

XIII REUNION DE ECONOMIA MUNDIAL

Ciudadanos heterogéneos y consumidores vulnerables ante la integración europea de los servicios públicos de infraestructura

Heterogeneous citizens, vulnerable consumers and the European integration of public infrastructure services

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RESUMEN:

Aunque la desregulación y apertura a la competencia de los servicios públicos de infraestructura, clave para la integración europea, pretendía beneficiar unívocamente a los ciudadanos como consumidores, actualmente la Comisión Europea se replantea sus repercusiones sobre los mismos. El objetivo principal de este trabajo es, en dicho contexto, evaluar las políticas de regulación de estos servicios desde la perspectiva de los ciudadanos. Para ello, se desarrolla un análisis microeconómico de las decisiones de gasto y la insatisfacción con el precio de los servicios de electricidad y telecomunicaciones en dos grandes países europeos: España y Reino Unido. Los resultados obtenidos reflejan la heterogeneidad de los ciudadanos como consumidores, ligada a sus condicionantes socioeconómicos y los problemas de satisfacción, participación y confianza que, donde las reformas han sido más ambiciosas, experimentan aquellos particularmente vulnerables.

Palabras clave: integración europea, servicios públicos de infraestructura, regulación, ciudadanos, consumidores.

Clasificación JEL: D12, D18, F15, L97, L98.

ABSTRACT:

Deregulation and opening to competition of public infrastructure services, key to European integration, would benefit all the citizens, assuming they took homogeneously optimal consumption choices in the market. However, the European Commission is currently rethinking the design of regulation from the point of view of citizens as consumers. The main objective of this paper is, in this context, to evaluate the regulatory policies of these services from the citizens' perspective. To do so, a microeconomic analysis of spending decisions and dissatisfaction with the price of electricity and telecommunications is developed for two large European countries: Spain and the United Kingdom. The results reflect the heterogeneity of citizens as consumers, linked to their socio-economic conditions and problems of satisfaction,

participation and trust, where reforms have been more ambitious, experienced by those particularly vulnerable.

Keywords: European integration, public infrastructure services, regulation, citizens, consumers.

JEL classification: D12, D18, F15, L97, L98.

1. Introduction

Public infrastructure services - such as electricity and gas, water, communications and public transportation - experienced an extended period of stability in their modes of organization and regulation in Western European countries from around the end of World War II to the late 1970s (Millward, 2005). During this period, the dominance of public ownership of these sectors was justified by arguments about the existence of market failures (in particular, natural monopolies), the strategic and economic importance of many of the services, as well as concerns about social justice (Comín and Díaz-Fuentes, 2004; Van de Walle, 2009). Public ownership helped act as a regulatory mechanism to resolve the conflict of interest between investors and consumers (Newbery 2004). However, from the late 1970s onwards, these services were subjected to deep reform. In the context of the European Union, this reform intensified sharply during the 1990s, particularly due to processes of market integration and liberalization policies in these sectors (Bauby, 2008; Bognetti and Obermann, 2008). In parallel, Member States embarked upon the privatization of many of these services.

Reform of public infrastructure services, particularly liberalization, deregulation and privatization, was founded on neoclassical economic theory which rested on two critical sets of assumptions. Firstly, it assumed that exposing firms to competition would result in lower prices and increased service choice for consumers. Both from the theoretical perspective (Armstrong and Sappington, 2006) as well as *ex-post* empirical analysis of price and choice (Fiorio and Florio, 2009), it has been shown that these reforms did not necessarily always deliver the promised results. Secondly - and more importantly for this article – it was assumed that citizens, cast as rational consumers, would be positioned to benefit universally from these developments (EC, 2004). From the outset of reform, however, concern had been expressed by some agents about whether, under market-driven rules, traditions of public service obligations and universal access would be undermined, and that citizens' would end up receiving lower quality services (CEEP and ETUC, 2000). Pressure was placed upon the European Commission (EC) to guarantee certain service standards, in the form of a directive or citizens' charter: after a series of consultations, communications and white papers, the EC officially recognized in a protocol of the Treaty of Lisbon that "Services of General Interest" were key to the upholding of social and territorial cohesion, strengthening solidarity and equity, thus preserving values such as universal access, affordability, quality and continuity were stated to be priorities (EC, 2007a).

Now, despite the fact that reform was implemented in the name of the consumer, relatively little effort went into evaluating these reforms from the citizen, or even, the consumer, perspective (Fiorio and Florio, 2008; Clifton and Díaz-Fuentes, 2010). This relative neglect has started to change recently, spurred by two main developments. Firstly, the EC has officially recognized that problems remain in making the market work, particular, in these infrastructure services (Dierx *et al.*, forthcoming). Secondly, policy-makers have become interested in how theoretical insights borrowed from behavioral economics might be applied to improving ongoing reform by better understanding consumer behavior. Interest in behavioral economics by policy-makers started among the Anglo-Saxon oriented institutions, including the Australian Government (2007), the Federal Trade Commission (2007), the British

Institute for Government (2010), as well as the OECD (2008 and 2010).¹ From there, ideas were diffused to the EC, which became interested in how these insights could be used to improve public infrastructure regulation, in order to make the market work more efficiently whilst improving citizen well-being and satisfaction (EC 2008a and 2010). This new approach, moreover, was mooted as being able to help to develop policies to address emerging concerns such as “vulnerable consumers”.²

In this light, the objective of this article is to evaluate public infrastructure regulation from the perspective of citizens as consumers, focusing particularly on consequences for equity and social cohesion. In order to examine how socio-economic differences affect expenditure and satisfaction, the analysis focuses on the decisions and attitudes of those potentially becoming “vulnerable consumers” through their belonging to three dimensions: those who do not work; the elderly; and/or the less-educated. We focus on two major infrastructure services where reforms have been particularly intense, telecommunications and electricity, and consider two large European countries where reform is advanced, the United Kingdom (UK), reform pioneer in the European context, and Spain, which also implemented deep reforms, albeit later, during the 1990s.

The rest of the article is structured as follows. The second sketches the extent of reform of telecommunications and electricity in the UK and Spain before explaining how behavioral economics and its insights could be applied in an effort to better understanding consumer behavior in these markets. The third section presents the data used and the methodology. Next, an empirical examination is conducted of the impact of socio-economic dimensions that have been associated with greater consumer vulnerability, through contrasting stated preferences (dissatisfaction with price) and revealed preferences (spending decisions), in the fourth section. Finally, in the conclusions, findings are presented, together with conclusions and future research questions.

2. Rethinking public infrastructure regulation

2.1. Reforming public infrastructure in the UK and Spain

The UK and Spain represent two major European economies where reforms in the telecommunications and electricity sectors were intense and far-reaching. The UK was the reform pioneer in Europe; Margaret Thatcher set into motion an ambitious programme including liberalization, deregulation and privatization from the 1980s (Florio, 2004). Intense reform of these sectors in Spain followed, during the 1990s, responding in particular to the requirements of the EC liberalization directives (Clifton, Comín and Díaz-Fuentes, 2006 and 2007; Dubois and Saplacan, 2010). Across Europe, reform came earlier and deeper in telecommunications than in

¹ On the argument the OECD was born and fundamentally remains an Anglo-Saxon institution, see Clifton and Díaz-Fuentes (2011).

² The concept of “vulnerable consumers” generally refers to citizens who, as consumers, are perceived as being more likely to find process of market learning more complex due to spatial, inter-generational, financial and social reasons. See Burden (1998), OECD (2008) and Hogg, Howells and Milman (2007).

electricity (Bance, 2007). In both countries, telecommunications reform resulted in total privatization and full legal liberalization of the sector. In practice, however, the former incumbents in both countries still enjoy high market concentration, particularly Telefónica, distorting competition (Clifton, Comín and Díaz-Fuentes, forthcoming). In the electricity sector, both countries implemented full entry liberalization and unbundling. In the UK, privatization was total, whereas, in Spain, it was deep, though electricity transmission remains in the public sector. Whilst competition has generally been introduced in the UK, the Spanish market has remained dominated by private regional monopolies³ (CEEP, 2010). Rather than full withdrawal from these services, the State took on the role as market regulator and supervisor (Majone, 1996) assuming overall responsibility for preserving citizens' rights as consumers to those services considered in the general interest. In Spain, the functioning of these markets is subject to legally-established public service obligations, which mainly refer to guaranteeing service universality and security of supply (CEEP, 2010). In contrast, in the UK, citizens' rights as consumers are not enshrined in a specific legal document, and there was confidence that these issues could be resolved by the market (Clifton, Comín and Díaz-Fuentes, 2005).

2.2. The challenge from behavioural economics

Through its competence in delivering the Single Market, the EC has substantial powers to implement bold reform across public infrastructure services such as telecommunications and electricity. These policies, based on a supply-side perspective, had as key objectives the promotion of market integration and the subsequent opening up to competition (Pelkmans, 2006). Following conventional neoclassical economic theory, citizens, recast as consumers, were conceptualized as *homo oeconomicus*, meaning that they were conceived as being as homogeneous, rational agents who would maximize their individual utility. As such, EC policy-makers assumed that benefits of introducing competition could be shared in similar ways by all (EC, 2004).

Behavioral economics, a newly emerging discipline, challenged this conception of rational, selfish individuals. This school was, in turn, influenced by the institutionalist school, which had traditionally constituted the main alternative to the conventional neoclassical approach (Hodgson, 1998). Institutionalism conceives individuals not as isolated elements, but as agents, whose behavior can be largely explained by their position in the social environment and by the socio-economic institutions around them, including interaction between individuals, the existence of common concepts, norms, values and customs (Wilbur and Harrison, 1978; Hodgson, 2000).

Whilst still maintaining many similarities with neoclassical economics, behavioral economics shares two core aspects with institutionalism: it incorporates insights from other scientific disciplines, particularly psychology; and it foregrounds the empirical reality of agents' behavior, rather than resting principally on theoretical formalizations (Berg, 2010). On these grounds, the existence of biases that may condition individual behavior are identified such as "bounded rationality", because of

³ RD 485/2009 and RD-Ley 6/2009 require, from 1 July 2009, that the Spanish electricity sector is open to competition. However, these changes have not yet had an impact on market performance.

overconfidence, inertia, extrapolation error or loss aversion, and “limited selfishness”, due to altruism, cooperation or inequality aversion (Mullainathan and Thaler, 2000).

Insights from behavioral economics can be particularly interesting when analyzing situations in which individuals’ decisions do not lead them to optimize their situation. A case in point is that the benefits of competition may not occur when consumers do not behave in perfectly rational and do not enjoy perfect information (Gans, 2005). On this regard, Kahneman and Thaler (2006) distinguished between “decision utility”, on which agents base their choices, and “experienced utility”, referring to the results obtained from these decisions. Combining insights from behavioral economics on bounded rationality and limited selfishness with institutionalists’ analysis of how the social environment influences consumers’ behavior, it could be derived that consumers will take heterogeneous decisions, and that not all consumers have the same capabilities to make consumption choices that lead them to maximize their own satisfaction.

To date, the evaluation of public infrastructure reform and regulation has scarcely applied these concepts. However, as Ceriani, Doronzo and Florio (2009) observed, analyzing consumer heterogeneity could be particularly useful in these sectors, due to ease of implementing price discriminations, and multiple uses of services, leading to very different demand elasticities. The EC (2008a and 2010) has already started to show an interest in the possibilities of behavioral economics for future improved implementation of the Single Market. At best, they envisage that a better understanding of citizens as consumers in the marketplace might help the formulation of specific, targeted consumer policies to facilitate certain categories of citizens take better consumption decisions (EC, 2008b; OECD, 2008).

3. Data and Methodology

There are two main empirical sources at hand when seeking to examine choices and attitudes of individuals when consuming public services: revealed preferences, information on observable choices made by individuals; and stated preferences, derived from subjective expressions of satisfaction with public services, based on opinions (Frei and Stutzer, 2002). Both options, taken alone, have various limitations, which have led to a debate about which is the best suited method of analyzing individual and social welfare. This article uses an innovative approach of using revealed and stated preferences together, as complementary sources, to evaluate reform in these sectors, as suggested by Fiorio and Florio (2008). This approach has already been successfully applied in other fields, in order to tackle the separate limitations of both revealed and stated preferences and take advantage of their different potential (Köszegi and Rabin, 2008; Whitehead *et al.*, 2008). However, this approach has not been applied to the evaluation of public infrastructure services regulation from the citizens’ perspective, with the only exception of Waddams Price *et al.* (2007), in an analysis confined to one sector and one country.

Revealed preferences are often understood as representing objective data, so most economic analysis has focused on these.⁴ Most of the studies that have used revealed preferences to evaluate public infrastructure services regulation are based on national Household Budget Surveys (HBSs), essentially, surveys disaggregating household expenditure by categories. In Spain, studies include Arocena (2003) and Duarte, Mainar and Sánchez-Chóliz (2010); and in the UK, Gómez-Lobo (1996), Burns, Crawford and Dilnot (1996), Waddams Price and Hancock (1998) and Bennett, Cooke and Waddams Price (2002). However, taken alone, revealed preferences do not permit observers to analyze behavioral aspects such as why a service is not used, or to understand how biases identified by behavioral economists lead to individuals not maximizing their utility. Moreover, public infrastructure service markets are not competitive, but quasi-markets, so exiting and switching supplier involve high costs for the citizen and, thus, consumption decisions may not always reflect their real preferences. In this way, Hirschman's exit-voice-loyalty framework (1970) is invoked, since voice, which can be evaluated using stated preferences, is also an essential element to consider. Once public infrastructure reform was set in motion, the EC executed *Eurobarometer* surveys specifically intended to analyze and keep a check on citizen satisfaction with these services. Some economic analysis, such as Clifton, Comín and Díaz-Fuentes (2005), Bacchiocchi, Florio and Gambaro (2008), Fiorio and Florio (2008 and 2009) and Clifton and Díaz-Fuentes (2010) have used these sources to examine citizen satisfaction with reform. Most of their results differ, in a large extent, from those theoretically expected regarding the effects of the reforms on citizens' satisfaction.

The evaluation of infrastructure reform from a consumer perspective is executed by contrasting examinations of revealed and stated preferences: firstly, the two data sources are analysed separately; next, they are contrasted. The theoretical advantage of combining stated and revealed preferences is to maximize the contrasting strengths of both approaches, whilst minimizing their weaknesses, thus aiming to enrich the interpretation of the data (Whitehead *et al.*, 2008: 876). The logic of the analysis follows Kahneman and Thaler (2006) who state that, in the decision-making process, individuals first make their choices, reflected in revealed spending patterns; they then obtain a degree of (dis)satisfaction with the price of that service, which is reflected in stated preferences. In order to derive hypotheses for testing, we reverse the order of these two steps to propose:

1. Citizens who are more vulnerable as consumers will be more dissatisfied than other citizens with service prices, as a result of the spending decisions they take in the markets and reflecting the particular problems they encounter in these markets.
2. Citizens who are more vulnerable as consumers make spending decisions which are distinct to those of other citizens.
3. The problems of citizens who are more vulnerable as consumers in the market are commonly observed in both countries and sectors under analysis.

Empirical analysis of the three hypotheses is addressed firstly by evaluating stated preferences. Sources used are the sub-samples corresponding to the

⁴ For an interesting debate on the objective/subjective nature of data on public sector performance, see the special issue edited by Van Dooren and Van de Walle (2008).

analyzed countries of the micro-data for the year 2006, from *Eurobarometer* (EC, 2007b). Dissatisfaction with service price is selected as the dependent variable, identified when the respondent states that the service is not “affordable”. In the case of telecommunications, information is disaggregated between fixed telephony, mobile telephony and the internet (which is the least-used service of the three). Because of this, two variables are considered: “dissatisfaction with the price of telephony”, which refers to dissatisfaction with the price of fixed or mobile telephony, and “dissatisfaction with the price of telecommunications”, referring to dissatisfaction with the price of one of any of these three services. For revealed preferences, data is derived from the micro-data for 2006 from the British and Spanish HBSs, namely, the Expenditure and Food Survey (ONS, 2006) and the Encuesta de Presupuestos Familiares (INE, 2006). From the information included in these surveys, the logarithm of household spending on electricity and telecommunications, expressed in euros per year, is taken as the dependent variable.

Following Burden (1998), it is assumed that there are two, sometimes, complementary, major reasons that citizens may be more vulnerable as consumers: firstly, because they may face greater difficulties to obtain and/or assimilate the information necessary to make consumption decisions; and, secondly, because they may experience a greater welfare loss due to inadequate consumption decisions, or for not consuming a good or service that would otherwise be in their interests to do. From here, Burden (1998) and OECD (2008) proceed to analyse vulnerable consumers by focusing on particular socio-economic characteristics of individuals. In this article, we select three major independent variables associated with citizens’ potential vulnerability in the market: employment (non-employed versus employed); age (the elderly versus the middle-aged and young) and education (low-educated versus better-educated). Control variables are household size and house ownership status and, in the case of revealed preferences, household income (from the equivalent total expenditure).

Regarding stated preferences, dissatisfaction with the price of services is analyzed represented by the binary dependent variable y , defined as:

$y = 1$, with probability p , if the individual i is unsatisfied with the price of the service.

$y = 0$, with probability $1 - p$, otherwise.

From this, we construct the following function, which relates the probability p previously defined with the vector of independent variables x :

$$p_i \equiv \Pr(y_i = 1 | x) = F(x_i' \beta) \quad (1)$$

Assuming that F follows a standard normal distribution function Φ , it is possible to estimate the probability of stated dissatisfaction with the price of each of the services from the following probit model:

$$\Pr(y_i = 1 | x) = \Phi(x_i' \beta) \quad (2)$$

We estimate also the marginal effects associated with each of the k independent variables as:

$$\frac{\partial}{\partial x_{ik}} \Phi(x_i' \beta) = \Phi(x_i' \beta) \beta_k \quad (3)$$

Thus, the effects of socioeconomic characteristics of individuals on their dissatisfaction with the price of services are estimated from the following expression:

$$\Pr(DISSAT_{ij} = 1 | x) = \Phi(x_i) = \Phi(Z_i^D) \quad (4)$$

Where:

$DISSAT_{ij}$ = probability that individual i is unsatisfied with the price of service j .

Where j = [electricity, telephone, telecommunications].

Z_i^D = vector of binary variables reflecting the individual characteristics derived from the Eurobarometer.

Regarding revealed preferences, for each of the services it is carried out the following linear estimation:

$$\ln(G_{ij}) = f(x_i) = f(Z_i^R) \quad (5)$$

Where:

G_{ij} = household i expenditure on service j , expressed in euros per year.

Where j = [electricity, telecommunications].

Z_i^R = vector of binary variables reflecting the characteristics of each household i , derived from the HBSs.

Both regarding stated and revealed preferences, and for electricity and telecommunications, separate estimations are conducted for both countries, using the sampling weights provided by the surveys, ensuring representative results in terms of the whole population.

Finally, in order to contrast the evidence obtained, as regards stated preferences, it is considered that dissatisfaction with service price is a direct function of two elements: the unit price paid (P); and a second, subjective element (V), which reflects the degree of pessimism in the perception, which can be derived by the respondent's level of confidence in the market. This is represented in the following expression:

$$\Pr(DISSAT_{ij} = 1) [0,1] = f(P_{ij}, V_{ij}) \quad (6)$$

For revealed preferences, spending on each service is analyzed also as a direct function of the unit price paid (P) and, in addition, of the amount consumed (X), reflecting the degree of participation in the market, according to the following expression:

$$G_{ij} = f(P_{ij}, X_{ij}) = P_{ij} X_{ij} \quad (7)$$

From the two relationships described, it becomes possible to interpret the effects estimated regarding the dependent variables under analysis as a result of differences in P , V and/or X and, thus, reflecting particular problems in the market.

4. Evaluating public infrastructure services from the citizens' perspective: Results

The estimated marginal effects of the independent variables analyzed on stated dissatisfaction with service price are shown in Table 1. In the case of electricity, the variables representing citizens' vulnerability as consumers (employment, age and education) hardly show any significant effects on price dissatisfaction. In Spain, 65-year olds and over are slightly more dissatisfied than others, but in the UK, dissatisfaction is independent of age. Dissatisfaction among the employed and non-employed is similar in both countries. In the case of education, there are, again, no significant differences across the two countries, with the minor exception of the UK where there is a weakly significant effect associated with an intermediate educational attainment.

Table 1. Marginal effects estimated on dissatisfaction with electricity and telecommunications prices

	Variable	Electricity		Telephony		Telecommunications	
		UK Marg. Eff.	Spain Marg. Eff.	UK Marg. Eff.	Spain Marg. Eff.	UK Marg. Eff.	Spain Marg. Eff.
Employment	NOTEMPLOYED	0.036	-0.020	0.081**	0.107***	0.092**	0.067*
Age	<35	0.036	-0.011	0.031	-0.046	-0.008	-0.072
	50-64	0.007	-0.018	0.042	-0.005	0.118**	-0.018
	65-74	0.070	0.125*	0.133**	0.175***	0.303***	0.163***
	>74	-0.024	0.182**	0.295***	0.286***	0.445***	0.214***
Education	HIGHSECOND	0.049*	0.037	-0.032	-0.061	-0.067*	-0.094**
	UNIVERSITY	-0.033	-0.041	-0.099**	-0.129**	-0.157***	-0.214***
Control	1PERSON	0.014	0.069	0.125***	-0.010	0.136***	0.020
Variables	3PERSONS	0.057	0.009	0.022	-0.105**	0.018	-0.068
	4PERSONS	0.085*	0.093**	-0.049	-0.024	-0.090	-0.063
	>4PERSONS	0.027	0.006	0.059	-0.105*	0.026	-0.097
	NOHOUSEPROP	0.005	0.158***	0.149***	0.203***	0.166***	0.145***
N		1337	1006	1337	1006	1337	1006
Wald chi2		20.46	34.29	125.57	111.03	200.99	105.32
Prob > chi2		0.059	0.001	0.000	0.000	0.000	0.000

* Significance level at 10%, ** significance level at 5%, *** significance level at 1%

Source: Own calculations based on EC (2007b).

In contrast, in the case of telecommunications, all the variables representative of citizens' vulnerability as consumers are significantly related to price dissatisfaction, independent of the indicator selected (price of telephony or price of

telecommunications). Furthermore, all these effects show the same direction in both countries. So, those not employed express greater dissatisfaction than the employed in the UK and Spain. As regards age, there are higher dissatisfaction rates for the 65 year olds and over in both countries: disaggregating the services, the elderly are particularly dissatisfied with both mobile telephony and internet. Those over 75 years old are even more dissatisfied than those between 65 and 74. Finally, educational attainment is inversely related to price dissatisfaction in both countries. When considering the price of telephony, those without university education are less satisfied than graduates. For the price of telecommunications, those who did not finish secondary school show particular dissatisfaction.

Next we turn to examining correspondence between the estimated effects of these variables on revealed service expenditure. Results are shown in Table 2. Starting with expenditure on electricity, the control variables show significant effects in both countries. The variables representing citizens' vulnerability as consumers are also related, in general, to expenditure on this service. Age is directly related to electricity expenditure in both countries, especially in the UK. Regarding employment status, households without any employed member are associated with higher spending in Spain, although not in the UK. Moreover, the less-educated spend more on electricity in Spain, but less in the UK. One possible explanation for this cross-country difference is that a "Social Action Strategy" was introduced into the UK from 2000 in order to alleviate problems of "fuel poverty" even though Bennett, Cooke and Waddams Price (2002) argued issues of "fuel poverty" were not eliminated. Our previous results for stated preferences in Table 1 showed the absence of significant relationships between these variables and price dissatisfaction. It follows that they are also not related to P and V , the two elements into which price dissatisfaction can be decomposed. In this case, the estimated effects of variables representative of vulnerability on spending on electricity can be interpreted, as those related to the control variables, mainly as a result of the differences in the amount of service consumed (X). As an exception, the elderly in Spain were observed to be more dissatisfied with electricity prices, corresponding to their higher spending on the service.

For telecommunications, those variables associated with consumer vulnerability, already shown to be significantly related to price dissatisfaction, were also seen to be related, in general, to spending. In both countries, the elderly spend more on telephone services: disaggregating this, they spend much more on fixed telephony, much less on mobile telephony and even less on internet services. Thus, controlling for income, employment status, education, household size and so forth, the elderly use fixed telephony services more intensively, rather than using alternative communications services. This behaviour would seem to be best explained by inter-generational lags and inertia vis-à-vis the take-up of the new technologies, reinforcing evidence of consumer heterogeneity. Elderly people's dissatisfaction with these two services is linked to their lack of participation in these markets: many may use fixed telephony to make expensive connections to mobile telephones, for instance. For sure, their spending decisions do not lead them to optimise their savings, thus minimise their own dissatisfaction.

As regards employment status, those households with no employed member and, to a lesser extent, households with one employed member, spend less on

telecommunications in both countries, which can be explained by their negative perceptions about affordability. Finally, with regard to education, lower levels of education are associated with lower spending on telecommunications in Spain, though not in the UK. Simultaneously observed higher levels of dissatisfaction and lower spending on telecommunications among the household with no employed members, and, in Spain, also among the lower-educated, are interpreted necessarily as being derived from a more pessimistic perception (V) and/or lower amount consumed of the service (X), apart from possible differences in the unit price (P). Consequently, the combined evidence indicates that citizens face problems in the telecommunications markets, reflected in lower confidence (linked to the higher V) and/or lower participation (related to the lower X). In the case of lower-educated in the UK, the problems reflected by higher dissatisfaction can be interpreted as being derived from V , although differences may also exist in P and X .

Table 2. Effects estimated on spending on electricity and telecommunications

		Electricity		Telecommunications	
		UK	Spain	UK	Spain
		Coeff.	Coeff.	Coeff.	Coeff.
	Constant term	-0,909*	-2,170***	-0,352	-3,900***
Employment	ONEEMPLOYED	-0,002	0,031	-0,158***	-0,157***
	NONEEMPLOYED	-0,123	0,160***	-0,447***	-0,325***
Age	RP <35	-0,016	-0,115***	-0,013	0,044
	RP 50-64	0,435***	0,073***	0,030	0,220***
	RP 65-74	0,759***	0,114***	0,148*	0,227***
	RP >74	1,002***	0,105**	0,270***	0,243***
Education	RP HIGHSECOND	0,076	-0,057**	-0,010	0,132***
	RP UNIVERSITY	0,187***	-0,137***	0,018	0,171***
Control variables	NMEMBERS	0,221***	0,365***	0,353***	0,508***
	NMEMBERS2	-0,004	-0,023***	-0,022***	-0,033***
	NOHOUSEPROP	-0,784***	-0,281***	-0,159***	-0,156***
	InSPENDequiv	0,613***	0,757***	0,616***	0,932***
N		6645	19435	6645	19435
F		52,97	387,65	85,09	369,80
Prob > F		0	0	0	0

RP = Reference Person

* Significance level at 10%, ** significance level at 5%, *** significance level at 1%

Source: Own calculations based on INE (2006) and ONS (2006).

5. Conclusions

Results obtained are now applied to address the three hypotheses. The first stated that those citizens more potentially vulnerable as consumers would express higher levels of dissatisfaction with these services. In the case of telecommunications, it was shown that those not working, the elderly and the lower-educated, were indeed more dissatisfied with prices. Our findings coincide with the study by Bacchiocchi, Florio and Gambaro (2008) on satisfaction with fixed telephony

in the EU-15 between 2000 and 2004, the main difference being that, in our contribution, mobile and internet communications were also included. Including these two new technologies turned out to be important, as some of the most vulnerable of consumers, the very elderly, are sharply dissatisfied particularly with them. It seems that a combination of issues including affordability but also inter-generational difference help explain greater reluctance to use these new communications services. In contrast, for electricity, no significant associations were found between vulnerable consumers and price dissatisfaction in the two countries selected in 2006. Other research, such as Fiorio and Florio (2008), had found that the unemployed and less-educated were more dissatisfied with electricity prices, whilst the very elderly were more satisfied, in the EU-15 over the period 2000 to 2004.

The second hypothesis posited that those more vulnerable as consumers would make different spending decisions than other citizens. On contrasting stated and revealed preferences, different interpretations can be derived from the evidence. For telecommunications, the most vulnerable citizens expressed high levels of dissatisfaction which was associated with their different spending decisions. In the cases of those who do not work and lower-educated people, high dissatisfaction is related to their lower levels of confidence and/or lower participation in the market. As regards the elderly, this category reveals differences when taking decisions about spending on mobile and internet communications. Decisions to spend instead on more on traditional, fixed telephony are associated with their high dissatisfaction levels with the alternative services. In contrast, for electricity, the differences observed are derived, in general, from differences in the amount consumed, as there are very few significant effects on dissatisfaction with the price. Finally, in relation to the third hypothesis, which posited that the problems exhibited by people in socio-economic categories associated with vulnerability would be similar across the two countries, this was found to be generally correct for telecommunications, whereas the evidence on electricity was more heterogeneous.

The findings reinforce a basic observation: common policy reforms and regulation can have different effects on citizens, as they are heterogeneous, and do not necessarily behave in a uniform and rational manner. On entering the market, individuals do not have the same capacity or social environment to enable them to maximize their satisfaction. Citizens, as suggested by institutionalists, have different social, cultural and cognitive backgrounds. They are conditioned by their different social and relational environments, and this influences the processes of decision-making. Certain socio-economic groups, therefore, may be particularly vulnerable as consumers.

The findings are significant from the perspective of policy-makers. Public infrastructure service reform and regulation were designed from the supply-side, and little or no attention was paid to citizens' heterogeneity as consumers. The central issue is that, in the absence of compensatory regulatory policies, these reforms can have a negative impact on public service obligations, including issues of service universality and affordability. Worse still, it is, in general, those individuals who are potentially vulnerable in the market who may find their vulnerability increases. Given the EC holds that services such as electricity and telecommunications are key to ensuring equity, solidarity and social cohesion (EC, 2007a), the task of enquiring how reform of these sectors affects certain socio-economic groups associated with

consumer vulnerability is an important one for the future evolution of public policy in the European Union.

Two final observations are made. Firstly, findings obtained reaffirm the need to continue to redefine EC regulatory policies in these sectors, particularly by incorporating better insights on consumer heterogeneity in the design, implementation and evaluation of policy. Already, in recognition of the emergence of new issues as a consequence of the reform of public infrastructure services, some new regulation and programs have been implemented by governments and firms targeting consumers in particular socio-economic groups. In the UK, in the electricity sector, the electricity and gas regulator, OFGEM, launched a “Social Action Strategy” from 2000, in response to emerging evidence on problems such as unaffordable energy prices to the most vulnerable (OFGEM, 2010). The British government has offered “Cold Weather Payments” during periods of particularly cold weather for those on low incomes. In the telecommunications sector, the ex-incumbent, BT, launched a service called “BT basic” from 2008, offering low-cost rental lines with restricted calls, to the unemployed and pensioners. In Spain, the National Commission of Energy (CNE) offered, in 2010, a “social voucher” to consumers considered vulnerable, effectively maintaining 2009 prices, whilst they increased by 10 per cent for the rest of the population (CNE, 2010). A “social voucher” was also established by the Telecommunications Market Commission (CMT, 2010) for the lowest-income pensioners from 2007. Telefónica, Spain’s ex-incumbent, also offered discounts on mobile telephone bills to the unemployed during 2009 and 2010, with the aim these consumers would continue to use the service during the crisis (discontinued in October 2010). Secondly, it can be envisaged that the problems vulnerable consumers face in the public infrastructure markets will increase. Telecommunications, where the clearest evidence was seen on higher rates of dissatisfaction associated with vulnerable consumers, is also the sector where reform has most advanced. It is possible that, as reform has advanced in electricity, gas, water and so on, beyond the year analysed here, 2006, similar issues will be reinforced. Future lines of research could evaluate to what extent these new regulatory policies and social programmes succeed in ameliorating the way in which public infrastructure reform has appeared to have negative effects on the most vulnerable of consumers.

6. References

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