

Abstract

Due to the intense market-oriented reform introduced during the last decades, particularly in the EU context, public infrastructure services have experienced deep recent changes in their modes of organisation and regulation. A key aim of market-oriented reforms was to introduce competition and further opportunities for choice, which was expected to increase citizens' satisfaction in their role as consumers. Nevertheless, the regulation of these markets after the reforms has proven to be more complex than first thought, whilst significant problems from the perspective of consumers have been detected. In this light, international organizations and regulators and policy makers are paying increasing attention to the new insights on consumer behaviour derived from Behavioural Economics. Regulators and policy makers are considering how a deeper understanding of consumers' behaviour may be translated into specific regulatory policies from the consumer perspective, as a complement to the more traditional competition policies, aiming to improve consumers' well-being and satisfaction. In this context, a crucial concern is whether, due to the increasing complexity of the markets, certain groups of consumers (the so-called "vulnerable consumers") may be at a disadvantaged position for taking satisfactory consumption decisions in the market place. However, further empirical evidence is required on the relation between consumers' socioeconomic characteristics, behaviour and satisfaction, aiming at establishing which kind of regulatory policies may be applied and, in case, in which markets and socioeconomic dimensions they should focus.

The objective of this paper is to analyse the differences in consumers' decisions and attitudes in the markets of public infrastructure services, focusing on three socio-economic dimensions representative of potential vulnerability: education, age and employment. To this aim, this paper contrasts information on citizens' revealed preferences (expenditure decisions), obtained from national Household Budget Surveys, and stated preferences (satisfaction with price), obtained from the last Eurobarometer on Services of General Interest. The paper focuses on two essential services (electricity and telecommunications) and on three different large European countries (Italy, Spain and the UK) where comparable information is available. The results obtained show that, for some of the services and socioeconomic dimensions under analysis, potentially vulnerable consumers exhibit particular difficulties for satisfactory decision making, reflected in lower satisfaction associated to different expenditure decisions. However, the characteristics of the service and other contextual factors also demonstrate to play a significant role for explaining the distinctive features observed. Insights from Behavioural economics provide a useful base for interpreting these results. The empirical evidence obtained from this paper, combined with a Behavioural economics approach, permits to obtain some clear recommendations for improving results of regulation from the point of view of consumer satisfaction, by focusing on incorporating citizens' heterogeneity as consumers.

1. Introduction

From the 1980s and mainly during the 1990s, public infrastructure services (such as electricity, water, telecommunications and transport), have been subject to deep reforms in the European Union (EU) countries (Clifton *et al.*, 2007). In the previous decades, these services experienced a long period of stability in their organisation and regulation in Western European countries, where the dominance of public monopolies in their provision was justified by the existence of market failures, reasons of social justice and their strategic nature (Comín and Díaz-Fuentes, 2004). The recent reforms, strongly driven by the process of European integration (Bauby, 2008), consisted on the liberalisation and deregulation of these services (in most cases accompanied by their privatisation), supposing a deep change in their organisation and regulation. These reforms aimed to benefit citizens in their role as consumers through the introduction of market-based solutions (EC, 2004). Based on the neoclassical economic conception of citizens as rational and selfish consumers (*homo oeconomicus*), liberalisation and deregulation would led to higher competition levels, and thus more choice, so rational and selfish consumers would be able to take better decisions in the markets and obtain higher satisfaction.

Despite this theoretical aim, paradoxically, the reforms and the subsequent regulation of these markets have been insufficiently analysed from the perspective of citizens as consumers (Fiorio and Florio, 2008; Clifton *et al.*, 2011). From the beginning, there were concerns about whether the persecution of market-driven objectives will have a negative impact on public service obligations as universality, affordability, quality and their role in strengthening social and territorial cohesion (Clifton *et al.*, 2005 and 2011). In the EU context, these are key elements in the provision and regulation of these services, given their role of Services of General Interest (Van de Walle, 2009). More recently, the emergence of alternative economic approaches to the economic behaviour of citizens as consumers (in particular, those derived from Behavioural economics) has led to increasingly recognise the insufficiencies of traditional regulatory policies to improve citizens' satisfaction towards these services. At present, regulators of the main developed countries (Australian Government, 2007; Federal Trade Commission, 2007; Institute for Government, 2010), international institutions as the OECD (2008 and 2010), and particularly the European Commission (EC, 2008, 2012 and 2013) are considering how new evidence on consumers behaviour can impact on an improvement of the results of regulation on consumers' well-being and satisfaction. Recent empirical evidence is questioning if citizens with certain socio-economic characteristics can be equally well positioned than others to deal with challenges brought about by deregulation (OECD, 2008; Clifton *et al.*, 2011; Jilke, 2013), as the amount of choice and complexity of information in the markets. In this context, governments and regulators are paying increasing attention to "vulnerable consumers" (OFT, 1998; OECD, 2008; George *et al.*, 2011; EP, 2012; Clifton *et al.*, 2014), a notion which, as explained in detail in section 2, is referred to those "at a disadvantage in exchange relationships where that disadvantage is attributable to characteristics that are largely not controllable by them"

(Andreasen and Manning, 2010). But at present, a lack of empirical evidence on the relationship between consumers' socioeconomic background and their behaviour and satisfaction with public infrastructure services remains, constituting a significant policy and academic concern for evaluating and improving the functioning of these markets and their regulation after their deep reforms.

The objective of this paper is to analyse public infrastructure services and their regulation from the perspective of citizens as consumers, from empirical evidence on how three key socioeconomic characteristics representative of potential vulnerability (employment, age and education) impact on their behaviour and results in these markets. By this empirical evidence, combined with insights from Behavioural economics, this paper aims to obtain recommendations for improving effectiveness of regulation from the point of view of consumers' satisfaction. To do so, as explained in section 4, two different sources of information are contrasted through a microeconomic analysis: citizens' consumption decisions (revealed preferences), from national Household Budget Surveys (INE, 2006; ISTAT, 2006; ONS, 2006), and their satisfaction with price (stated preferences), from the last Eurobarometer on Services of General Interest (EC, 2007). Two sectors object of recent deep, although heterogeneous, reforms in the EU countries are analysed: electricity and telecommunications. The paper is focused on three large European countries where comparative information is available: the UK, Italy and Spain. All of them have introduced deep market-oriented reforms in these services, although with significant differences in their starting point, sequence and extent: the UK was an early mover and paradigm of these reforms, whilst it has been also pioneer in developing specific policies addressed to vulnerable consumers; Italy was a representative case of the traditional regulatory regimes in continental Europe, but has also recently moved towards market-oriented reform; so has done Spain, which has been traditionally characterised by relatively high levels of privatisation, but not of liberalisation.

The results obtained show how the social environment and the social context, represented by socio-economic characteristics, condition the decisions taken by citizens as consumers in the markets, and thus influence on the satisfaction they obtain. It is also observed that, in some cases, those citizens with socio-economic characteristics particularly associated to potential vulnerability, commonly associated to lower social, cultural and economic resources (and thus with lower means and capacities for decision making) frequently obtain poorer results. The characteristics of the service, the context of the country and other contextual factors also play an important role. Insights on consumers' decision making obtained from Behavioural economics are useful for interpreting these results, as the higher risk of difficulties for accessing and analysing the information for the less educated, of experiencing the *status quo* bias for the elderly or of suffering higher loss aversion for them and for those not employed. These results reflect how both the design and the evaluation of public infrastructure services regulation need to incorporate empirical evidence on citizens' heterogeneity as consumers combined with a Behavioural economics approach, further than the simplistic idea of homogeneous rational and selfish consumers, if aiming to improve their results in

terms of consumer satisfaction and social cohesion.

The paper is organised as follows. After this introduction, the second section describes the challenges for public infrastructure services regulation posed by their deep reforms, and the recent approaches based on an increasing attention to the consumer perspective. The third section summarises the reforms experienced by electricity and telecommunications in the three countries under analysis. The fourth section presents the sources of information used and the empirical approach. The fifth section describes the results obtained from the estimations and interprets them according to a Behavioural economics approach. The sixth section concludes, from the discussion of the results, providing some recommendations for public infrastructure services regulation.

2. Regulating from the citizens' perspective after services reform

Public infrastructure services reforms in the EU countries aimed to promote markets integration and their openness to competition as a key objective for the forging of the European Single Market (Clifton *et al.*, 2006). These reforms were designed from the supply-side, justified on the grounds that they would increase the efficiency of services provision, by the introduction of competition to activities which had, for decades, been generally shielded from market forces. Economists and policy-makers alike in favour of these reforms insisted that their benefits would filter downwards to citizens in their role as consumers. This approach was based in the neoclassical view of consumption: individuals, as rational and selfish agents maximizers of their own individual utility (*homo oeconomicus*), would make an appropriate use of the possibilities of choice generated by the introduction of competition in markets, following their privatisation and deregulation (EC 2004, OECD 2009). It could be supposed that, as a logical consequence, consumer satisfaction and social welfare would improve (Newbery, 2001).

However, experience has not reflected evidence of more optimal market functioning for consumers (Cseres, 2008). After the initial period of optimism about the benefits of reform for citizens as consumers, regulators and policy-makers became concerned that public infrastructure regulation after reform was proving more complex than first thought, largely because of the characteristics of the services themselves (Estache, 2006). Consumption of services provided by public infrastructure services became more complex as the potential benefits of reform, such as choice, were extended. Services provided by public infrastructure services are usually classified as either being “experience” or “confidence” goods (Sappington, 2005). Experience goods refers to the fact that consumers may be unable to discern the level of quality of a good or service until they have tried them (telecommunications are a case in point). Confidence goods are more complex in that, even after consumption, consumers lack full information to be in a position to wholly assess

their quality. In services as gas, electricity and water, consumers will know if supply is reliable, continuous and of a basic quality but, beyond this, cannot judge service quality, potentially leading to moral hazard issues. Interestingly, consumers have been evoked as an agent of regulatory change on the basis of the logic of Hirschman's Voice/Exit/Loyalty model (Hirschman, 1970). If, under the post-war configuration of public infrastructure services organisation, the "exit" option was not possible due to the lack of an alternative provider, competition would unlock the door allowing exit in the direction of an alternative provider. Once exit was possible, however, solely providing choice in the market was inadequate, as consumers needed to be activated to take decisions about their consumption. Active consumers would therefore help facilitate "disciplining" the market (Armstrong and Sappington, 2006). And consumers' "voice" also need freeing up and channelled, often through consumer satisfaction surveys.

Soon, once results on satisfaction for the 1990s and 2000s were published and analysed, it became increasingly clear that satisfaction results were not necessarily on an upward trend as reform advanced and was consolidated in the EU countries (Clifton *et al.*, 2005; Clifton and Díaz-Fuentes, 2010; Fiorio and Florio, 2011; Bacchiocchi *et al.*, 2011). In this light, the EC has begun to recognise the insufficiencies of the regulation from the supply-side perspective (competition policies) alone, and is looking for new and complementary ideas based on the consumers' perspective. A first step in recognising this problem was that, in 2008, and again in 2010, high-level international conferences were organised in Brussels by the European Commission (EC) on how specific regulation from the consumer perspective can be implemented to improve the functioning of these markets in the light of this evidence on satisfaction. Though these conferences tackled consumer satisfaction with services and goods more broadly, discussion about satisfaction with public infrastructure services was a dominant theme. Agreement was reached among invited representatives than, though the reform of public infrastructure services from the 1980s onwards had met with partial success, the newly emerging lessons that could be drawn from Behavioural Economics, a renewed "bottom-up" approach to regulation might well facilitate positively influencing consumer behaviour towards, use of and satisfaction with public infrastructure services.

The emergence of Behavioural economics questions the notion of *homo oeconomicus* in which the reforms of public infrastructure services were based. This emerging discipline focuses on the mechanisms that, through their impact on human behaviour, empirically contradict the assumptions of complete rationality and selfishness, leading to bounded rationality (as overconfidence, inertia, extrapolation error and loss aversion) and limited selfishness (as altruism, cooperation and aversion to inequality) (Kahneman *et al.* 1991, Mullainathan and Thaler 2000, Schwartz 2007). In the early development of Behavioural Economics, it had a great influence the institutionalist school (Hodgson 1998). This view considers that individuals' behaviour is prominently influenced by different elements of their social context and environment, derived from those socioeconomic institutions (understood in a broad sense) in which individuals are embedded (as the interaction of economic agents, the

existent common concepts and habits and the set of values inherent to the institutions) (Wilbur and Harrison 1978). The emergence of views of consumption alternatives to conventional neoclassical has a particular interest for the analysis of situations in which it is not observed that individuals' decisions lead to their own optimal situation. From connecting the limits of agents' rationality and selfishness, derived from Behavioural Economics, with the emphasis of the institutional view on the incidence of social context and environment in consumers' decisions, it can be derived that all citizens do not have the same ability to make consumption choices that lead them to maximize their own satisfaction, as suggested by Clifton *et al.* (2011). Public infrastructure services reforms and their subsequent regulation have not consider citizens' heterogeneity as consumers, despite being, as pointed by Ceriani *et al.* (2009), a key element for the analysis of these services.

The insights derived from Behavioural economics have generated great interest among regulators and policy makers, specifically in the EU (EC 2008 and 2010), who is considering new specific regulatory policies from the consumer perspective as a complement to traditional regulatory policies from the supply-side. In fact, as pointed by Gans (2005), the benefit of competition on consumers' welfare may not take place if they are not perfectly rational or they do not have perfect information. Following Armstrong and Sappington (2006), policies that help to ensure consumers are well informed and able to switch their service provider (for instance, by improving the information available and by reducing the costs they incur when switching) would be the best means to stimulate competition. In a similar spirit, European regulatory policies have begun to focus also on ensuring that citizens, in their role as consumers, have the information and power they need to take adequate decisions in the markets, aiming at enhancing their confidence and dynamism, and thus their competitive performance (EC 2008). Thus, empowering consumers in the market is becoming a key issue for the EC regulatory policies, by improving information and education, raising awareness of consumer rights and building knowledge and capacity for more effective participation in the market (EC, 2012).

For this purpose, the EC is interested in deepening the understanding of the needs and motivations behind decisions and perceptions of citizens as consumers and in incorporating this into regulation (Clifton *et al.*, 2014). To this aim, it remains the important question of whether all consumers would be equally well-positioned to take advantage of the new environment after public infrastructure services' reform (Clifton *et al.*, 2011; Jilke, 2013). Consumers' social, cultural and economic environment may influence behaviour, leading to potentially heterogeneous outcomes. Bearing in mind the contextual factors which may influence the decision-making process (Institute for Government, 2010), it could be possible that belonging to certain socio-economic groups could be at a disadvantage in the market, which in that case may difficult these consumers to benefit from services reform. In this light, special attention has begun to be paid to those citizens potentially more vulnerable as consumers (OFT, 1998; OECD, 2008; EP, 2012), in line with the definition by Andreasen and Manning (1990). According to the British Office of Fair Trading (OFT, 1998),

consumers' vulnerability can be derived from experiencing higher difficulties to obtain and/or assimilate the information required for decision making, or from being to a higher risk for their own welfare associated to inadequate consumption decisions. Understanding what vulnerability is, to which factors it is related and to what extent it could imply acquiring certain disadvantages is a crucial aspect in the case of public infrastructure services, given their key social role and the deep market-oriented reforms they have recently experienced, leading to an increasingly complex environment for decision-making (Stern, 2012).

Vulnerable consumers do not constitute a separate section of the population. Instead, there is a range of multidimensional factors which contribute to the risk of vulnerability, which may result in barriers for people in obtaining information, advice and support, increasing the risk of experiencing difficulties when dealing with the markets (George *et al.*, 2011). As it is not directly observable, vulnerability is usually analysed through those socioeconomic variables of citizens that may render them potentially vulnerable as consumers (OFT, 1998; OECD, 2008; George *et al.*, 2011). Analyses commonly include as proxies of potential vulnerability socio-economic conditions as the age (both the elderly and minors), low income, unemployment, to have any disability, a low level of educational attainment, being part of an ethnic minority and living in rural areas. However, although these factors can increase the risk of consumer vulnerability, it may vary from market to market (OFGEM, 2012), as well as from changing personal circumstances over time (Stern, 2012)

George *et al.* (2011) and Stern (2012) have documented the barriers experienced by vulnerable consumers in public infrastructure service markets. Commonly, they are derived from information difficult to understand (for instance, due to complexity, lack of transparency or lack of access to internet), and problems when switching, in many cases leading to a weaker deal. Thus, vulnerability may lead to “disempowered consumers” (EC, 2012), as opposed to the “empowered consumers” aimed by the European regulatory policies. Until the moment, European law and regulatory policies have been based on the notion of the “average consumer”: the consumer who is reasonably well informed, observant and circumspect. However, this notion may not correspond to the reality of the majority of citizens as consumers. For this reason, the group representing the interest of consumers claims that policy initiatives should take into account the different needs of individuals according to their particular conditions or vulnerabilities (ECCG, 2013). Thus, this debate constitutes a key motivation for the approach adopted in this paper.

3. Public infrastructure services reform in the countries under analysis

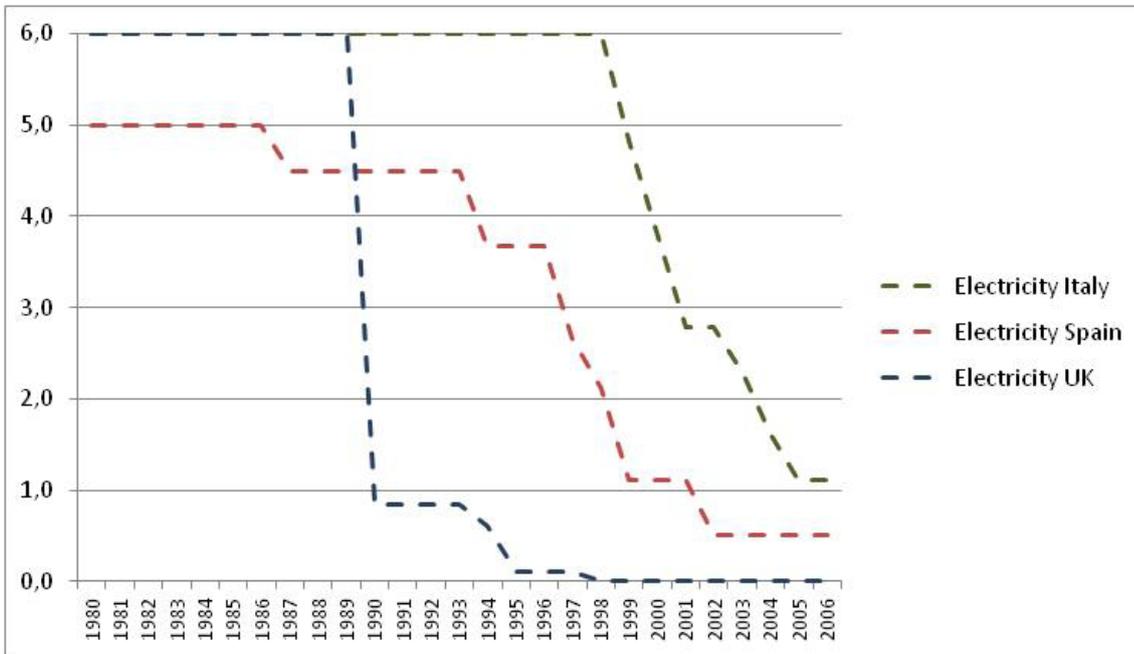
Commonly, all the three countries under analysis have recently introduced market-oriented reforms in electricity and telecommunications services. Nevertheless, remarkable differences exist

in the starting point and the approach adopted in this process (Clifton *et al.*, 2007). The UK was pioneer in these reforms in the 80s, during the Thatcher governments. Italy and Spain address the bulk of market-oriented reform of these services later, during the 90, following the EU directives on this regard. Also significant differences between services exist: whilst reforms in telecommunications were rapid and deep, energy reforms were more halting (Newbery, 2001). From information collected by Conway and Nicoletti (2006), the evolution of these reforms is summarised in figures 1 (for electricity) and 2 (for telecommunications). According to this source, for each country and service, sectoral indicators are defined as a weighted index, taking value between 0 (for the maximum level of reform) and 6 (for the minimum level of reform). Table 1 provides further detail on the content of the reforms under analysis, by disaggregating the sectoral indicators into their sub-components (regulation of entry, public ownership and vertical integration for electricity and market structure for telecommunications), for three different time moments between 1980 (prior to the reforms) and 2006 (the time of data collection as regards the sources available for this paper).

Prior to reform, as shown in table 1, electricity service was both in the UK and in Italy organised as a public monopoly, with entry regulation and vertical integration. In Spain also entry regulation and vertical integration existed, whilst the distinctive feature was a significant role of private sector in the property of the providers (established as private regional monopolies). As also observed in figure 1, the UK was pioneer in applying market-oriented reforms to this sector, nearly completing them by mid 1990s. In Italy and Spain, the bulk of electricity reform was undertaken at the mid and at the end of the 1990s, respectively. After the reforms, commonly in the three countries under analysis, electricity is characterised by absolute deregulation of entry and vertical disintegration. Privatisation is total in the UK, whilst public ownership maintain certain role in Spain (limited to the transmission grid) and particularly in Italy (CEEP, 2010). As another distinctive feature, in the UK real liberalisation of the market is higher, operating as a competitive market. However, in Spain and Italy, in practice competition levels are low and consumer real choice hardly exist in both countries.

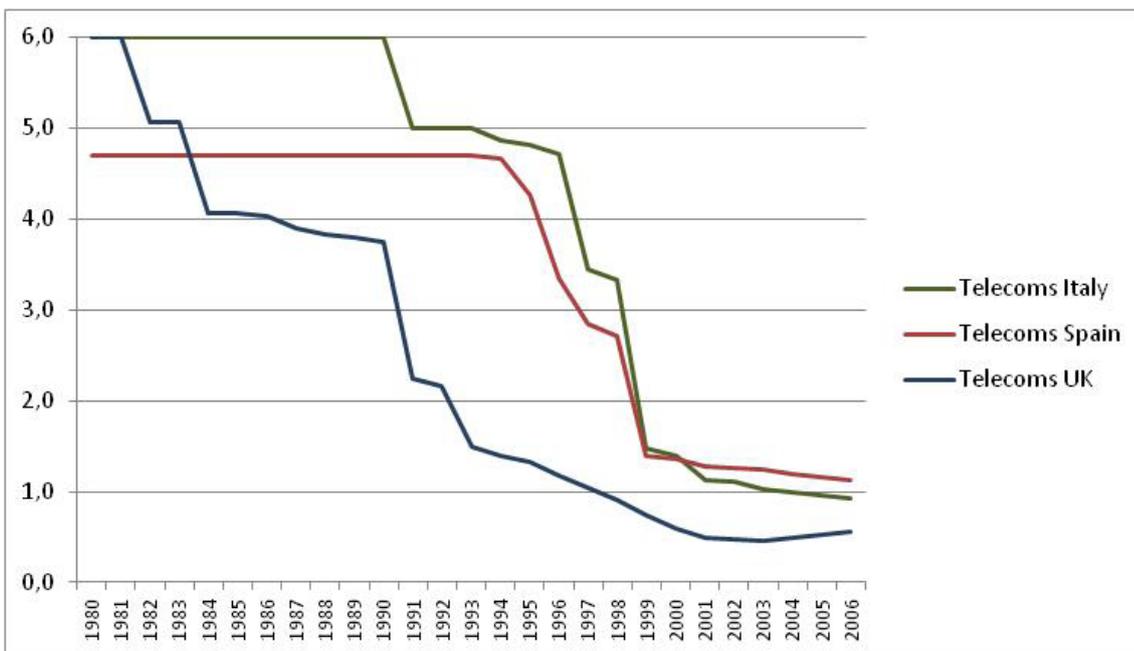
For telecommunications, as observed in table 1, situation in the beginning of the 80s was similar to that described for electricity: dominance of a public monopoly, with entry regulation in the UK and Italy, and the distinctive higher participation of the private sector in the ownership of the incumbent in Spain (in this case, a national monopoly). As also observed in figure 2, the UK initiated the market-oriented reform of the service in the 80s, nearly completing it by the beginning of the 90s. In the mid 90s, Italy and Spain also undertook deep market-oriented reform of telecommunications. After this process of reforms, commonly in the three countries under analysis public ownership in the sector is non-existent, whilst the market is fully liberalised from the normative point of view. However, as reflected in the market structure, in practice remarkable market concentration remains, particularly in Spain and Italy, leading to oligopolistic markets (CEEP, 2010).

Figure 1. Electricity reform in the countries under analysis



Source: Conway and Nicoletti (2006)

Figure 2. Telecommunications reform in the countries under analysis



Source: Conway and Nicoletti (2006)

Table 1. Public infrastructure services reform in the countries under analysis

ELECTRICITY	ITALY			SPAIN			UK		
	1980	1993	2006	1980	1993	2006	1980	1993	2006
Entry	6,0	6,0	0,3	6,0	6,0	0,0	6,0	1,0	0,0
Public ownership	6,0	6,0	3,0	3,0	3,0	1,5	6,0	1,5	0,0
Vertical integration	6,0	6,0	0,0	6,0	4,5	0,0	6,0	0,0	0,0
Sector indicator	6,0	6,0	1,1	5,0	4,5	0,5	6,0	0,8	0,0

TELECOMM.	ITALY			SPAIN			UK		
	1980	1993	2006	1980	1993	2006	1980	1993	2006
Entry	6,0	6,0	0,0	6,0	6,0	0,0	6,0	0,0	0,0
Public ownership	6,0	3,0	0,0	2,1	2,1	0,0	6,0	0,1	0,0
Market structure	6,0	6,0	2,8	6,0	6,0	3,4	6,0	4,4	1,7
Sector indicator	6,0	5,0	0,9	4,7	4,7	1,1	6,0	1,5	0,6

Source: Conway and Nicoletti (2006)

Market oriented reform of public infrastructure services in Italy, Spain and the UK permitted the governments to alleviate pressures on public budgets via revenues derived from privatisation (Millward, 2007; Toninelli and Vasta, 2007). However, it is not clear how these reforms have affected citizens as consumers, those who theoretically the reforms aimed to benefit. After market-oriented reforms, the public sector has lost most of its role in direct provision of electricity and, especially, telecommunications services in these countries. However, the provision of these services remain subject to the general interest, and thus the public sector maintain a key role as market regulator and guarantor of those rights of citizens as consumers which, in each case, are established as objectives of social interest (Clifton *et al.*, 2007).

As described in CEEP (2010), in Italy, public infrastructure services, including electricity and telecommunications, have been traditionally included under the concept of “public service” (*servizio pubblico*). This concept encompasses an active role of the public sector in the regulation of these services, under the principles of equity and solidarity, quality of services, users’ protection and guarantee of information and participation. From this tradition, regulation establishes that competition in these markets must not undermine general interest. In Spain, an analogous concept of “public service” (*servicio público*) traditionally existed. Both in Italy and Spain, the concept of “public service” has been progressively substituted by those derived from EU terminology in the

regulation of the services under analysis. At present, the functioning of these markets is subject to Public Service Obligations, as Services of General Economic Interest, particularly referred to guarantees of universality and security of supply. At the same time, regulatory priorities have progressively changed to productive efficiency. Nevertheless, in both countries, based on principles of general interest, some advantages in form of lower prices (social prices) for certain groups of consumers associated with potential vulnerability exist.

In the UK, an specific regulation for protecting citizens' rights does not exist and confidence in the market forces dominates policy action in a further extent. Nevertheless, as a distinctive feature the UK has been pioneer not just in the market-oriented reform of public infrastructure services, but also in developing specific regulatory policies addressed to the vulnerable consumers, in a similar spirit than those pretended by the EC. These policies aim at boosting consumers choice and market competitive functioning by two main focus: on the one hand, on evaluating consumers' opinion, as a base for designing policy objectives; and on the other hand, on promoting and supervising information in the markets and practices for an efficient use of the services in order to increase consumers' participation and confidence (OFCOM, 2009; OFGEM, 2010). The design of these policies is based on the observation of difficulties for decision making in a context of complexity, following the insights on consumer behaviour derived from Behavioural economics (OFCOM, 2010). In the UK, policies specifically addressed to vulnerable consumers have been particularly explored in energy markets (OFGEM, 2012), by identifying consumers in vulnerable positions and developing targeted regulatory obligations (for instance, to provide with free services on request as meter readings and information in accessible format to a list of consumers with high age, a disability or a chronic sickness). Also the best ways of providing information and support to consumers and encourage switching are being explored (Stern, 2012). However, these policies specifically addressed to vulnerable consumers are still at a starting point, with governments, regulators, consumers associations and firms questioning the best means and approaches to design them, in order to incorporate the specific needs of particular groups of citizens associated to potential vulnerability as consumers into an effective regulation.

4. Data and methodology

The analysis of public infrastructure services from the citizen perspective can be empirically addressed from two sources: revealed preferences (RP), consisting of information on observable choices made by individuals, and stated preferences (SP), referred to the subjective self-evaluation of satisfaction, derived from their opinions (Frey and Stutzer 2002; Van Dooren and Van de Walle, 2008). RP enable to use indicators with an objective character, as those in which most of the analyses in the field of economics have focused. RP have been used, in the case of public infrastructure

services, to evaluate the effect of regulatory reform of the British gas market on households with different socio-economic characteristics (Hancock and Waddams Price, 1996; Gómez-Lobo, 1996).

Individuals' revealed behaviour, however, does not allow by itself to analyse aspects as motivation of not using a service or what decisions, according to the biases identified by Behavioural Economics, implies not maximizing the own individual utility. In the case of public infrastructure services, in addition, their markets are not competitive, but quasi-markets (Clifton and Díaz-Fuentes, 2010): both the exit and the change of supplier have a high cost for the citizens and, thus, consumption decisions may particularly not always reflect their real preferences. As a result, according to Hirschman's exit-voice-loyalty framework (Hirschman, 1970), their voice, from the evaluation of SP, is also an essential element to consider. Thus, SP allow analysing beyond consumers' observed behaviour, as they may help shed light on the reasons for their behaviour or the results they obtain from that behaviour. From information on SP, Clifton *et al.* (2005), Fiorio and Florio (2008 and 2011), Clifton and Díaz-Fuentes (2010) and Bacchiocchi *et al.* (2011), have evaluated the reforms of public infrastructure services from the perspective of citizens as consumers, finding that the results in terms of satisfaction do not systematically coincide with those expected according to the theoretical benefits of the reforms.

Both RP and SP are subject to various limitations but, as suggested by Fiorio and Florio (2008), both sources bring different elements of particular interest. The empirical analysis of this paper is based on the complementary analysis of citizens' SP and RP towards electricity and telecommunications services. Following Whitehead *et al.* (2008), combining both sources allows to maximize their respective strengths, whilst minimizing their weaknesses, thus enriching the interpretation of data and the results obtained. With this approach, this paper aims to contribute to the development of new evidence for evaluating and improving public infrastructure services regulation from the citizens' perspective, as a complement to the traditional regulation of these services after their market-oriented reforms.

Regarding public infrastructure services and in the European context, the most powerful sources for SP are the Eurobarometers. These surveys are promoted by the European Commission with policy evaluation purposes. This paper uses the microdata of the Special Eurobarometer 65.3 on Services of General Interest (EB) (EC 2007), the most recent Eurobarometer specifically and broadly dedicated to public infrastructure services. It includes information on European citizens' opinions regarding these services (use, accessibility, affordability, importance and so on), as well as on their main socioeconomic characteristics. On the other hand, regarding RP, the Household Budget Surveys (HBSs) are useful tools in the European context. These are official surveys developed at the national level, which include information on households expenditure broadly disaggregated, as well as on their main socioeconomic characteristics. However, in most of the EU countries this sources are considered disclosive information, and thus access to these sources is strictly restricted. In this

paper, information used is derived from the microdata of the HBSs for Italy (ISTAT, 2006), Spain (INE, 2006) and the UK (ONS, 2006), where this information is available.

From this information, this paper aims to contrast the following hypotheses:

H1. Citizens with socio-economic characteristics associated to potential vulnerability as consumers exhibit lower satisfaction with the price of the services under analysis.

H2. Citizens with socio-economic characteristics associated to potential vulnerability as consumers exhibiting lower satisfaction reflect also different expenditure patterns as regards public infrastructure services.

H3. Differences as regards socio-economic characteristics detected in H1 and H2 are commonly observed in the three countries under analysis.

Both sources are analysed separately and then the results are interpreted jointly. This approach for contrasting SP and RP is denominated comparison analysis (Whitehead *et al.*, 2008). Our analysis follows Kahneman and Thaler's (2006) description of the decision-making process which is divided into two steps: firstly individuals make their choices, reflected in RP, and secondly they obtain a degree of satisfaction, reflected in SP. In order to present the results clearly, we first analyse SP, in order to detect which socio-economic groups are associated with lower levels of satisfaction. Then, we analyse RP, in order to assess whether SP are confirmed through behaviour and how this impacts upon the use of the services.

From analysing SP, we consider that an evidence of a problem is detected for a particular group of vulnerable citizens as consumers when the independent variable representing their common socioeconomic characteristic is related to lower satisfaction with the price of a service. Then, it is required to evaluate if this is also reflected in terms of expenditure and, in that case, how. By assuming that expenditure on a service is derived from a unit price multiplied by a quantity purchased, we interpret the results by providing three major scenarios. One scenario may be that a particular group of citizens is associated with lower satisfaction and also lower expenditure on a service. This could be explained because these citizens purchased a smaller amount of that service (for instance, by limiting the number of phone calls) or, because they purchased a lower quality service (such as contracting a poorer internet connection). So, this group of citizens has restricted its consumption in this market, due to their difficulties with and lower confidence in that market, as expressed through their lower levels of satisfaction. A second scenario is where a group of citizens is associated with lower satisfaction with, but higher expenditure on a service: the explanation here is that they are paying a higher unit price for these services, that is, these citizens may have taken poorer consumption decisions, so their participation is not restricted but their difficulties are reflected in lower satisfaction. Finally, where a group of citizens are less satisfied than their peers but have similar expenditures, this could be because their satisfaction is inconsistent or derived from

other dimensions of service provision or regulation, or that they are paying a higher unit cost while participating less in the market, thus generating an ambiguous effect on expenditure.

As regards SP, the dependent variable analysed is the binary variable y , defined as:

$y_i = 1$, in case that the individual i states to be satisfied with the price of the service.

$y_i = 0$, otherwise.

From this, we obtain the following function, which relates the probability of stated satisfaction with the price of the service with a vector of independent variables x :

$$\Pr(y_i = 1) = F(x_i' \beta)$$

Then, assuming that F is distributed as a standard normal we obtain the probit model:

$$\Pr(y_i = 1) = \Phi(x_i' \beta)$$

From this model, we estimate the marginal effects of changes in each independent variable x_j on citizens' probability of being satisfied with the price of each service from the following equation:

$$\frac{\partial \Pr(y_i = 1)}{\partial x_j} = \Phi(x_i' \beta) \beta_j$$

As regards RP, the dependent variable is the logarithm of households' expenditure on a category of services (electricity and telecommunications), expressed in Euros per year. To analyse RP, telecommunications (fixed telephone, mobile telephone and internet) are considered as a joint category, since no further disaggregation of information by individual telecommunications services is conducted in all the HBSs. For each category, the dependent variable is analysed from an OLS equation:

$$\ln(EXP_i) = x_i' \beta + u_i$$

Where:

EXP_i is household i expenditure on a category of services.

x_i is a vector of independent variables for household i .

The independent variables (x) have been selected following the literature on vulnerable

consumers (OFT, 1998; OECD, 2008). Of those socio-economic variables associated with potential vulnerability, comparable data available across both the *Eurobarometer* and the HBSs includes 1) education 2) age and 3) employment status. In addition, we include control variables in order to correct for the most important factors which may influence satisfaction with and/or expenditure on services: country of residence; household size (capturing the effect of the scale on consumption); housing occupancy status (differentiating home-owners from those who rent); and sex. To analyse RP, we also include household income as a control variable, as the dependent variable is expressed in monetary terms.

In the analysis of SP, the three dimensions of citizens' potential vulnerability as consumers led to the following independent variables (x): employment, the non-employed (*NOOCUP*) compared with the employed; age, those over 64 (*MORE64*) versus the middle-aged and the young; and education, the lesser-educated (*EDBASIC*) versus those with higher education (category of reference). Regarding RP, we focus on the same dimensions: employment, those households where no members are employed (*NONEOCUP*) versus those with two or more employed members (category of reference); the age of the reference person, comparing those over 64 (*RP MORE64*) versus the middle-aged and the young; and the education of the reference person, comparing the lesser-educated (*RP EDBASIC*) with those with higher education (category of reference). Both for SP and RP, in order to contrast the third hypothesis, the three dimensions of potential vulnerability in which the paper focuses are analysed considering the interaction effect between each of these dimensions and the country of residence. Thus, it is obtained to what extent the effects detected are commonly observed in Italy, Spain and the UK.

5. Results

Estimations for citizens' satisfaction on services are shown in table 2, whilst estimations for households' expenditure on them are shown in table 3. The discussion of the results is organised by considering the three categories associated with citizens' potential vulnerability as consumers: educational attainment; age; and employment status.

Education

Considering the whole sample for the three countries, citizens with basic levels of education are less satisfied than the reference group (those with higher education) with the price of all the services under analysis. Nevertheless, the effect is larger in the cases of mobile telephone (-12.5% of probability of being satisfied) and especially internet (-21%) than in those of electricity (-7.7%) and fixed telephone (-8.8%). Analysing the interaction effect by country, the effects for mobile telephone

and internet are commonly observed in all the three countries. The effect for fixed telephone is commonly observed in Italy and Spain, but not in the UK. Finally, the effect for electricity is only observed in Italy.

These results are contrasted with those derived from RP. For telecommunications, expenditure by citizens with basic education is lower. For these citizens, lower satisfaction combined with lower expenditure in telecommunications markets may reflect that they face particular difficulties, which are translated into a reduced participation (consumption) in these markets. This may be the case in Italy and Spain. In the UK, the same explanation may apply, combined with a higher unit price paid by these consumers. Using insights from Behavioural economics, these results can be related to certain biases experienced by the less-educated consumers, which difficult their optimal decision making in the market. As described by George *et al.* (2011), the lower levels of literacy or numeracy skills by these consumers increase the risk of making poor decisions, as augmenting the difficulties for accessing and for analysing the information required for decision making. These factors also increase reliance on others for information and advice, which contribute to explain the results for these consumers due to the effect of social networks in decision making. For the less-educated, there is also a higher risk of experiencing the “choice overload” bias, described by Iyengar and Lepper (2000): situations where due to the excessive complexity of the information existent and the decision-making process, satisfaction decreases (instead of increasing) as the amount of alternatives and choice available increase.

For electricity, in Spain and the UK, expenditure by citizens with basic education is lower. As this is not combined with significant differences in satisfaction, it may be derived from differences in consumption (quantity purchased). In Italy, lower satisfaction with the price is not reflected in a significant effect on expenditure. Thus it may be derived from a lower consumption combined with a higher unit price, or may reflect dissatisfaction among these citizens with other aspects of service provision or regulation.

Age

Citizens over 64 are much less satisfied than the reference group (those between 35 and 49) with the price of mobile telephone (-23%) and internet (-37.7%). This effect is commonly observed in the three countries under analysis. In contrast, not significant effects are observed as regards satisfaction with the price of fixed telephone. Even in the UK, satisfaction with the price of this service among the aged population is higher. In the case of electricity, no significant differences in satisfaction with the price between those over 64 and the category of reference are detected in Italy and the UK, whilst in Spain the aged population expresses lower satisfaction.

As regards RP, expenditure in telecommunications is higher among those over 64 in Spain and the UK, whilst not significant differences are observed in Italy. Commonly in the three countries under analysis, lower satisfaction with the price of mobile telephone and internet among these

citizens may reflect they face particular difficulties in these markets, inhibiting their consumption in favour of fixed phone, this generating a higher unit price reflected in higher expenditure (i.e., using a fixed phone to call a mobile phone). In Italy, the same explanation may apply, combined with lower consumption (quantity purchased) of telecommunications services. Consumers with higher age show inertia in favour of using a more traditional service, as fixed telephone, instead of the new telecommunications services, as mobile telephone and internet. This led to poorer results for these consumers in telecommunications markets, as obtaining lower satisfaction and even in some countries paying more. Using insights from Behavioural economics, inertia can be explained by the endowment effect described by Kahneman *et al.* (1991): self-valuation of a good or service increases when a consumer possesses it, and thus the disutility of losing it is higher than the utility that may suppose acquiring it for the first time. This leads to the *status quo* bias and to procrastination in decision making (O'Donoghue and Rabin, 2008). For those consumers with higher age, the *status quo* bias may be particularly important, due to the existence of consolidated habits and higher loss aversion.

For electricity, in Italy and the UK, higher expenditure among those over 64 combined with not significant differences in satisfaction may be derived from a higher quantity purchased, due to different lifestyles. In Spain, higher expenditure combined with lower satisfaction with the price among these citizens may be derived from a higher unit price paid (for instance due to poorer energy saving strategies), or with a particular perception of unfairness as regards the cost.

Employment

Considering the whole sample for the three countries, citizens who are not employed show slightly lower satisfaction with the price of mobile telephone (-4.8%) and internet (-5.2%). In contrast, this effect is not observed for fixed telephone and for electricity. Disaggregating by country, the lower satisfaction with the price of mobile telephone and internet among those not employed is observed in Spain and the UK, but not in Italy. In the UK, those not employed are also less satisfied with the price of fixed telephone.

As regards RP, expenditure in telecommunications is lower among those not employed (-33.3%). This effect is commonly observed in the three countries under analysis, although it is higher in Spain and in the UK than in Italy. Lower satisfaction combined with lower expenditure among those not employed in Spain and the UK may reflect particular difficulties, translated into a reduced participation (consumption). In Italy, particular difficulties as regards this dimension reflected in a lower satisfaction are not detected. In general, the problems detected for those consumers not employed are concentrated in the newest telecommunications services. As described by George *et al.* (2011), these consumers experience a higher risk of loss of self-confidence and self-esteem, which may lead to risk aversion, constituting a barrier towards the use of new services. Also, the influence of the social networks on decision making can contribute to explain this result, as these networks

could be more restricted for these consumers due to the lack of participation in the labour market.

For electricity, not significant differences are observed for those not employed as regards satisfaction, neither as regards expenditure, in Italy and Spain. In the UK, lower expenditure among those not employed combined with similar satisfaction may be derived from a lower quantity purchased.

As regards the control variables, it is detected: lower satisfaction with the price of telecommunications among those living alone, lower satisfaction with the price of internet among women and lower satisfaction with the price of all the services under analysis for non homeowners. All these characteristics are also reflected in particular patterns of expenditure on these services. Interestingly, citizens in Spain and, particularly, in Italy, systematically exhibit lower satisfaction with the price of all the services. Whilst for electricity this is reflected in higher expenditure in these countries, this does not occur for telecommunications.

Table 2. Marginal effects on satisfaction with the price of the services

Variable	Electricity		Fixed tel.		Mobile tel.		Internet	
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
<i>EDBASIC</i>	-0.077***		-0.088***		-0.125***		-0.210***	
<i>EDBASIC-ITA</i>		-0.161***		-0.105**		-0.150***		-0.252***
<i>EDBASIC-SPA</i>		-0.038		-0.112***		-0.093**		-0.212***
<i>EDBASIC-UK</i>		-0.012		-0.040		-0.150***		-0.169***
<i>EDSECOND</i>	-0.079***		-0.072**	-0.066**	-0.064**	-0.067**	-0.113***	-0.118***
<i>LESS35</i>	-0.005	-0.007	0.003	0.001	0.039	0.040	0.060**	0.059**
<i>FROM50TO64</i>	-0.018	-0.019	0.038	0.034	-0.031	-0.034	-0.054*	-0.058*
<i>MORE64</i>	-0.070*		0.005		-0.217***		-0.312***	
<i>MORE64-ITA</i>		-0.027		-0.019		-0.164***		-0.235***
<i>MORE64-SPA</i>		-0.187***		-0.064		-0.290***		-0.268***
<i>MORE64-UK</i>		-0.027		0.095***		-0.230***		-0.377***
<i>NOOCUP</i>	-0.012		-0.033		-0.048**		-0.052**	
<i>NOOCUP-ITA</i>		-0.020		0.031		0.006		-0.004
<i>NOOCUP-SPA</i>		0.032		-0.058		-0.080**		-0.056***
<i>NOOCUP-UK</i>		-0.043		-0.113***		-0.094**		-0.093***
<i>ONEPERSON</i>	-0.023	-0.025	-0.054*	-0.050*	-0.094***	-0.094***	-0.099***	-0.097***
<i>THREEPERS</i>	-0.024	-0.024	0.013	0.011	0.026	0.024	0.016	0.015
<i>FOURPERS</i>	-0.092***	-0.097***	0.008	0.004	0.018	0.014	0.077**	0.075**
<i>MOREFOURP</i>	-0.047	-0.052	-0.003	-0.006	-0.021	-0.029	0.015	0.010
<i>WOMAN</i>	-0.014	-0.015	0.012	0.013	-0.000	-0.002	-0.056***	-0.056***
<i>NOPROP</i>	-0.085***	-0.082***	-0.125***	-0.124***	-0.130***	-0.130***	-0.124***	-0.125***
<i>ITALY</i>	-0.250***	-0.194***	-0.348***	-0.364***	-0.179***	-0.243***	-0.255***	-0.286***
<i>SPAIN</i>	-0.135***	-0.138***	-0.236***	-0.187***	-0.168***	-0.193***	-0.173***	-0.194***
N	3,367	3,367	3,367	3,367	3,367	3,367	3,367	3,367
Wald chi2	174.55	200.91	287.24	312.96	274.05	339.61	381.45	499.60
Prob > chi2	0.000	0,000	0,000	0,000	0,000	0,000	0,000	0,000

Notes: Standard errors in parenthesis. Statistical significance at 1% (***), 5% (**), 10% (*).

Table 3. Estimates on households' expenditure on the services.

Variable	Electricity		Telecomm.	
	Coeff.	Coeff.	Coeff.	Coeff.
<i>Constant term</i>	1.650***	1.628***	-0.428**	-0.549**
<i>RP EDBASIC</i>	-0.083***		-0.121***	
<i>RP EDBASIC-ITA</i>		0.015		-0.138***
<i>RP EDBASIC-SPA</i>		-0.052*		-0.228***
<i>RP EDBASIC-UK</i>		-0.220***		-0.022
<i>RP EDSECOND</i>	-0.058*	-0.067*	-0.041***	-0.038
<i>RP LESS35</i>	-0.128***	-0.115***	-0.046	-0.034
<i>RP FROM50TO64</i>	0.221***	0.225***	0.127***	0.122***
<i>RP MORE64</i>	0.385***		0.109***	
<i>RP MORE64-ITA</i>		0.089***		-0.038
<i>RP MORE64-SPA</i>		0.142***		0.112***
<i>RP MORE64-UK</i>		0.877***		0.276***
<i>NONEOCUP</i>	-0.124***		-0.333***	
<i>NONEOCUP-ITA</i>		-0.019		-0.263***
<i>NONEOCUP-SPA</i>		0.032		-0.385***
<i>NONEOCUP-UK</i>		-0.308***		-0.365***
<i>ONEOCUP</i>	0.003	0.002	-0.087***	-0.086***
<i>ONEPERSON</i>	-0.262***	-0.276***	-0.456***	-0.469***
<i>THREEPERS</i>	0.203***	0.209***	0.281***	0.282***
<i>FOURPERS</i>	0.373***	0.369***	0.444***	0.444***
<i>MOREFOURP</i>	0.512***	0.524***	0.640***	0.651***
<i>RP WOMAN</i>	-0.042	-0.025	0.128***	0.139***
<i>NOPROP</i>	-0.437***	-0.421***	-0.094***	-0.101***
<i>LnSPENDeq</i>	0.422***	0.423***	0.685***	0.690***
<i>ITALY</i>	0.283***	0.299***	-0.085***	0.023
<i>SPAIN</i>	0.099***	0.113***	0.002	0.149***
N	49,719	49,719	49,719	49,719
F	108.35	132.59	273.67	238.73
Prob > F	0.000	0.000	0.000	0.000

Notes: Standard errors in parenthesis. Statistical significance at 1% (***), 5% (**), 10% (*).

6. Conclusions

From the 1980s, public infrastructure services experienced deep market-oriented reforms in the EU countries. These reforms, by providing increasing opportunities for choice, aimed to benefit citizens as consumers, understood as rational and selfish decision-makers. However, as alternative views on consumer behaviour arose, as those derived from Behavioural economics, concerns emerged for policy makers on how increasing complexity may affect citizens as consumers, particularly those referred as “vulnerable consumers” (OECD, 2008; EC, 2012; ECCG, 2013). This paper analysed

differences in behaviour and satisfaction in the markets of electricity and telecommunications in three large European countries (Italy, Spain and the UK) after market-oriented reforms, focusing on three dimensions representative of potential citizens' vulnerability as consumers: education, age and employment. From these results, empirical evidence with significant implications for policy-making arises.

Responding to the hypotheses considered in this paper it is observed, first, that for many of the services and dimensions under analysis, citizens potentially vulnerable as consumers exhibit lower satisfaction with the price. Commonly, these patterns as regards satisfaction are also associated to different expenditure patterns among these citizens. Nevertheless, distinctive features are observed depending on the socio-economic dimension considered, but also depending on the characteristics of the service and the country. Thus, citizens' context and circumstances greatly matter for explaining differences between citizens in their behaviour and price satisfaction towards public infrastructure services. Insights from Behavioural economics provide useful interpretations for these results, as well as recommendations for regulatory policies that may help to address the problems detected.

A key element explaining the distinctive features observed is the socio-economic dimension considered as representative of potential vulnerability. As expected, not each dimension is equally related with the probability of experiencing difficulties in the markets, reflected in differences in satisfaction with the price of the services (gaps in satisfaction). Gaps in satisfaction related to education are commonly observed for all the services, although with different intensity. Even higher gaps in satisfaction are observed related to age, but only concentrated in some services. Finally, as regards the employment dimension, lower gaps in satisfaction are detected and just concentrated in some services. These results can be explained using insights from Behavioural economics, as described in detail in section 5. In particular, low education increases the risks of experience difficulties for accessing and/or analysing the information required for decision making, as well as the choice overload bias. For those with high age, the risk of experiencing the *status quo* bias, and thus inertia in decision making, is particularly higher. Finally, for those not employed, risk aversion seems particularly higher. Additionally, influence of social networks on decision making leads to additional biases that can contribute to explain the results obtained.

The characteristics of the service, and its relation with the socio-economic dimensions under analysis and the biases described by Behavioural economics, is an additional crucial element for explaining the distinctive features. For electricity, no general gaps in satisfaction with price are observed as regards socio-economic dimensions representative of potential vulnerability. In contrast, these gaps are concentrated in telecommunications services and, particularly, in the newest services (mobile telephone and the internet). Citizens potentially vulnerable as consumers exhibit particular difficulties in mobile telephone and internet markets, reflected in lower satisfaction, affecting their expenditure decisions: by reducing the participation (those with lower education and those not

employed) or by concentrating in the use of fixed telephone, leading to poorer results (those with high age). In contrast, similar results are not detected in other markets, as electricity and fixed telephone, even whilst similar reforms were introduced. The higher degree of complexity of telecommunications markets with respect to electricity markets (as for product differentiation, complexity of tariffs and product packages), as well as the degree of technological innovation and novelty of the services (as observed for mobile telephone and particularly the internet), contributes to explain the differences between services and the particular difficulties potentially vulnerable citizens, which tend to react inhibiting their participation. This may be a crucial concern, creating vicious circles, as these citizens may use services as the internet for addressing certain factors associated to vulnerability (for instance, to seek for a job or to increase their educational attainment) or their difficulties in certain markets (for instance, by accessing to more easily comparable information). In contrast, the existence of experience and habits in decision-making for electricity and fixed telephone services contributes to provide easier decisions based on status quo even when sub-optimal, the so-called “satisfaction options” (Van de Walle and Bovaird, 2007).

As regards recommendations for regulation, the results obtained in this paper reflect that the context matters both for the design and for the evaluation of public infrastructure services regulation. Citizens’ socio-economic background and characteristics, as well as their interaction with service characteristics, reveal to play a key role in explaining decisions in the market and satisfaction derived from them. Thus, regulatory design can improve its results in terms of consumers’ satisfaction and market functioning if incorporating citizens’ and markets’ heterogeneity as consumers, avoiding simplistic representations as those constituted by the “*homo oeconomicus*” or the “average consumer”. This can be addressed by regulation taking the form of the so-called “asymmetric paternalism” (Camerer *et al.*, 2003), whose objective is to focus on specific groups of consumers experiencing problems for decision making. By combining empirical evidence with insights providing further understanding of consumer behaviour, specific regulatory policies should be introduced in those areas and for those consumers where specific problems are detected. In particular, from the results obtained in this paper, combined with insights obtained from Behavioural economics, some clear recommendations are extracted aiming to improve effectiveness of regulatory policies. For the less educated, the key problems detected are related to difficulties for accessing and analysing the information required for decision making, particularly in the new telecommunication services. Regulation should focus on facilitating that easier and understandable information is provided for these consumers (as easier tariffs, tools for comparing offers and personal attention for consulting and complaining). For the elderly, main problems are related to inertia against the use of the newest services. In this case, regulation should focus in avoiding the *status quo* bias by reducing the perceived costs of switching (for instance, by providing default options via more simple and cheaper offers for a basic access to new services, without affecting the use of the others). For these consumers, as for those not employed, reducing loss aversion reveals essential, which can be

addressed by guaranteeing personal attention in case of doubts, problems and complaints, and by facilitating consumers to go back in their decisions in these cases. Finally, it is generally observed how the existence of habits can lead to improve consumers' satisfaction, especially for those with higher difficulties for adapting their decisions to a new environment or situation. For this reason, an additional general recommendation is to favour (except when specific benefits in a particular moment may be achievable by changes) the stability of market conditions and of the regulatory framework.

Finally, as a corollary of the conclusions previously described, reinforcing the evaluation of the functioning of public infrastructure services markets from the perspective of citizens as consumers reveals as a powerful tool for improving regulation of these markets. From the results obtained in this paper, it is observed how for some services and socio-economic dimensions representative of potential consumer vulnerability, but not for others, vulnerable citizens experience particular difficulties in the markets of public infrastructure services, affecting their decisions on expenditure and use of these services. From combining the evaluation of these markets from the citizen/consumer perspective and insights for better understanding this perspective derived from Behavioural economics, as shown, socio-economic dimensions, areas and markets where potential vulnerability is reflected in difficulties may be identified. Thus, also specific regulatory policies can be designed and evaluated from the same perspective, aimed at empowering consumers in those markets where they may be necessary, as a result of the problems detected. From further evidence from the consumer perspective, reasons explaining the difficulties experienced by vulnerable citizens in certain markets, as well as the most useful policy actions to tackle them may be explored. For future research, the development of further sources of information providing comparable data as regards SP and RP reveals essential, in order to facilitate the evaluation of these markets and the design of particular regulatory policies.

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