goal can be achieved in different ways – regulations, price caps, competition, etc.

France and the United Kingdom make the object of several studies. For example, Percebois and Wright (2001) compare the two systems – the state-owned French with the state-owned and then liberalized British. They show that the performance of the French system is much better for the electricity industry. Liberalization has brought improvements only for British industrial electricity consumers, while the domestic ones did not feel any price reductions. In conclusion, for the analyzed period, the process failed to do exactly what it was intended for – increase domestic consumer protection. Considering Netherlands along with the two markets mentioned above, Niesten and Jolink (2012) conclude that there is a need for increasing the protection of consumer interest as on such competitive markets, the consumer is negatively affected by network operators that tend to have opportunistic behaviour. The importance of regulation has not been demonstrated only for EU member states. Studies on the Turkish electricity market also emphasize the need for regulation and market design (Bahce and Taymaz, 2008). In the same time, in other parts of the world, such as Kenya, the need for improvements in the regulatory system was put into light, as the electricity sector proved to have the lowest level of consumer satisfaction (Mutua et al, 2012).

From the point of view of consumer protection, regulation must exist especially in the form of laws and specifications related to dispute resolutions. The main problem is that consumers tend to have the weakest position "at the bargaining table" (Xu and Yuan, 2009). All in all, in the study of Fiori and Florio (2011) it is shown that the best situation from the consumer's perspective is to be found in countries where public and private ownership of the electricity system co-exist. Using the Eurobarometer data, they

demonstrate that privatisation leads to an increase in the dissatisfaction level, instead of a decrease.

2. Research hypotheses, data and results

As the field's literature shows, services of general economic interest (SGEI's) are characterized by some specificities in respect to consumer protection. The latter has to be protected bearing in mind his position on the market as a demand representative. The electricity market is even more specific. It represents the characteristic of supplying a homogeneous, non-differentiable product. Based on data gathered for the EU member states we show that consumer protection through price is omnipresent. Data was gathered from three main sources:

- Europe's Energy Portal (2013) for data regarding the energetic sector
- World Bank (2013) for GDP per capita
- National Institutes of Statistics of the EU member states joined in a common source - Wikipedia (2013) for the average monthly salary.

For a complete image of the variables used, together with their definition we present some descriptive statistics (Table 1).

Table no. 1: Descriptive statistics of the variables used

Variable	Variable description	Mean	St. dev.	1st quartile	3rd quartile
HOUSE_PRICE	Retail (end-user) energy prices (€ per 10^3 kWh) for households	174	49	144	204
IND_PRICE	End-user energy prices (€ per 10^3 kWh) for industrial consumers	100	26	82	104
WAGE	Monthly average wage (net, 10^3 US$)	1.858	1.172	0.826	2.698
GDP_CAP	Gross domestic product (current 10^3 US$) divided by midyear population	33.941	22.604	17.089	47.543
DEPENDENCE	Energy import dependence (%) of E.U. member states	55.9	27.9	36.9	76.8

Source: own calculation using data from Europe's Energy Portal (2013), World Bank (2013) and Wikipedia (2013)

The mechanism of consumer protection through prices is emphasized in this study using econometric models. For the reasoning of the construction of these models we will, firstly, make some qualitative appreciations on the available data. These will be different, according to the type of final consumer: household or industrial consumer.

2.1. Descriptive analysis of energy price for households

As a first step in the analysis, before regression modelling, we can make suppositions regarding the price mechanism for households through descriptive analyses of the HOUSE_PRICE (figure 1) and WAGE (figure 2) variables.

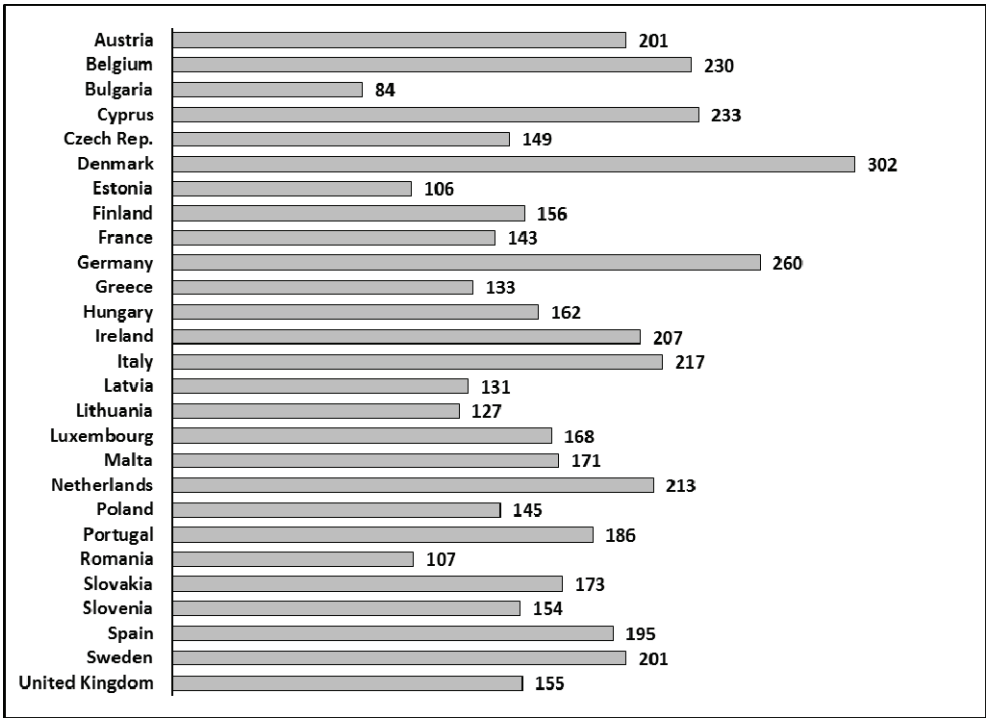

Figure no. 1: Retail energy prices (€ per 10^3 kWh) for households.
Source: data from Europe's Energy Portal (2013)

Even at a glance, one can observe the low level of prices in the less developed members of the EU (Bulgaria, Estonia, Romania, Lithuania, Latvia, and Greece). At the antipode, prices are high in countries with a sound economy (Denmark, Germany, Netherlands, and Belgium). Special situations are in France (with a very high share of nuclear energy) or Cyprus (almost entirely dependent on energetic imports).

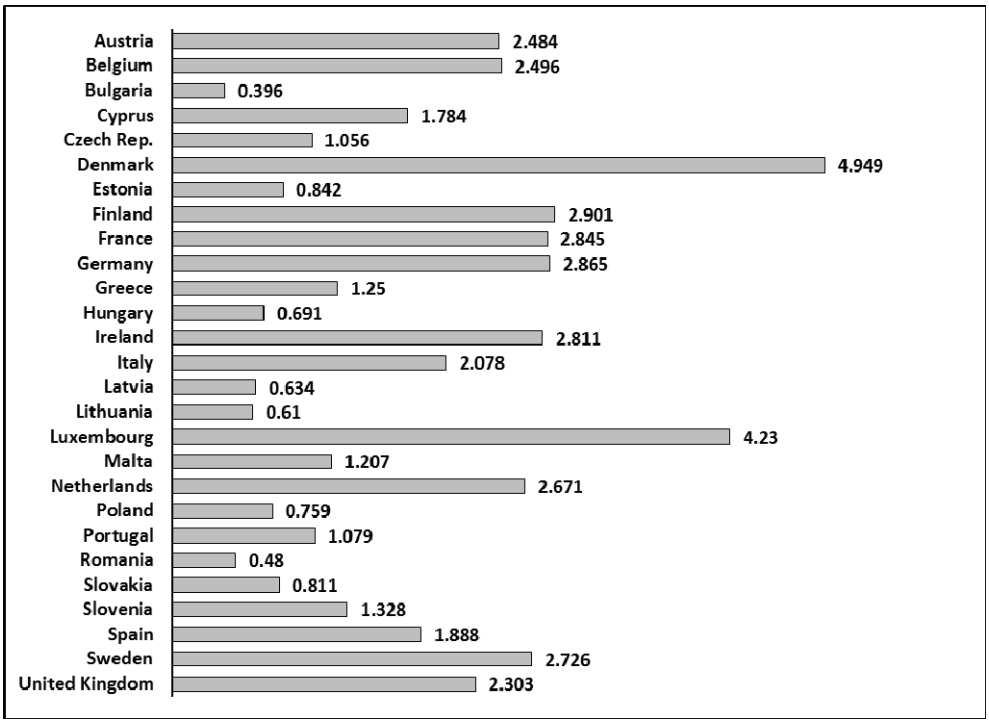

Figure no. 2: Monthly average wage (net, 10^3 US$).
Source: data from Wikipedia (2013)

Out of the disposal of the values in figures 1 and 2, one can notice a direct relationship between price and monthly average net wage. If this correlation is also statistically significant, it can be a good presumption to assert that at European level there is a consumer protection system on the energetic market. However, the supposition must be verified through the assessment of the price formation mechanism for industrial consumers. If the latter is fundamentally different, we can conclude that there is a consumer protection system.

2.2. Descriptive analysis of energy prices for industrial consumers

The study follows the same path as for the previous paragraph. We start with the descriptive analyses of the variables considered. Economic logic indicates a correlation between IND_PRICE (figure 3) and GDP_CAP (figure 4). The main idea is that less developed countries subsidize more the low prices for industrial consumers in order to increase the international competitiveness of enterprises.. On the other hand, only developed economies have the necessary financial force for a significant valorisation. This would lead to a negative correlation between IND_PRICE and GDP.

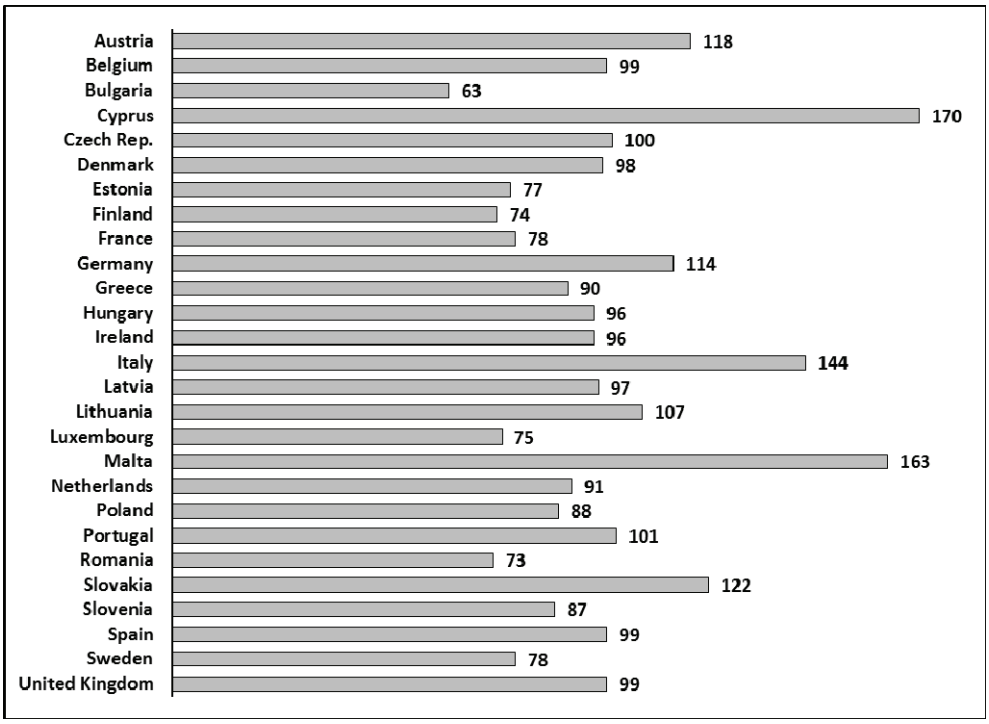

Figure no. 3: End-user energy prices (€ per 10^3 kWh) for industrial consumers.
Source: data from Europe's Energy Portal (2013)

We observe a different situation from the one of the households' prices. National economies of different development levels exist both in the group of countries with the lowest prices (Bulgaria, Estonia, Finland, France, Luxembourg, Romania, Sweden) and in the one with the highest (Cyprus, Italy, Malta, Germany, Slovakia).

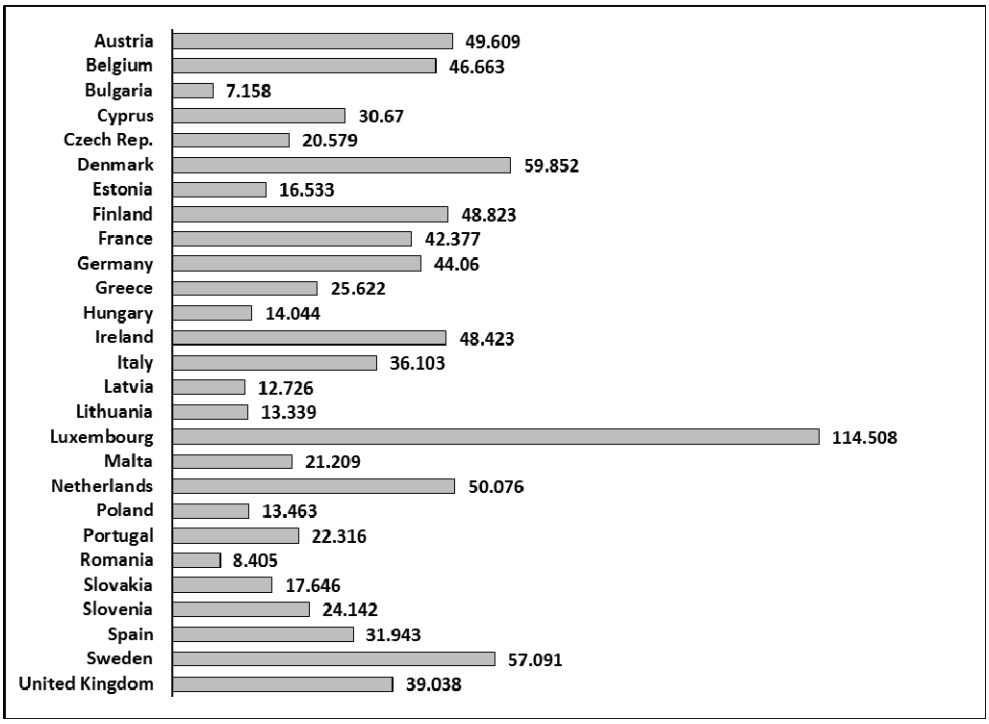

Figure no. 4: Gross domestic product (10^3 US$) divided by midyear population
Source: data from World Bank (2013)

Apparently, the relationship between GDP per capita and prices for industrial consumers is less evident than the one between the monthly average wage and prices for households. Statistics computations confirm this hypothesis, the linear correlation coefficient (R) between GDP_CAP and IND_PRICE being -0.113, up against 0.700 between WAGE and HOUSE_PRICE. These results induce the idea that price formation for economic agents has a totally different mechanism. When speaking about production costs, the human resource cost is insignificant. Therefore, the final price is poorly influenced by the average wage. Material resources have a cost difficult to estimate, due to the fact that it embeds the cost of exhaustible resources' scarcity. This cost of material resources is very different from the exploitation cost. From this point of view, European countries are more or less gifted. The dependence on energy imports varies significantly from one member to the other (figure 5) suggesting the idea that price can be significantly influenced by this factor.

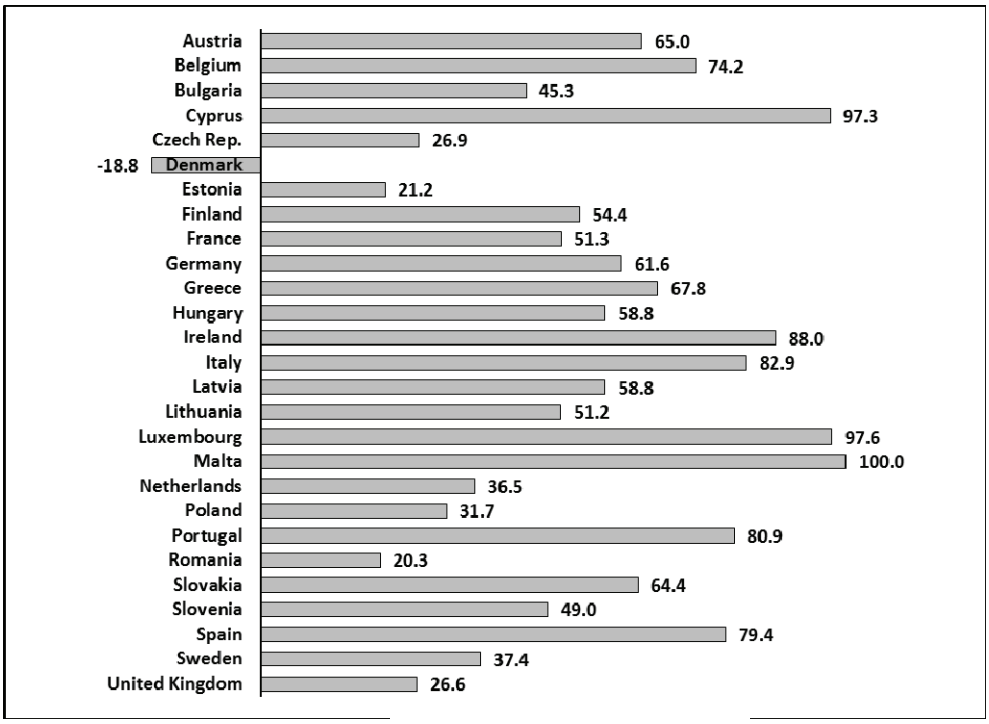

Figure no. 5: Energy import dependence (%)
Source: data from Europe's Energy Portal (2013)

When comparing figure 5 with figure 3, a positive relationship between energy import dependence and energy prices for industrial consumers is noticeable. Statistically, the linear correlation coefficient (R) between variables DEPENDENCE and IND_PRICE is 0.500.

2.2. The econometric analysis of energy price formation

To validate the hypotheses stated in the previous paragraphs, we have employed OLS regressions for a cross-section of E.U. countries, with HOUSE_PRICE and IND_PRICE as endogenous variables. We chose four linear specifications:

$$HOUSE_PRICE_i = f(WAGE_i) + \varepsilon_i \quad \text{(eq. 1)}$$

$$HOUSE_PRICE_i = f(WAGE_i, DEPENDENCE_i) + \varepsilon_i \quad \text{(eq. 2)}$$

$$IND_PRICE_i = (GDP_CAP_i) + \varepsilon_i \quad \text{(eq. 3)}$$

$$IND_PRICE_i = (GDP_CAP_i, DEPENDENCE_i) + \varepsilon_i \quad \text{(eq. 4)}$$

The error term ε_i is assumed to have the standard classical properties.

Table no. 2: The impact of exogenous variables on HOUSE_PRICE and IND_PRICE (OLS coefficients and p-values)

	HOUSE_PRICE		IND_PRICE	
	equation 1	**equation 2**	**equation 3**	**equation 4**
WAGE	29.50***(0.000)	29.75***(0.000)	.	.
GDP_CAP	.	.	-0.130 (0.575)	-0.236 (0.247)
DEPENDENCE	.	0.232 (0.371)	.	0.496***(0.005)
Constant	119.6***(0.000)	106.2***(0.000)	104.3***(0.000)	80.20***(0.000)
	R^2 = 0.490 N = 27	R^2 = 0.506 N = 27	R^2 = 0.013 N = 27	R^2 = 0.292 N = 27

***, **, *: significant at 1%, 5% and 10% level
Source: own calculations using STATA 9.1 software.

Table 2 shows that both in the case of eq. 1 and eq. 2, the variable WAGE is statistically significant at the highest level possible, 99%. On the contrary, variable DEPENDENCE is not significant and its introduction in eq. 2 leads to a negligible increase in R^2. Eq. 3 and 4 emphasize the fact that the mechanism of energy price formation for industrial consumers is fundamentally different. Globally, both the descriptive analyses previously made and the econometric models demonstrate the existence of domestic consumer protection through prices in the members of the European Union.

Conclusions

Based on the cited specific literature and on the own empirical observations, we showed some characteristics of consumer protection in the field of services of general economic interest. We particularized the study for the energetic sector. The latter has at least one original feature: the product is absolutely homogeneous; it is not of multiple qualities. Using regression modelling we have demonstrated the existence of a consumer protection policy through prices at the level of the European Union member states. The delivery costs for electricity are not correlated to the production costs or to the energetic dependency, but to the average wage. However, this protective policy is not to be found in the industrial sector, where the energy price is more related to the import dependency.
The present study leads the way toward future developments. A subject of discussion may be the optimum level of protectionism that combines consumers' interest and the competing needs of the market. Another idea would be to discuss the optimum level of price such as to stimulate a certain, desired structure of the production resources: hydro, thermo, nuclear or renewable resources. Beyond these economic needs, electricity, as food, have to remain basic products, available to population in decent quantities. Consequently, the role of the state as a regulating and protectionist organism remains crucial.

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