# EUROPEAN CONSUMERS' ATTITUDES ON SERVICES OF GENERAL INTEREST: ACCESSIBILITY, PRICE AND QUALITY

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# European Consumers' Attitudes on Services of General Interest: Accessibility, Price and Quality

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**Abstract**

The research question addressed by this paper is a simple one: are European consumers happy with the services provided by the utilities after two decades of reforms? We focus on electricity, gas, water, telephone in the EU 15 Member States. The variables we analyse are consumers' satisfaction with accessibility, price, and quality, as reported in three waves of Eurobarometer survey, 2000-2002-2004 , comprising around 47,000 observations. We use ordered logit models to analyze the impact of privatization and regulatory reforms, controlling for individual and country characteristics. Our results do not support a systematic association between consumers' satisfaction and the standard reform package of privatization, vertical disintegration, liberalization.

**Keywords:** consumers' satisfaction, gas, electricity, telephone, water, Eurobarometer

**JEL**: L94, L95, L96, L50

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# 1.    Introduction

The research question addressed by this paper is a simple one: are European consumers happy with the services provided by the utilities after two decades of reforms? Privatization, vertical disintegration and liberalization have extensively reshaped the structure of network industries (Newbery,2000), such as telephone, electricity, gas, and water in the European Union since the 1980s, see e.g. Martin, Roma and Vansteenkiste (2005) for a survey. While empirical literature has usually focussed on changes in efficiency of the industry, rather surprisingly the research on the impact of utility reforms on consumers is less developed (with some notable exceptions, such as the research by Catherine Waddams and associates, see e.g. recently Brazier et al 2006, Giulietti et al. 2005). Moreover, most of the empirical literature on this subject deals with individual countries, because of the difficulty of working with comparable cross-country evidence.

While applied welfare economist would turn to objective evidence as their first choice of data for empirical analysis and evaluation of reforms, in this paper we explore perceptions by consumers, i.e. subjective data on happiness with three dimensions of services of general interest (SGI): accessibility,price and quality. Thus we do not directly study whether utility reforms explain variations in welfare of consumers across countries and time periods, but whether they are correlated to their perceptions. There are two reasons to consider data on social attitudes. First, because they are important per se. Policy-makers and regulators are well aware that SGI reforms are in the forefront of public debate in the European Union (the widespread concern about the Bolkenstein Directive on the liberalization of services being a clear example). Changes over time and variations across EU countries can be seen as a natural experiment on a pattern of reform. Second, subjective data can be a complement to objective evidence in order to evaluate the welfare impact of reforms. Ideally, for example, one would use both detailed microdata on price paid and expenditure by households, or on objectively measured quality, along with individual attitudes on these dimension of SGI, to test economic welfare change and compare them with 'happiness' measures. If the two measures do not correlate, this fact would need further research to understand whether the cognitive process by the consumer is biased, or whether the objective statistical evidence does not capture details in SGI provision best known to the user (e.g. aspects of quality, or of price discrimination not reflected in average price indexes).

While in a related research work we explore the combination of objective and subjective evidence to evaluate utility reforms, in this paper we focus exclusively on attitudes. We use three waves of Eurobarometer Surveys, 2000-2002-2004, for the EU 15 countries, and try to test the impact of privatization and regulatory reforms on attitudes of users of electricity, gas, telephone, water. To do so, after a discussion of our research motivation (Section 2), presentation of Eurobarometer data (Section 3), and descriptive statistics (Section 4), we estimate a set of ordered logit models (Section 5). We regard the results as a preliminary exploration and in the Concluding section we discuss them and future research needed.

## 2.      Research motivation

Over the last twenty years governments and lawmakers of the Member States of the European Union have embarked on a wide range of reforms of public services. These include electricity, gas, telecommunications, water, railways, other public transport modes, postal services, and other services of general interest, previously fully or partly nationalized.   Following a dramatic reversal of policy trends, initiated in Great Britain in the early '80s (Florio, 2004), European governments have more or less enthusiastically or reluctantly divested their ownership of assets in network industries, and adopted large-scale privatization policies.

While the EU legislation is fairly neutral about ownership itself (except for its unambiguous hostility to uncompetitive State aids to public corporations in the form of increasing deficit to fund deficit), it strongly supports liberalization of service industries, most of them originally excluded by the scope of the directives on the European markets integration. A continuous flow of EU directives (the framework legislation to be translated into national laws),  have provided for the opening of the service markets to competition, thus attempting to break legal or de facto monopoly power of the incumbent firms. In addition, antitrust powers of the European Commission have backed national competition policies.   Instrumental to liberalization policies, a set of structural changes have been made compulsory by EU legislation, most notably the vertical disintegration of network industries. An entirely new set of regulatory institutions has emerged as substitutes or complements of the competencies of ministries. A new paradigm has emerged, that tends to see privatization, liberalization, and vertical disintegration as germane policies.

While the overall reform trend is clear and widespread, its timing and implementation shows considerable variations across the fifteen 'old' EU Members States and the ten new members that acceded in 2004. Moreover, the outcome of the reforms is still under scrutiny. Supporters of the new paradigm have little doubts about the net social benefits of the reform process, but criticism on it is far from being overwhelmed by evidence. Some of the criticism against privatization and liberalization may be a reflection of vested interests in the incumbents, such as the trade unions or political patronage. There are however vested interests in the privatization and liberalization camp as well, and the political economy of the process is indeed a complex one (Bortolotti and Pinotti, 2003). Moreover, the economics of regulated industries, and occasional observation, show that under some circumstances the reforms can fail, for example when regulatory institutions are unable to contain new forms of market dominance after divestiture of state owned enterprises by privatized incumbents. Vertical disintegration is a particular area of concern, because there are indeed substantial costs associated to the separation of fixed capital and its operation: these costs need to be evaluated case by case against the benefits of competition (Newbery, 2000).

Because the jury is still out, the last word on the outcome of the reforms rests ultimately on empirical analysis. Consequently the evaluation of the success or failure of the privatization-vertical disintegration-liberalization paradigm in the EU needs a careful analysis of its impact on society at large.

It is apparent that, while there is a common direction of reform, substantial variations exist over time and across states. Empirical analysis should exploit this variability.

As mentioned above, we are interested in the social outcome of reforms. This would imply a joint considerations of impacts on all social actors, including workers, shareholders, taxpayers, and consumers. Moreover ideally we would need to evaluate general equilibrium

effects, because, for example, reforms of the electricity or transport industries may have an impact on other industries, such as manufacturing.

In order to make the evaluation more manageable, it would seem wise to break down the empirical analysis by types of agents, and focus on first round partial equilibrium impacts (as typically done by applied indirect tax reform literature). After all, if consumers at large do not benefit directly from reforms, it seems unlikely that indirect benefits to them through impacts on other industries, or benefits to other agents, can change dramatically the evaluation.

If we accept the above working hypothesis (i.e. we focus here on direct welfare changes of consumers) we need suitable welfare measures. In a standard cost-benefit analysis framework this implies to evaluate changes in consumer surplus along individual compensated demand curves, or to recur to other suitable individual marginal welfare measures, such as compensated or equivalent variations. One crucial problem with this approach is that when moving to applied social impact analysis, we need knowledge of individual preferences, and of a social welfare function (to assign a weight to changes in consumer surplus). There are shortcuts to diminish the informative burden of this approach (Banks, Blundell and Lewbel, 1996; Brau and Florio, 2003) and we hope to be able to further explore it in future, but it still needs data not easy available in a European-wide perspective. Moreover, the informative cost of these shortcut welfare measures is that unavoidably individual data are skipped and substituted by more aggregated proxies. One example of the analytical cost involved in the process may clarify this point.

On average, the own price elasticity of demand for water is low, reflecting the feature of a necessity good. Hence, under standard assumptions, the welfare effect of a price change as measured along a compensated demand function is low. Water consumers however are different types, and in turn water uses range from drinking and sanitation to swimming pools and car washing. Thus welfare effects and willingness to pay do change according the income and other traits of users. Moreover, income effects of water tariff rebalancing can be non-marginal for the poor, and income effects should be considered, when no actual compensation is offered to reform losers. For example, the EBRD considers socially affordable water tariffs when expenditures are no more than 3% of income. For the bottom decile, however, the share of the bill on income can be substantially higher than the average, up to 10% in some transition countries, so that doubling water tariffs over some years may virtually extract 20% of income for some users (e.g. pensioners) in transition economies. Looking at the average or representative consumer of public service can thus be misleading to evaluate the social impact of reforms (Mairate and Angelini, 2007).

The informative burden to look into individual agents is considerable, because we need to know preferences about different uses, price structures for type of users, and their income. This information at EU level is not available in comparable form across Member states. For example, we have comparable national data on the price per kWh by domestic users of electricity broken down by ranges of yearly consumption, but we do not have comparable information on the income of those users, or the number of individuals by each household. In spite of all the debate on reforms of public services, and a huge academic research on the topic, we are very far from availability of the very basic statistical information on welfare measures for utilities, and applied researchers need often to rely on crude and highly aggregate data.

One strategy to discover some individual-level information is to adopt a different empirical shortcut: instead of (or as a complement to) relying on *revealed preference* through the

estimation of individual compensated demand functions (or their proxies) we can turn to *stated preferences*, i.e. subjective well-being measures. In other words, we ask consumers direct questions about their self- assessment of satisfaction.

While this may look as a dramatic change of perspective in economic welfare analysis, it is in fact much less strong that it may appear when compared with actual practice of cost-benefit testing in project or policy evaluation. In fact, applied CBA, usually regarded as objective welfare evaluation and often officially endorsed by government agencies, routinely uses contingent evaluation methods e.g. in regulatory impact analysis (see Boardman at al, 2005 for a survey of applied literature). Such methods revolve around eliciting, through surveys on users, direct information on willingness-to-pay or willingness-to-accept policy changes.

To an applied welfare economist, using revealed or stated preferences is a matter of convenience and data availability more than a fundamental methodological divide.

This discussion of empirical approaches to the evaluation of the welfare impact of policy reforms has a close resemblance with the wider debate on the merits of the 'economics of happiness' (Graham, 2006, Layard, 2005). The typical focus of this recent research avenue is the study of the relationship between subjective well being as self assessed by individuals, and objective macroeconomic welfare indicators, such as national income, inflation or unemployment (Frey and Stutzer, 2002). We propose to use a similar approach in a microeconomic context. Services of general interest are sufficiently important to influence perceptions of well being. While such perceptions can be wrong, they are of course based on the information set available to the respondent, plus an idiosyncratic bias. Thus, when a respondent says, in one country and in one year, that she evaluates the price or quality of water as 'fair', we can assume that she is telling us something about her subjective well being. It seems reasonable to assume that if an individual is happy with the price she pays, and the quality she gets for water, transport, gas and electricity, she is in a better (perceived) welfare position than somebody who feels to be compelled to pay too much for what she gets. The parallelism with happiness economics is here that while the latter research typically relates overall subjective well being to macroeconomic issues, here we focus on satisfaction on specific, albeit important consumption items.

If there are variations across time and across countries in the frequency of those who assess the price of services as fair, we can try to understand the determinants of such differences.

Privatization and regulatory reforms are shocks that have changed the structure of the industry considerably in the EU. We want to test to what extent variability of attitudes are influenced by utility reforms. We turn to the variables to be explained in the next two sections.


## 3.    Eurobarometer data

Eurobarometer public opinion surveys (henceforth, EB) have been conducted on behalf of the Directorate-General for Education and Culture of the European Commission each spring and autumn since autumn 1973. They have included Greece since autumn 1980, Portugal and Spain since autumn 1985, the former German Democratic Republic since autumn 1990 and Austria, Finland and Sweden from spring 1995 onwards.

An identical set of questions is asked to representative samples of the population aged fifteen years and over in each Member State. In each household, the respondent is drawn at random.

All interviews are face-to-face in people's home and in the appropriate national language. A detailed analysis on the Eurobarometer data can be found on the official Eurobarometer Web site.[2] The questions concern various aspects, including support and benefit for EU membership, support for a EU constitution, satisfaction with EU democracy and the single currency, general outlook on life and so on.

The regular sample in standard Eurobarometer surveys is 1000 people per country except Luxembourg (600) and the United Kingdom (1000 in Great Britain and 300 in Northern Ireland). In order to monitor the integration of the five new Länder into unified Germany and the European Union, 2000 persons have been sampled in Germany since the Eurobarometer 34: 1000 in East Germany and 1000 in West Germany.

In each of the 15 Member States, the survey is carried out by national institutes associated with the "INRA (Europe) European Coordination Office". This network of institutes was selected by tender. All institutes are members of the "European Society for Opinion and Marketing Research" (ESOMAR) and comply with its standards.

Each survey comes with a set of weights obtained, using marginal and intercellular weighting, carried out on the basis of the population description provided by EUROSTAT in the Regional Statistics Yearbook (data for 1997 or 1996).

In years 2000, 2002 and 2004[3] the Eurobarometer surveys included some questions concerning SGI. The SGI considered are mobile telephone service, fixed telephone service, electricity supply service, gas supply service, water supply service, postal service, transport service within towns/cities and rail service between towns/cities. The criteria used to analyse these services are accessibility, price of services, quality of services, clarity of the information aimed at EU consumers, how fair the terms and conditions of the contracts applicable to the services are, consumers' complaints and how they are handled and customer service.

## 4.    Descriptive statistics

In this paper we restrict our attention to three SGI only: fixed telephone, electricity and gas supply services. For each service we analyse data on customers' satisfaction with respect to three criteria: accessibility, prices and quality, as reported in the above mentioned three waves of Eurobarometer survey. The possible answers are: "No access, Difficult Access and Easy

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[2] http://europa.eu.int/comm/public_opinion/

[3] For Europe, 2004 was an exceptional year in several ways. Four major events stand out in particular: the enlargement of the European Union to include ten new Member States; the European elections which have given a new look to the European Parliament which now has 732 MEPs; the prospect of the signature of the new Constitutional Treaty and, finally, the appointment of a new European Commission. This is the first time that such wide-ranging institutional and political changes have occurred in such a short period of time. This Standard Eurobarometer was organised therefore in a particularly eventful European context. Moreover, the results of this survey reflect these changes. Indeed, significant changes have been noted with regard to certain indicators which have been monitored over recent decades. It would appear, therefore, essential to bear in mind the atypical nature of this European year when analysing evolutions with regard to certain questions. It is also worthwhile emphasising that while the Eurobarometer survey of spring 2004 was conducted by EORG, since autumn 2004, the Standard Eurobarometer is carried out by TNS Opinion & Social, a consortium formed by TNS and EOS Gallup Europe.

access" for accessibility, " Excessive, Unfair, Fair" for prices and "Very bad, Fairly bad, Fairly good and Very good" for quality. A customer is considered satisfied if her/his answer is "Easy access" for accessibility, "Fair" for prices and "Very good" for quality. In this section, we examine the rate of satisfied people as resulting from the 2000 EB survey and changes from 2000 to 2002, from 2002 to 2004 and the overall change from 2000 to 2004. Given the random nature of data, the statistical significance of changes is also tested by the statistics

$$z = \hat{p}_1 - \hat{p}_2 \bigg/ \sqrt{\hat{p}(1-\hat{p})\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$$ where $\hat{p}_1$ and $\hat{p}_2$, $n_1$ and $n_2$ are the rates and the sizes of

the two compared samples and $\hat{p}$ is the weighted mean of $\hat{p}_1$ and $\hat{p}_2$.

All results of our analysis are reported in tables in the Appendix. In the following sections we discuss the main results for each service, sketching the trend the EU15 on average and for a selection of relevant countries.

## *4.1. The fixed telephone service*

The lowest rate of accessibility satisfaction among European customers in 2000 (Table A1 in Appendix) is in Portugal: 10.69% of citizens declares that there is a difficult access and 5.34% of them that there is no access to fixed telephone network. On the opposite, Denmark and Luxembourg have the better access in 2000, with a rate of 98.2% and 100% of easy access to fixed telephone, respectively. In Figure 1 the trends of satisfied people for the overall EU15 countries, and relevant a selection of countries are sketched. No significant variation is observed for Austria, Germany, Great Britain, Ireland and Italy.

The percentage of favourable opinions on prices of fixed telephone service (Table A2) is lower than the percentage of favourable opinions on access to services. The overall percentages of fair judgement on service prices are only 51.65% in 2000. Among countries, the top one is Luxembourg with 72.22% in 2000, whereas Italy (with 26.24% of excessive and 45.25% of unfair answers) has the highest rates in considering unfair or excessive the price of service. As Figure 2 shows the overall EU15 percentage increases slightly in 2002 (+1.56%) and drastically in 2004 (+17,94). The two countries with the largest increases are Austria and Belgium, whilst the two countries with the largest decrease are Greece and Finland. Only for Luxembourg there is no significant variation.

Finally, quality is judged fairly or very bad in Italy, Greece and Portugal and very good in countries like Denmark, Ireland and Luxembourg (Table A3). Quality level is generally considered good: in 2000 a percentage of 93.83% of the EU15 citizens considers very or fairly good the telephone service quality. Figure 3 shows the trends for the overall EU15 countries, for Belgium and Sweden (with the largest increases) and for Finland and France (with the largest decreases). No significant variation is observed for Austria, Denmark, Luxembourg and Portugal.

**Figure 1.** Fixed Telephone Service Access: Easy Access
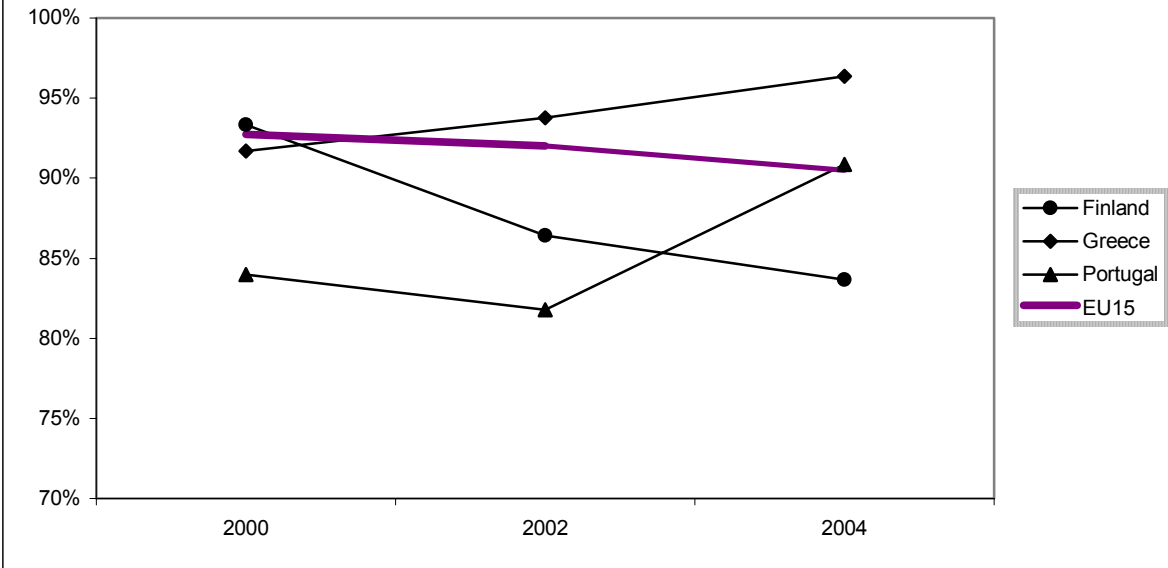


**Figure 2.** Fixed Telephone Service Prices: Fair

**Figure 3.** Fixed Telephone Service Quality: Very Good
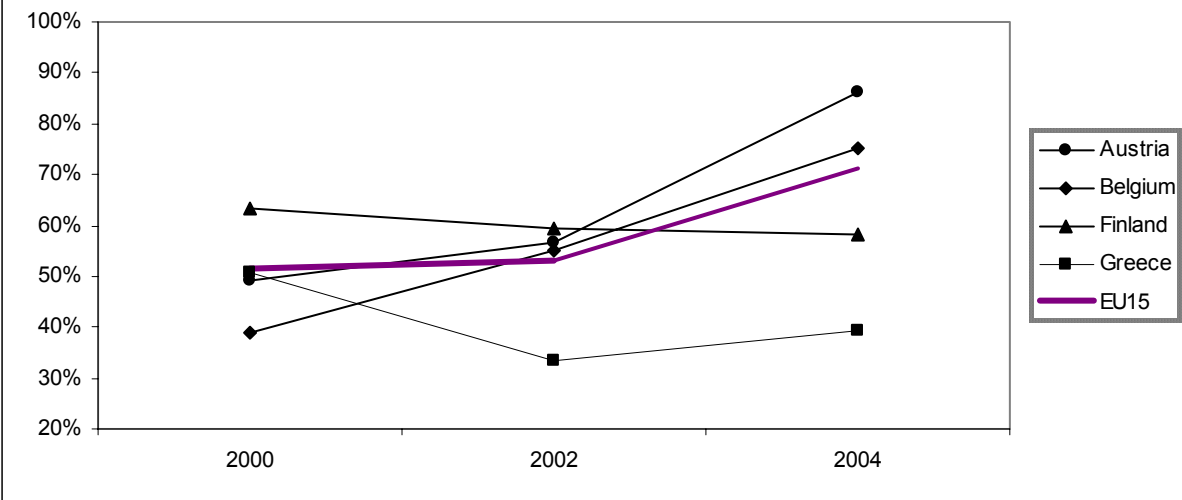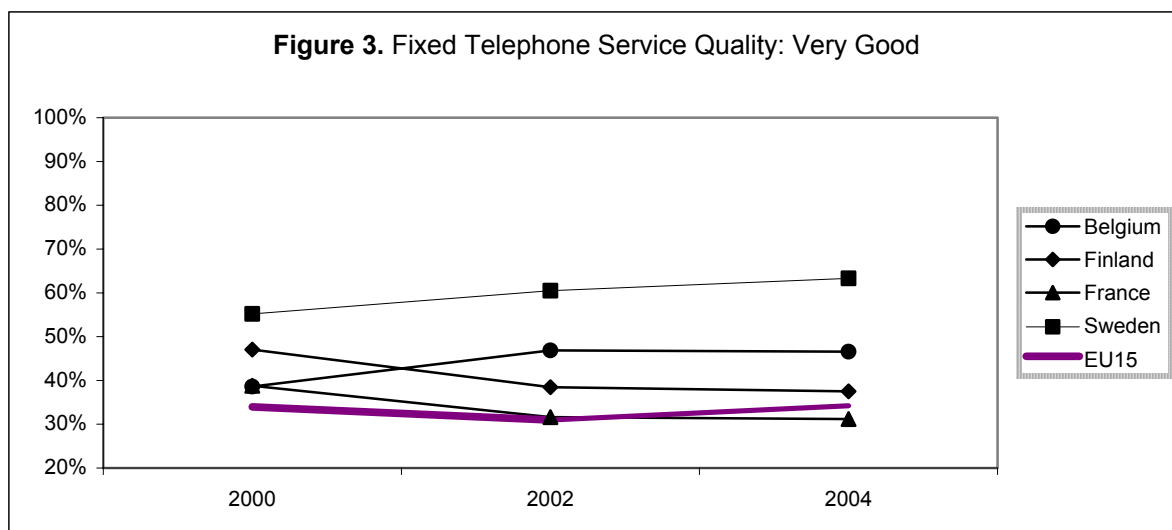


## 4.2. The electricity service

Similar rates of customer satisfaction are recorded in 2000, 2002 and 2004 for electricity service access (Table A4). Denmark and Luxembourg have the better accessibility satisfaction, having a rate of 100% of easy access to electricity network. On the contrary, Greece, Austria and Germany have the worst situation. Considering all the EU15 countries altogether, a percentage of 95.27% of easy access answers is registered in 2000 it decreases during the two following periods (see Figure 4). This tendency is more dramatic in Italy and in Spain than in others EU15 countries: in Italy the percentage of easy access decreases (-10.58% in 2002 and -0.28% in 2004). These trends seem to be counter-intuitive and may need further analysis.

Like in the case of the fixed telephone service, also in the case of the electricity service prices are considered worse than access (Table A5), but ranks in preferences are similar. The overall percentage of fair judgement on service prices is only 58.69%. Among countries, Luxembourg with 83.33% in 2000 has the best rate, whereas Italy (with 20.98% of Excessive and 32.58% of Unfair answers) as well as Portugal (with 11.74% of Excessive and 49.88% of Unfair answers) have the highest rates of unfair and excessive answers about the levels of electricity service prices. In 2004 Belgium registered the highest positive differences in judging prices as fair, whereas Finland and Greece registered the highest negative differences (see Figure 5).

Finally, quality has been judged very or fairly good in Denmark, Sweden and Ireland (Table A6). Quality standards are generally regarded the same way as price levels: overall, a percentage of 95.34% of the EU15 citizens considers very or fairly good the electricity service quality in 2000. This percentage does not significantly change in 2002 and 2004. Germany and Belgium registered the largest increases whereas Austria and Greece registered the lowest ones (see Figure 6).

**Figure 4.** Electricity Service Access: Easy Access
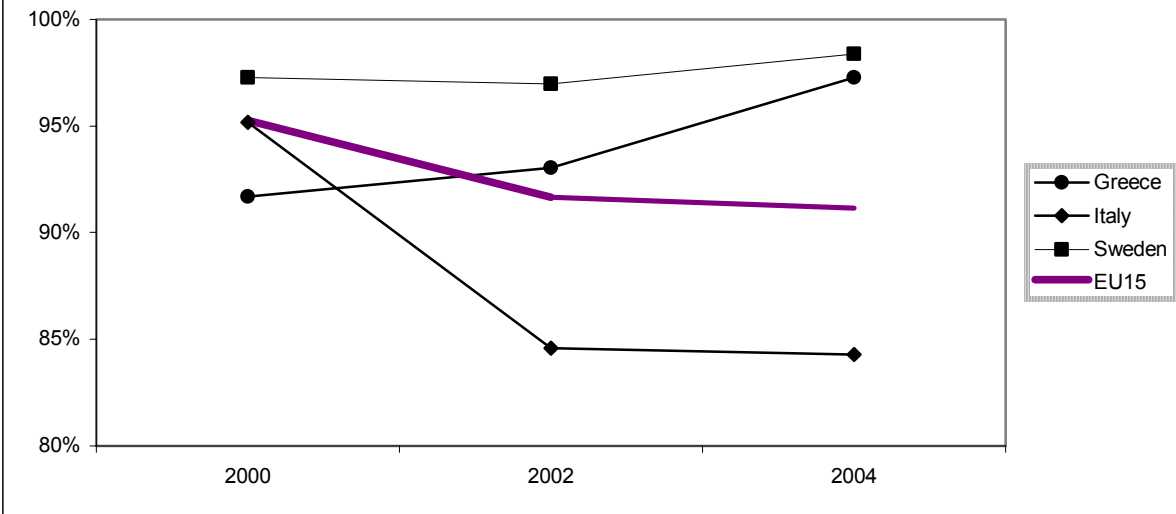


**Figure 5**. Electricity Service Prices: Fair
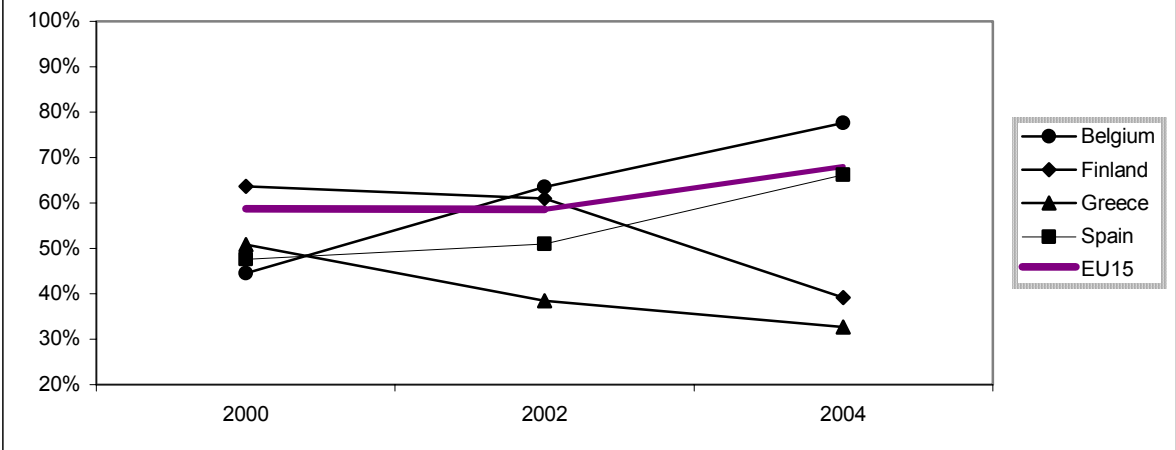


**Figure 6.** Electricity Service Quality: Very Good
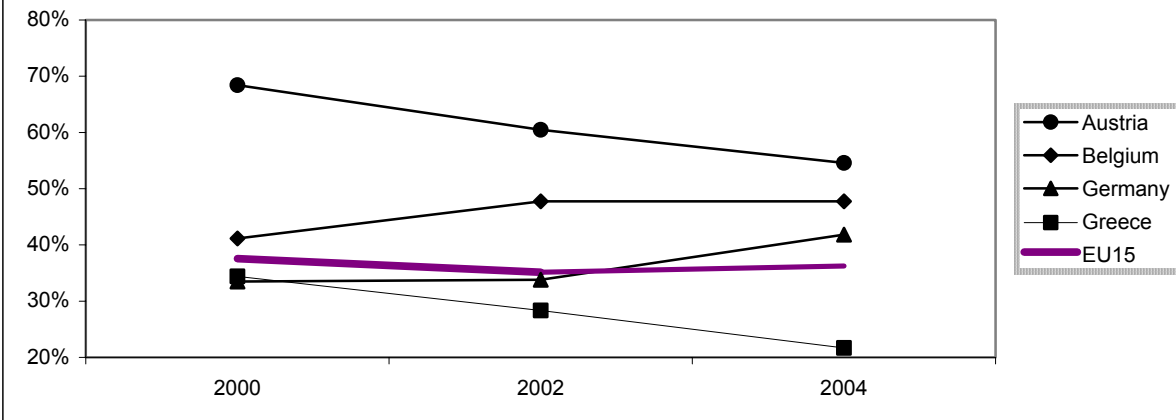
## 4.3. Gas supply services

The analysis on gas supply service is deeply influenced by the large rate of no accessibility recorded in many countries, and in particular for Greece, Finland and Sweden in 2000. The Netherlands in 2000 had the highest rate of easy access to the gas supply service (96.99%) (Table A7). In 2000, Greeks answered that they do not have any access in 96.71% of the cases and Swedes in 91.29% of the cases. Considering all the EU15 countries altogether, a percentage of 81.62% of easy access answers is registered in 2000, whereas in 2002 and 2004 these percentages decrease (-5.36% and -4.08%, respectively). In Figure 7, positive trends are shown for Greece and Ireland and negative trends for Denmark and Finland. No significant difference is reported for Austria, Portugal and Sweden.

Table A8 shows the distribution of fair, unfair or excessive answers on gas supply service prices. The overall percentage of fair judgement on service prices is only 60.84% in 2000, but it increases in 2002 (+1.1%) and in 2004 (+7.86%). Among countries, the top one is Greece with 87.5% in 2000, whereas Italy (with 22.80% of Excessive answers) and Portugal (with 50.46% of Unfair answers) have the lowest fair answer rates. All the significant differences are positive with the best rates for Belgium and Portugal and with the exception of Ireland. The main trends are sketched in Figure 8.

Service quality has been judged fairly or very bad in Italy, Portugal and Greece and very or fairly good in countries like Denmark, Sweden and Ireland (Table A9). Quality standards are generally considered almost in the same way as price levels: overall, a percentage of 94.32% of the EU15 citizens considers very or fairly good the gas supply service quality in 2000. This percentage does not significantly change in 2002 and 2004. With regard to single countries, most of the citizens do not significantly change opinion during the period. However, Greece and Sweden registered an increase of favourable opinions, whereas opinions in Ireland and Italy have decreased during the period.



**Figure 7**. Gas Supply Service Access: Easy Access

**Figure 8**. Gas Supply Service Prices: Fair



**Figure 9.** Gas Supply Service Quality: Very Good
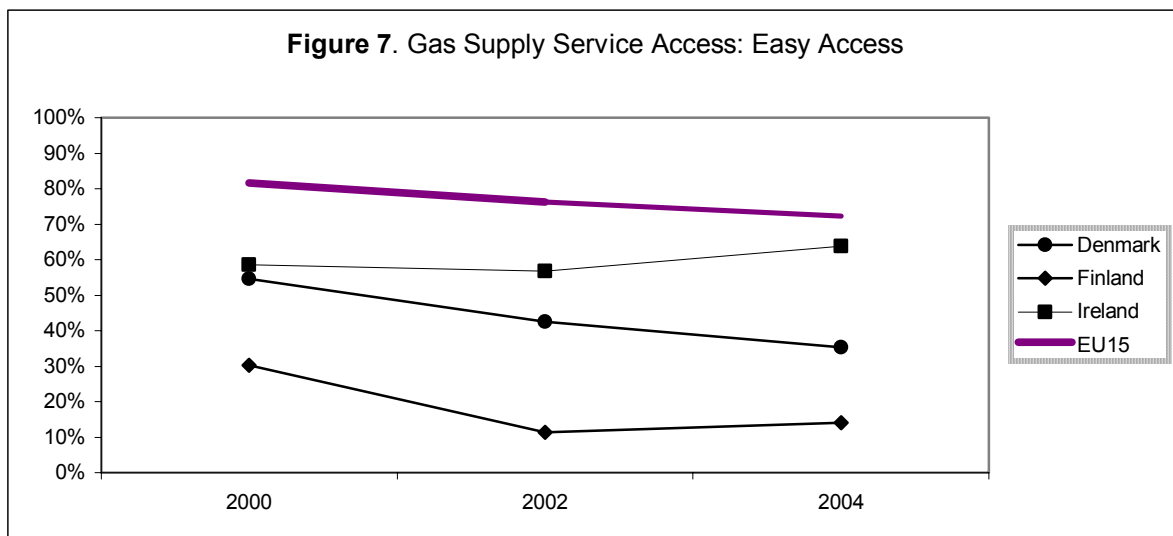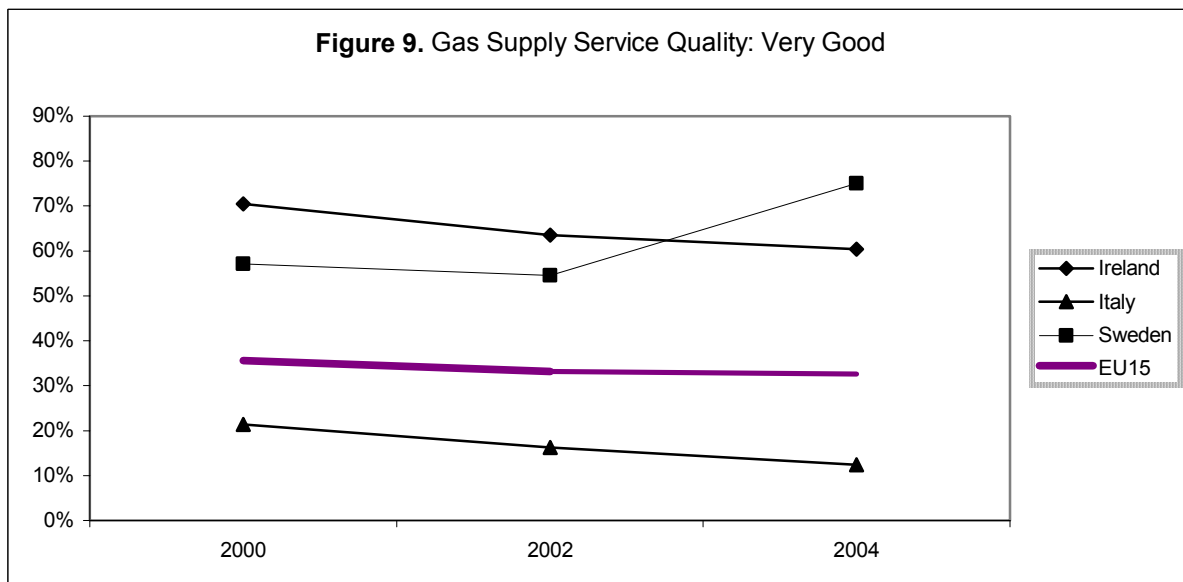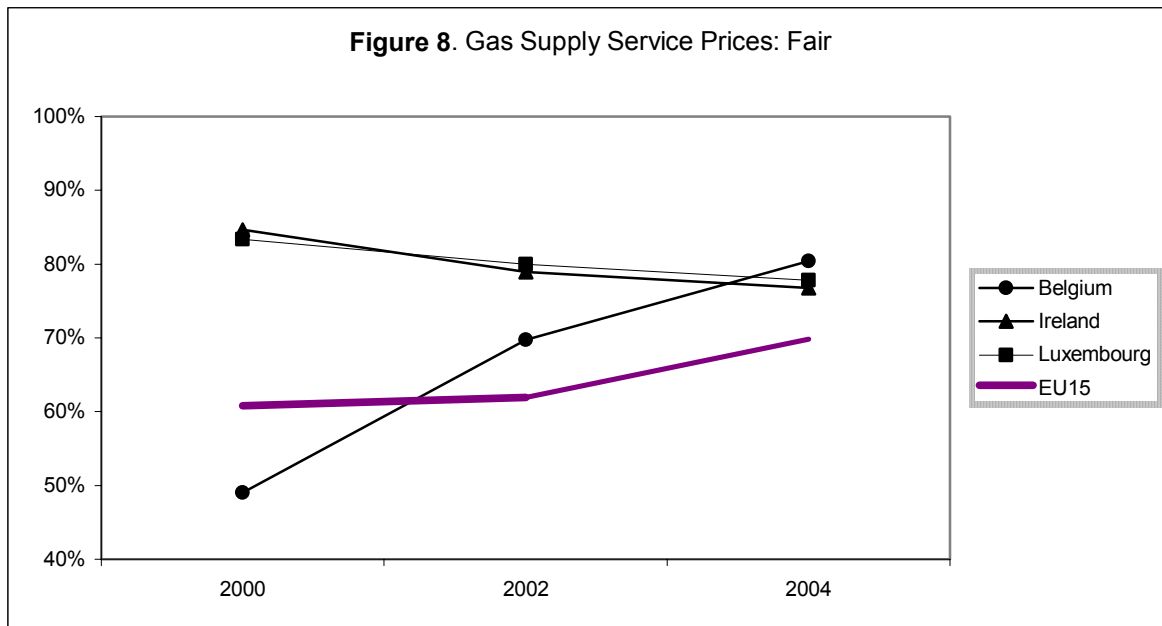


From previous analysis, we can observe that for all three services (fixed telephone, electricity, gas supply) satisfaction of European citizens with regard to access seems in general decreasing in the last years. They are instead more satisfied about the price. No significant variation in their opinion about quality of services has emerged for fixed telephone service, while a decreasing satisfaction is observed for electricity and gas supply service.

## 5.    A conditional analysis of consumers' satisfaction

Although informative, the results presented in previous section are unconditional to other individual and country-specific characteristics and do not allow one to see whether there is any pattern in satisfaction across groups of consumers and across countries. In this section we try to shed some light on this issue. We analyse consumers' satisfaction with fixed telephone, gas, water and electricity supply across the dimensions of access, prices and quality, depending on a set of information about each respondent and the country she lives in.

As satisfaction to different SGI are coded with ordinal variables, we use an ordered logit model for each of them, across the dimension of access, price and quality. By using this model we assume that the true level of satisfaction for each service and each dimension, $S^*$, is unknown and is determined by

$$S^* = \mathbf{x}\boldsymbol{\beta} + e, \quad e \mid \mathbf{x} \sim \Lambda(0, \pi/\sqrt{3}) \qquad (1)$$

where $\boldsymbol{\beta}$ is $K \times 1$, $\mathbf{x}$ does not contain a constant, and $\Lambda(0, \pi/\sqrt{3})$ stands for standard logistic distribution. Hence, we define our stated level of satisfaction $S$ as:

$$
\begin{aligned}
S = 0 \quad &\text{if} \quad S^* \leq \alpha_1 \\
S = 1 \quad &\text{if} \quad \alpha_1 < S^* \leq \alpha_2 \\
&\quad\vdots \\
S = J \quad &\text{if} \quad S^* > \alpha_J
\end{aligned}
$$

where $\alpha_1 < \alpha_2 < ... < \alpha_J$ are unknown cut points. As satisfaction on SGI access takes three values (no access, difficult and easy access), on SGI prices takes three values (excessive, fair, unfair) and on SGI quality takes four values (very bad, fairly bad, fairly good, very good), $J = 2$ for access and price satisfaction and $J = 3$ for quality satisfaction.

As controls, $\mathbf{x}$, we used a set of individual characteristics (including sex, age, marital status, age when finished education, occupation, political views, contribution to household income, and household income, respondent's cooperation as assessed by interviewer), of country fixed-effects, year dummies, some country-level macroeconomic variables (GDP per capita, Gini index, population density, public procurement values, social benefits, subsidies to producers, total government expend.s and revenues) and some regulatory indicators of entry regulation, public ownership, market structure and vertical integration.

All information about individual characteristics are provided by Eurobarometer databases EB53 (for year 2000), EB58 (for year 2002) and EB61.2 (for year 2004). Although the structure of the questionnaire has remained substantially unchanged across these three years, in the 2004 issue there is no information about economic variables (respondent's contribution to household income and household income): when these important variables are included in the model, the whole EB62.1 is left out of the analysis and comparisons of remaining coefficients across models are exploited for assessing robustness of results. Macroeconomic variables are obtained by Eurostat. Regulatory variables are obtained by REGREF, an OECD regulatory database (Conway and Nicoletti, 2006). In particular, we used the variable "entry regulation", which is a weighted average of legal conditions of entry in a market and is coded from 0 (free entry) to 6 (franchised to one firm), available for telephone, gas and electricity; the variable "vertical integration", which is an indicator of vertical separation in different industries and is coded from 0 (ownership separation) to 6 (integration), available for electricity and gas; the variable "market structure", which is an indicator of the market share of the incumbent and is coded from 0 (less than 50%) to 6 (more than 90%), available for telephone and gas; the variable "public ownership", which measures the public ownership of each SGI and is coded from 0 (private ownership) to 6 (public ownership), available for telephone, gas and electricity. Unfortunately, none of these regulatory variables are available for water supply. In the present analysis we considered these variables lagged one period for each year (i.e. for years 1999, 2001 and 2003), as interviews were run before years 2000, 2002 and 2004 were completely over.

All models were estimated by maximum likelihood using pooled datasets and a year-fixed effect dummy was introduced to capture any trend.

Tables 1-3 present results, where coefficients reported are the coefficients of model (1): although they cannot be interpreted as marginal effects and their magnitude has no economic meaning, a positive sign shows that the $J$ outcome is more likely and a negative sign shows that the outcome 0 is more likely.

Looking at personal characteristics, we can notice that:

- on average female with respect to males are significantly less satisfied with prices for all SGI considered, more satisfied with telephone access, while there is no significant particular difference of opinion as far as quality is concerned.

- The older the respondent, the smaller is the satisfaction with prices and the larger that with access.

- Regardless of the SGI considered, more educated people are more satisfied with access and prices than people who exited the education system at younger age, although there is no significant difference concerning quality satisfaction.

- Looking at occupation variables, holding self-employment as the reference category, managers are more likely to be very satisfied than others with telephone, managers and other white collars are more likely to be very satisfied with price and quality of gas supply and managers, other white collars and manual workers are more satisfied with prices of electricity. Unemployed people consistently across SGI are more dissatisfied and students more satisfied than self-employed, especially with respect to price.

- As the Eurobarometer data sets also contain a question asking whether respondents have political views closer to the right or to the left, we also introduced this variable as control, finding that those who are closer to the right tend to complain the least..

- With respect to those giving excellent or fair collaboration to the interviewer, the lower the collaboration the more likely tend to be the individual dissatisfaction for different services, regarding quality, access and prices.

- Finally, looking at household income, which is recorded only for the first two surveys, results show that the level of satisfaction is higher the larger is total purchasing power.

Let us now look at country fixed-effects. Country coefficients show that there is large variability of consumers' satisfaction looking at different countries across SGI. However, the main message they convey is that the variability across countries is a lot more complex that it seemed using an unconditional analysis as in previous section. Holding the UK as the reference country, which seemed to score among the best without conditioning for individual and country characteristics and which is a benchmark in terms of privatization, liberalization and vertical disintegration policies, one can verify that British consumers are still among the most satisfied for some services, like for instance for telephone price. However, this is not true anymore for other issues, such as telephone quality, gas price, electricity price and quality, where several positive coefficient for country-fixed effects are significantly different from zero.

Looking at macroeconomic indicators, results show that the higher is the population density and the rate of growth of GDP, the more likely seems to be consumer satisfaction, although GDP levels, employment growth rate and Gini index coefficients do not provide the same message for all services.

We turn now to our main research: privatization and regulatory reforms. Regulatory variables show some interesting results. As for telephone services, the closer to free entry the telephone market is, the more consumers are satisfied with access, although satisfaction with price is instead reduced. Interestingly, in countries where public ownership is large, consumers are more satisfied with the telephone service price.

As for gas supply, in countries with free entry into the market consumers are less likely to be satisfied with price, although satisfaction tends to be larger for access and quality. Surprisingly, the larger the share of the incumbent, the larger is satisfaction with respect to quality. Vertical integration results to have a negative impact on access, price and quality satisfaction. Differently from telephone services, the larger the share of public ownership in the industry, the more consumers are likely to be dissatisfied.

Finally, with respect to electricity, the results are counterintuitive: the larger is the public ownership, the more likely is consumer satisfaction, the more regulated is the entry, the higher is satisfaction with quality, the larger is vertical integration the higher is satisfaction with access.

Although the time series considered is very short and any hint of a trend should be taken with caution, consumer satisfaction seems to improve, especially as far as prices and quality are concerned, across all SGI considered.

**Table 1: Ordered logit analysis of consumer satisfactions about fixed telephone**

| | Tel. Access | Tel. Access | Tel. Price | Tel. Price | Tel. Quality | Tel. Quality |
|---|---|---|---|---|---|---|
| *Individual characteristics* | | | | | | |
| female | 0.146*** | 0.023 | -0.072** | -0.058 | 0.000 | 0.023 |
| age | 0.016 | 0.034*** | -0.033*** | -0.036*** | -0.005 | -0.011 |
| age squared | 0.000 | -0.000* | 0.000*** | 0.000*** | 0.000 | 0.000* |
| single | -0.293*** | -0.131 | 0.022 | 0.058 | -0.087* | -0.084 |
| separated/divorced/widowed | -0.499*** | -0.303*** | -0.180*** | -0.086 | -0.109** | -0.053 |
| age when finished education | 0.039*** | 0.156*** | 0.037*** | 0.058*** | -0.008 | -0.003 |
| (age when finished education) squared | -0.000*** | -0.004*** | -0.000*** | -0.001** | 0.000 | 0.000 |
| manager | 0.026 | -0.064 | -0.099 | -0.138 | 0.060 | 0.137 |
| other white collar | -0.114 | -0.272* | -0.051 | -0.093 | 0.035 | 0.004 |
| manual worker | -0.137 | -0.199 | -0.075 | -0.079 | -0.051 | -0.034 |
| house person | -0.403*** | -0.311** | -0.047 | -0.070 | 0.060 | 0.110 |
| unemployed | -0.488*** | -0.400** | -0.323*** | -0.226** | -0.140* | -0.100 |
| retired | -0.145 | -0.103 | -0.112 | -0.076 | -0.018 | 0.011 |
| student | 0.688*** | 1.625*** | 0.571*** | 0.681*** | -0.009 | -0.025 |
| political views: right | 0.277*** | 0.251*** | -0.037 | -0.044 | 0.099*** | 0.073 |
| respondent's cooperation: average/bad | -0.401*** | -0.231*** | -0.131*** | -0.117** | -0.099** | -0.070 |
| resp. contrib. to hh income: least | | 0.276*** | | 0.041 | | -0.021 |
| resp. contrib. to hh income: equal | | 0.158 | | -0.047 | | -0.074 |
| Household income: II quartile | | 0.390*** | | 0.217*** | | 0.122* |
| Household income: III quartile | | 0.587*** | | 0.117** | | 0.098* |
| Household income: IV quartile | | 0.576*** | | 0.367*** | | 0.270*** |
| *Country fixed-effects* | | | | | | |
| Belgium | -5.857** | 17.233*** | -1.911 | -5.245** | -1.496 | 0.603 |
| Denmark | 9.883*** | -16.184** | -1.524 | 3.472 | 1.376 | -0.756 |
| Germany | 1.408** | -0.019 | -1.325*** | -0.701 | -0.574** | -0.881* |
| Greece | 7.251* | -20.925** | -3.385 | 2.703 | 0.411 | -3.057 |
| Italy | 2.788** | -6.424** | -2.903*** | -0.594 | -1.329** | -1.851 |
| Spain | 7.986* | -22.397** | -2.822 | 3.441 | 0.144 | -2.742 |
| France | 10.065** | -21.861** | -2.693 | 3.224 | 1.079 | -2.054 |
| Ireland | 12.020** | -29.615*** | -2.137 | 5.629 | 1.983 | -2.358 |
| Luxembourg | | | | | | |
| Netherlands | -12.720* | 39.769*** | -0.910 | -9.016 | -2.825 | 2.264 |
| Portugal | 5077.000 | -17.940** | -2.590 | 2.334 | -0.265 | -2.633 |
| Finland | 14.419** | -35.977*** | -2.601 | 6.378 | 2.219 | -2.758 |
| Sweden | 16.076** | -33.106** | -2.646 | 6.144 | 2.782 | -2.189 |
| Austria | 10.877*** | -22.922** | -2.437 | 3.279 | 1.692 | -1.686 |
| *Year dummies* | | | | | | |
| year 2002 | 0.946*** | -0.312 | 0.398*** | 0.278* | 0.089 | 0.328** |
| year 2004 | 0.132 | | 1.130*** | | 0.106 | |
| *Macro-economic controls* | | | | | | |
| Population Density | 0.064** | -0.164*** | -0.003 | 0.035 | 0.012 | -0.010 |
| GDP, per capita | -0.079*** | 0.091** | -0.007 | -0.024* | -0.003 | 0.004 |
| GDP growth rate | 0.384*** | -0.036 | 0.055 | 0.118** | 0.084** | 0.226*** |
| Employment growth rate | 0.176*** | 0.090 | -0.017 | -0.108*** | -0.015 | -0.117*** |
| Gini | 0.082** | 0.181*** | -0.066*** | -0.046* | -0.037* | -0.007 |
| *Regulation variables* | | | | | | |
| Public Ownership: Tel | -0.048 | 0.174 | 0.071* | 0.105* | -0.088** | 0.073 |
| Entry Regulation: Tel | -0.109*** | -0.005 | 0.098*** | -0.044* | 0.014 | -0.006 |
| Market Structure: Tel | -0.003 | -0.493*** | 0.086 | 0.002 | 0.078 | 0.012 |
| Observations | 43758 | 29547 | 39414 | 27604 | 39788 | 27915 |
| Robust p values in brackets | | | | | | |

* significant at 10%; ** significant at 5%; *** significant at 1%

**Table 2: Ordered logit analysis of consumer satisfactions about gas supply**

| | Gas Access | Gas Access | Gas Price | Gas Price | Gas Quality | Gas Quality |
|---|---|---|---|---|---|---|
| *Individual characteristics* | | | | | | |
| female | 0.022 | 0.147** | -0.088** | -0.093* | -0.005 | 0.019 |
| age | 0.018** | 0.028*** | -0.022*** | -0.020** | 0.002 | 0.000 |
| age squared | -0.000*** | -0.000*** | 0.000*** | 0.000** | 0.000 | 0.000 |
| single | -0.117** | -0.061 | 0.026 | 0.050 | -0.107* | -0.139** |
| separated/divorced/widowed | 0.019 | 0.044 | -0.016 | 0.064 | -0.061 | -0.027 |
| age when finished education | 0.029*** | 0.036 | 0.039*** | 0.066** | 0.016* | 0.046 |
| (age when finished education) squared | -0.000*** | -0.001 | -0.000*** | -0.001* | -0.000** | -0.001 |
| manager | 0.095 | 0.052 | 0.227*** | 0.222** | 0.111 | 0.155 |
| other white collar | 0.035 | 0.026 | 0.145* | 0.175* | -0.008 | -0.017 |
| manual worker | -0.041 | -0.042 | 0.032 | 0.110 | -0.032 | -0.021 |
| house person | -0.039 | 0.106 | 0.237*** | 0.253** | 0.104 | 0.163 |
| unemployed | -0.267*** | -0.104 | -0.162* | -0.123 | -0.113 | -0.097 |
| retired | -0.015 | 0.043 | 0.139 | 0.199* | 0.111 | 0.158 |
| student | 0.534*** | 0.627* | 0.783*** | 1.052*** | 0.320* | 0.590* |
| political views: right | -0.042 | -0.075 | -0.023 | -0.052 | 0.074 | 0.049 |
| respondent's cooperation: average/bad | -0.046 | 0.068 | -0.166*** | -0.154** | -0.122** | -0.121* |
| resp. contrib. to hh income: least | | -0.198*** | | 0.060 | | -0.028 |
| resp. contrib. to hh income: equal | | -0.006 | | 0.105 | | 0.104 |
| Household income: II quartile | | 0.212*** | | 0.134* | | 0.054 |
| Household income: III quartile | | 0.253*** | | 0.000 | | -0.029 |
| Household income: IV quartile | | 0.235** | | 0.141* | | 0.204** |
| *Country fixed-effects* | | | | | | |
| Belgium | -3.816* | 16.343*** | -4.955*** | -3.695 | 2.597* | 6.655** |
| Denmark | 3.488 | -23.445*** | 7.312*** | 13.653*** | -3.747** | -3.929 |
| Germany | 0.400 | | 1.139* | | 0.287 | |
| Greece | 3.371 | -31.757*** | 10.515*** | 11.436** | -8.061*** | -12.768*** |
| Italy | 2.746*** | -8.614*** | 2.107*** | 5.957*** | -3.318*** | -2.769* |
| Spain | 7.244** | -27.167*** | 8.127*** | 9.638** | -6.544*** | -10.956*** |
| France | 7.505*** | -26.082*** | 8.433*** | 13.925*** | -5.932*** | -8.563** |
| Ireland | 7.073* | -36.431*** | 8.772*** | 12.566** | -6.622*** | -12.477** |
| Luxembourg | 1.168 | -20.660*** | -1.428 | 10.071*** | -1.991 | -0.916 |
| Netherlands | -8.076* | 42.206*** | -10.797*** | -9.227 | 7.476** | 16.286*** |
| Portugal | 5.986** | -21.301*** | 8.086*** | 9.602*** | -6.988*** | -9.821*** |
| Finland | 7.392 | -44.610*** | 11.520*** | 16.969** | -9.242*** | -14.824** |
| Sweden | 5.465 | -45.396*** | 11.401*** | 15.450** | -7.070** | -13.388** |
| Austria | 6.421** | -27.610*** | 7.406*** | 12.177*** | -4.646** | -7.788* |
| *Year dummies* | | | | | | |
| year 2002 | -0.366*** | -0.095 | 0.587*** | 1.746*** | 0.411*** | 1.138*** |
| year 2004 | -0.743*** | | 0.486*** | | 0.461*** | |
| *Macro-economic controls* | | | | | | |
| Population Density | 0.042** | -0.181*** | 0.049*** | 0.059** | -0.032** | -0.062** |
| GDP, per capita | 0.018 | 0.063*** | 0.051*** | -0.046* | -0.007 | -0.044** |
| GDP growth rate | 0.142*** | 0.157* | 0.245*** | 0.840*** | 0.254*** | 0.535*** |
| Employment growth rate | -0.053 | -0.157** | -0.007 | -0.181*** | -0.135*** | -0.149*** |
| Gini | 0.087*** | 0.027 | 0.079*** | 0.090*** | 0.020 | 0.013 |
| *Regulation variables* | | | | | | |
| Entry Regulation: Gas | 0.134*** | 0.027 | -0.045** | -0.437*** | 0.048** | -0.283*** |
| Market Structure: Gas | 0.020 | 0.838*** | 0.044 | -0.832*** | 0.413*** | 0.145 |
| Vertical Intergration: Gas | -0.365*** | -0.168* | -0.032 | 0.482*** | -0.089* | 0.466*** |
| Public Ownership: Gas | -0.188*** | -0.322*** | -0.192*** | -0.288*** | 0.050 | -0.050 |
| Observations | 41395 | 27574 | 24376 | 17755 | 25030 | 18364 |
| Robust p values in brackets | | | | | | |

* significant at 10%; ** significant at 5%; *** significant at 1%

**Table 3: Ordered logit analysis of consumer satisfactions about electricity supply**

| | Electr. Access | Electr. Access | Electr. Price | Electr. Price | Electr. Quality | Electr. Quality |
|---|---|---|---|---|---|---|
| *Individual characteristics* | | | | | | |
| female | 0.022 | 0.014 | -0.067** | -0.065 | 0.006 | 0.046 |
| age | 0.048*** | 0.033** | -0.021*** | -0.020*** | -0.004 | -0.008 |
| age squared | -0.000*** | -0.000* | 0.000*** | 0.000*** | 0.000 | 0.000 |
| single | -0.047 | -0.030 | 0.023 | 0.039 | -0.072* | -0.093* |
| separated/divorced/widowed | -0.211*** | -0.204* | -0.052 | 0.007 | -0.053 | -0.040 |
| age when finished education | 0.023** | 0.059 | 0.036*** | 0.083*** | 0.010 | 0.009 |
| (age when finished education) squared | -0.000*** | -0.002 | -0.000*** | -0.002*** | 0.000 | 0.000 |
| manager | -0.075 | -0.086 | 0.228*** | 0.221*** | 0.068 | 0.179** |
| other white collar | -0.075 | -0.038 | 0.098 | 0.098 | -0.063 | -0.034 |
| manual worker | 0.071 | -0.099 | 0.067 | 0.129* | -0.032 | -0.005 |
| house person | -0.007 | 0.030 | 0.181*** | 0.228*** | 0.018 | 0.101 |
| unemployed | 0.228 | 0.254 | -0.124 | -0.056 | -0.058 | -0.048 |
| retired | 0.080 | -0.015 | 0.123* | 0.224*** | 0.038 | 0.092 |
| student | 0.279 | 0.299 | 0.821*** | 1.245*** | 0.227* | 0.174 |
| political views: right | 0.077 | 0.031 | -0.040 | -0.078* | 0.087** | 0.063 |
| respondent's cooperation: average/bad | -0.343*** | -0.209** | -0.210*** | -0.192*** | -0.112** | -0.075 |
| resp. contrib.. to hh income: least | | 0.022 | | 0.019 | | -0.074 |
| resp. contrib.. to hh income: equal | | 0.049 | | 0.059 | | 0.038 |
| Household income: II quartile | | 0.426*** | | 0.146** | | 0.077 |
| Household income: III quartile | | 0.431*** | | 0.033 | | -0.002 |
| Household income: IV quartile | | 0.372*** | | 0.190*** | | 0.161** |
| *Country fixed-effects* | | | | | | |
| Belgium | -3.087 | 4.622 | -10.955*** | -14.404*** | -3.050* | -1.814 |
| Denmark | 4.592 | 0.256 | 8.780*** | 15.846*** | 4.250** | 4.812 |
| Germany | -0.996 | -0.093 | -1.130*** | 0.840 | -0.660* | 0.515 |
| Greece | -1.182 | -10.743 | 11.450*** | 18.772*** | 1.134 | 2.095 |
| Italy | -0.895 | -1.419 | 1.337 | 4.620*** | -0.893 | 0.130 |
| Spain | 0.929 | -8.061 | 12.816*** | 20.580*** | 2.711 | 3.289 |
| France | 1.597 | -5.007 | 10.396*** | 18.300*** | 2.881 | 3.594 |
| Ireland | 3.621 | -7.889 | 15.082*** | 23.609*** | 5.477* | 4.302 |
| Luxembourg | 7.703** | | | | | |
| Netherlands | -5.071 | 12.549 | -22.614*** | -31.347*** | -6.051 | -4.087 |
| Portugal | -0.303 | -7.671 | 9.656*** | 15.589*** | 0.139 | 1.050 |
| Finland | 4.709 | -8.931 | 17.994*** | 29.795*** | 5.870 | 5.988 |
| Sweden | 5.798 | -8.076 | 17.497*** | 29.150*** | 6.486* | 6.675 |
| Austria | 3.234 | -5.010 | 10.836*** | 18.732*** | 4.441* | 4.776 |
| *Year dummies* | | | | | | |
| year 2002 | 0.774*** | 0.410 | -0.190* | 0.176 | -0.008 | 0.230 |
| year 2004 | 0.314 | | 0.166* | | -0.012 | |
| *Macro-economic controls* | | | | | | |
| Population Density | 0.024 | -0.044 | 0.090*** | 0.135*** | 0.028* | 0.023 |
| GDP, per capita | -0.056*** | -0.063** | 0.002 | -0.005 | -0.031*** | 0.001 |
| GDP growth rate | 0.359*** | 0.735*** | -0.077** | 0.157** | 0.050 | 0.243*** |
| Employment growth rate | 0.166*** | -0.413*** | -0.046* | -0.128*** | -0.064** | -0.174*** |
| Gini | 0.097** | 0.103 | -0.052** | 0.032 | 0.022 | 0.092*** |
| *Regulation variables* | | | | | | |
| Public Ownership: Ele | 0.212*** | -0.076 | 0.134*** | 0.129*** | 0.133*** | 0.090*** |
| Vertical Intergration: Ele | 0.132*** | 0.053 | 0.004 | -0.103*** | -0.032 | -0.103*** |
| Entry Regulation: Ele | | -0.113 | 0.021 | 0.109*** | 0.098*** | 0.121*** |
| Observations | 44006 | 29378 | 41564 | 28505 | 42548 | 29344 |
| Robust p values in brackets | | | | | | |

\* significant at 10%; ** significant at 5%; *** significant at 1%

# 6. Conclusions

This paper has presented an exploratory analysis of consumers' satisfaction for three utilities in the EU 15 member states. Although an unconditional analysis across countries points out that some countries, notably Italy, Greece and Portugal show a significant extent of

dissatisfaction, once one controls for individual and country fixed-effects the picture is significantly more complex. While some individual characteristics in the samples, and some macroeconomic controls may contribute to explain the degree of satisfaction in Eurobarometer surveys 2002 to 2004, in these concluding remarks we focus on the impact of regulatory variables.

The utility reforms in Europe over the last twenty years have often assumed that efficiency and welfare would be enhanced by two institutional changes: privatization and liberalization. The two reforms are usually considered as related. This is not always true, however because in principle there may be liberalization without (full or partial) privatization of the incumbent; and because there may be privatization without (full or partial) liberalization. In fact across the EU member states and over time we can observe several patterns. Thus, in this paper we ask a simple question: are consumers happier with SGI in countries where these reforms have been implemented? Can we disentangle the effect on attitudes of privatization from liberalization?

a) As for privatization, the OECD variable we use is the share of public ownership in these industries. Rather surprisingly, for telephone price and for electricity access, price and quality, consumers' satisfaction is higher in countries where public ownership is large, but the reverse is true for gas.

b) One obvious measure of liberalization is the market share of the incumbent, and one would expect that the smaller such a share, the more competitive is the market, the lower the price for a given quality, and the higher the access, hence the higher consumers' satisfaction. This expectation is rejected by data for gas quality, where satisfaction is positively correlated with the market share of the incumbent, and in the other cases it is not significant.

c) A second liberalization variable is 'free entry': this works as expected for telephone access and gas price, but not for telephone price, gas access and quality, and electricity quality.

d) Vertical integration has a negative impact if any for gas services satisfaction, but a positive one for electricity services.

Taken together, these results show that the economic, institutional and social environment that shapes attitudes towards services of general interest, is a complex one. While country effects control for unobserved national variables our findings are surprising.

In fact, our empirical analysis shows that any expectation of a simple EU-wide positive linear relation between consumers' satisfaction and the extent of privatization-liberalization-vertical integration reforms is not supported by the available evidence.

We consider these findings with caution for several reasons. First, we need to check more in depth the consistency of sampling over time and across countries. Second, we would check the risk of misinterpretation of the accessibility question, because increasing 'no access' in 2004 as reported in some countries does not seem credible; third, some of the variables in the OECD regulatory database may not fully capture the reforms; fourth, the time structure needs to be handled carefully, because 2000-2004 is a very limited time span for structural reforms; fifth, some of our results might be affected by omitted variable bias and we need also additional research on macroeconomic controls. Finally, in future we need to cross-check

consumers' satisfaction with objective evidence and the welfare effects of reforms. Regulators and policy-makers may be interested to know more on consumers' satisfaction.

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# Appendix

**Table A.1. Valid Answers on *fixed telephone service access***

| | Percentages Year 2000 | | | Differences Easy Access | | |
|---|---|---|---|---|---|---|
| | No Access | Difficult Access | Easy Access | 2002-2000 | 2004-2002 | 2004-2000 |
| Austria | 4.97 | 6.52 | 88.51 | 2.45** | -0.64 | 1.81* |
| Belgium | 1.67 | 4.30 | 94.03 | -8.77*** | 5.25*** | -3.52*** |
| Denmark | 1.36 | 0.45 | 98.18 | -0.42 | -6.47*** | -6.90*** |
| Finland | 1.43 | 5.24 | 93.33 | -6.93*** | -2.76** | -9.69*** |
| France | 1.42 | 2.59 | 96.00 | -3.33*** | -0.03 | -3.35*** |
| Germany | 2.30 | 5.77 | 91.93 | -0.94 | 0.18 | -0.76 |
| Great Britain | 3.07 | 1.91 | 95.01 | -0.61 | 0.89 | 0.28 |
| Greece | 1.57 | 6.73 | 91.70 | 2.06** | 2.60*** | 4.66*** |
| Ireland | 5.33 | 2.67 | 92.00 | 0.05 | 1.28 | 1.33 |
| Italy | 8.95 | 3.67 | 87.38 | 2.63** | -1.93* | 0.70 |
| Luxembourg | 0.00 | 0.00 | 100.00 | 0.00 | -5.56*** | -5.56*** |
| Netherlands | 0.15 | 2.94 | 96.90 | -2.18*** | 0.71 | -1.46** |
| Portugal | 5.34 | 10.69 | 83.97 | -2.17* | 9.07*** | 6.89*** |
| Spain | 0.66 | 5.43 | 93.90 | 0.49 | -15.58*** | -15.08*** |
| Sweden | 2.98 | 1.08 | 95.93 | 1.34** | 1.12** | 2.47*** |
| Total | 3.20 | 4.07 | 92.73 | -0.71*** | -1.53*** | -2.24*** |
| * significant at 10%; ** significant at 5%; *** significant at 1% | | | | | | |

**Table A.2. Valid Answers on *fixed telephone service prices***

| | Percentages Year 2000 | | | Differences Fair | | |
|---|---|---|---|---|---|---|
| | Excessive | Unfair | Fair | 2002-2000 | 2004-2002 | 2004-2000 |
| Austria | 17.29 | 33.56 | 49.15 | 7.47*** | 29.72*** | 37.19*** |
| Belgium | 21.16 | 40.05 | 38.79 | 16.12*** | 20.38*** | 36.50*** |
| Denmark | 5.63 | 34.74 | 59.62 | 17.30*** | 12.09*** | 29.39*** |
| Finland | 1.48 | 34.98 | 63.55 | -4.10** | -1.17 | -5.27*** |
| France | 18.62 | 29.29 | 52.09 | -1.96 | 14.99*** | 13.04*** |
| Germany | 2.56 | 32.71 | 64.72 | 0.72 | 21.42*** | 22.15*** |
| Great Britain | 5.45 | 24.04 | 70.51 | 4.23*** | 14.97*** | 19.19*** |
| Greece | 13.80 | 35.52 | 50.68 | -17.12*** | 5.93*** | -11.19*** |
| Ireland | 12.31 | 23.08 | 64.62 | 2.05 | 3.73** | 5.78*** |
| Italy | 26.24 | 45.25 | 28.51 | -3.11* | 17.45*** | 14.34*** |
| Luxembourg | 16.67 | 11.11 | 72.22 | -11.11*** | 11.11*** | 0.00 |
| Netherlands | 10.34 | 29.94 | 59.72 | 2.13 | 16.11*** | 18.24*** |
| Portugal | 11.93 | 60.24 | 27.83 | 10.33*** | 16.49*** | 26.82*** |
| Spain | 19.45 | 49.52 | 31.02 | 6.18*** | 22.89*** | 29.06*** |
| Sweden | 5.98 | 34.19 | 59.83 | 8.61*** | 11.62*** | 20.23*** |
| Total | 12.99 | 35.36 | 51.65 | 1.56*** | 17.94*** | 19.51*** |
| * significant at 10%; ** significant at 5%; *** significant at 1% | | | | | | |

**Table A.3. Valid Answers on *fixed telephone service quality***

| | Percentages Year 2000 | | | | Differences Very good | | |
|---|---|---|---|---|---|---|---|
| | Very Bad | Fairly Bad | Fairly Good | Very good | 2002-2000 | 2004-2002 | 2004-2000 |
| Austria | 1.03 | 4.11 | 43.15 | 51.71 | -3.38 | 0.14 | -3.24* |
| Belgium | 0.75 | 2.01 | 58.65 | 38.60 | 8.27*** | -0.30 | 7.97*** |
| Denmark | 0.00 | 2.79 | 38.60 | 58.60 | -2.74 | 4.67** | 1.94 |
| Finland | 0.49 | 1.47 | 50.98 | 47.06 | -8.60*** | -0.96 | -9.56*** |
| France | 0.55 | 3.74 | 56.94 | 38.77 | -7.16*** | -0.41 | -7.57*** |
| Germany | 1.02 | 4.57 | 62.61 | 31.80 | -4.53*** | 10.18*** | 5.64*** |
| Great Britain | 0.61 | 3.61 | 48.28 | 47.50 | -0.31 | -3.14* | -3.45** |
| Greece | 1.82 | 7.06 | 62.19 | 28.93 | -3.76** | -2.44 | -6.20*** |
| Ireland | 0.00 | 2.21 | 37.50 | 60.29 | -0.43 | -3.95** | -4.39** |
| Italy | 2.08 | 8.50 | 72.26 | 17.17 | -4.51*** | 0.71 | -3.80*** |
| Luxembourg | 0.00 | 0.00 | 44.44 | 55.56 | 0.00 | -2.61 | -2.61 |
| Netherlands | 0.15 | 2.77 | 44.84 | 52.23 | -11.79*** | 17.83*** | 6.05*** |
| Portugal | 0.30 | 7.90 | 79.03 | 12.77 | -5.18*** | 1.92* | -3.26 |
| Spain | 0.82 | 9.45 | 73.03 | 16.69 | 6.27*** | -0.52 | 5.76*** |
| Sweden | 0.28 | 1.40 | 43.14 | 55.18 | 5.32*** | 2.82* | 8.13*** |
| Total | 0.93 | 5.23 | 59.89 | 33.94 | -2.98*** | 3.26*** | 0.28 |
| * significant at 10%; ** significant at 5%; *** significant at 1% | | | | | | | |

**Table A.4. Valid Answers on *electricity service access***

| | Percentages Year 2000 | | | Differences Easy access | | |
|---|---|---|---|---|---|---|
| | No Access | Difficult Access | Easy Access | 2002-2000 | 2004-2002 | 2004-2000 |
| Austria | 3.36 | 4.89 | 91.74 | 1.07 | -1.82* | -0.75 |
| Belgium | 0.24 | 5.04 | 94.72 | -4.52*** | -0.16 | -4.68*** |
| Denmark | 0.00 | 0.00 | 100.00 | 0.00 | -3.67*** | -3.67*** |
| Finland | 0.48 | 2.88 | 96.63 | -1.92** | -1.19 | -3.12*** |
| France | 0.42 | 2.36 | 97.22 | -4.01*** | -0.07 | -4.08*** |
| Germany | 1.99 | 7.60 | 90.41 | -0.85 | 0.69 | -0.15 |
| Great Britain | 0.33 | 0.71 | 98.96 | -2.82*** | 2.02*** | -0.80** |
| Greece | 0.67 | 7.64 | 91.69 | 1.35 | 4.24*** | 5.5*** |
| Ireland | 0.00 | 1.33 | 98.67 | -0.65 | 0.67 | 0.02 |
| Italy | 0.00 | 4.84 | 95.16 | -10.58*** | -0.28 | -10.86*** |
| Luxembourg | 0.00 | 0.00 | 100.00 | -5.26*** | -0.29 | -5.56*** |
| Netherlands | 0.32 | 2.52 | 97.16 | -4.67*** | -2.38** | -7.05*** |
| Portugal | 0.00 | 3.82 | 96.18 | -5.05*** | 3.97*** | -1.08 |
| Spain | 0.24 | 4.02 | 95.74 | -1.99** | -8.70*** | -10.69*** |
| Sweden | 1.36 | 1.36 | 97.28 | -0.30 | 1.42** | 1.11 |
| Total | 0.71 | 4.03 | 95.27 | -3.61*** | -0.50** | -4.11*** |
| * significant at 10%; ** significant at 5%; *** significant at 1% | | | | | | |

**Table A.5. Valid Answers on *electricity service prices***

| | Percentages Year 2000 | | | Differences Fair | | |
|---|---|---|---|---|---|---|
| | Excessive | Unfair | Fair | 2002-2000 | 2004-2002 | 2004-2000 |
| Austria | 11.15 | 28.98 | 59.87 | 4.54** | 12.36*** | 16.91*** |
| Belgium | 16.95 | 38.57 | 44.47 | 19.04*** | 14.04*** | 33.08*** |
| Denmark | 3.21 | 24.77 | 72.02 | -3.94** | 16.88*** | 12.93*** |
| Finland | 1.47 | 34.80 | 63.73 | -2.75 | -21.80*** | -24.55*** |
| France | 16.85 | 26.11 | 57.04 | -1.42 | 9.87*** | 8.45*** |
| Germany | 3.44 | 35.91 | 60.65 | 1.15 | 8.84*** | 9.98*** |
| Great Britain | 4.63 | 17.83 | 77.54 | 5.71*** | 6.00*** | 11.71*** |
| Greece | 12.13 | 37.08 | 50.79 | -12.27*** | -5.87*** | -18.14*** |
| Ireland | 7.86 | 12.86 | 79.29 | -16.17*** | 7.38*** | -8.78*** |
| Italy | 20.98 | 32.58 | 46.45 | -9.89*** | 12.57*** | 2.68 |
| Luxembourg | 11.11 | 5.56 | 83.33 | -6.86*** | 3.53* | -3.33* |
| Netherlands | 5.32 | 19.63 | 75.04 | -2.33 | 10.74*** | 8.41*** |
| Portugal | 11.74 | 49.88 | 38.39 | 6.73*** | 11.55*** | 18.28*** |
| Spain | 12.75 | 39.58 | 47.67 | 3.27** | 15.21*** | 18.48*** |
| Sweden | 5.40 | 31.25 | 63.35 | -3.01** | -9.21*** | -12.22*** |
| Total | 10.76 | 30.54 | 58.69 | -0.14 | 9.44*** | 9.30*** |
| * significant at 10%; ** significant at 5%; *** significant at 1% | | | | | | |

**Table A.6. Valid Answers on *electricity service quality***

| | Percentages Year 2000 | | | | Differences Very good | | |
|---|---|---|---|---|---|---|---|
| | Very Bad | Fairly Bad | Fairly Good | Very good | 2002-2000 | 2004-2002 | 2004-2000 |
| Austria | 0.00 | 1.86 | 29.72 | 68.42 | -7.95*** | -5.89*** | -13.84*** |
| Belgium | 0.24 | 1.91 | 56.70 | 41.15 | 6.61*** | -0.02 | 6.59*** |
| Denmark | 0.00 | 0.45 | 30.49 | 69.06 | -1.02 | 2.64* | 1.61 |
| Finland | 0.00 | 0.48 | 50.00 | 49.52 | -7.21*** | -3.02* | -10.23*** |
| France | 0.08 | 2.26 | 55.89 | 41.76 | -6.52*** | 3.23* | -3.28* |
| Germany | 0.90 | 5.83 | 59.79 | 33.48 | 0.32 | 8.02*** | 8.34*** |
| Great Britain | 0.63 | 2.40 | 43.85 | 53.12 | -0.78 | -7.26*** | -8.05*** |
| Greece | 0.92 | 7.57 | 57.11 | 34.40 | -6.06*** | -6.66*** | -12.71*** |
| Ireland | 0.00 | 1.34 | 26.85 | 71.81 | -3.60** | -4.76** | -8.36*** |
| Italy | 0.77 | 6.89 | 72.09 | 20.25 | -6.19*** | -0.34 | -6.53*** |
| Luxembourg | 0.00 | 0.00 | 38.89 | 61.11 | -2.29 | -5.88** | -8.17*** |
| Netherlands | 0.16 | 0.95 | 40.03 | 58.86 | -17.21*** | 16.21*** | -1.00 |
| Portugal | 0.24 | 7.18 | 79.43 | 13.16 | -5.24*** | 1.45 | -3.79*** |
| Spain | 0.96 | 3.78 | 74.59 | 20.66 | 5.03*** | -4.41*** | 0.62 |
| Sweden | 0.00 | 2.49 | 37.40 | 60.11 | 4.71** | -4.44** | 0.27 |
| Total | 0.57 | 4.09 | 57.77 | 37.57 | -2.44*** | 1.11** | -1.33*** |
| * significant at 10%; ** significant at 5%; *** significant at 1% | | | | | | | |

**Table A.7. Valid Answers on *gas supply services access***

| | Percentages Year 2000 | | | Differences Easy access | | |
|---|---|---|---|---|---|---|
| | No Access | Difficult Access | Easy Access | 2002-2000 | 2004-2002 | 2004-2000 |
| Austria | 12.64 | 9.39 | 77.98 | -16.73*** | 14.13*** | -2.61* |
| Belgium | 4.68 | 7.39 | 87.93 | -12.15*** | -1.27 | -13.42*** |
| Denmark | 39.18 | 6.19 | 54.64 | -12.14*** | -7.15*** | -19.29*** |
| Finland | 50.34 | 19.46 | 30.20 | -18.81*** | 2.61** | -16.20*** |
| France | 9.77 | 4.00 | 86.23 | -7.52*** | -3.53** | -11.05*** |
| Germany | 13.24 | 9.04 | 77.72 | -7.64*** | -4.29*** | -11.93*** |
| Great Britain | 4.26 | 2.02 | 93.72 | -4.52*** | -6.94*** | -11.46*** |
| Greece | 96.71 | 0.76 | 2.53 | 4.47*** | 3.42*** | 7.89*** |
| Ireland | 36.30 | 5.19 | 58.52 | -1.74 | 7.07*** | 5.33*** |
| Italy | 4.94 | 6.05 | 89.00 | -7.80*** | 4.28*** | -3.52*** |
| Luxembourg | 22.22 | 5.56 | 72.22 | -11.11*** | 3.59 | -7.52*** |
| Netherlands | 0.48 | 2.54 | 96.99 | -5.57*** | -0.86 | -6.42*** |
| Portugal | 9.18 | 9.69 | 81.12 | 2.09 | 0.54 | 2.63* |
| Spain | 1.43 | 7.25 | 91.32 | 1.24 | -16.27*** | -15.03*** |
| Sweden | 91.29 | 2.10 | 6.61 | 0.49 | -0.30 | 0.19 |
| Total | 12.63 | 5.75 | 81.62 | -5.36*** | -4.08*** | -9.44*** |
| *significant at 10%; ** significant at 5%; *** significant at 1% | | | | | | |

**Table A.8. Valid Answers on *gas supply service prices***

| | Percentages Year 2000 | | | Differences Fair | | |
|---|---|---|---|---|---|---|
| | Excessive | Unfair | Fair | 2002-2000 | 2004-2002 | 2004-2000 |
| Austria | 9.78 | 24.46 | 65.76 | -6.12*** | 12.43*** | 6.31*** |
| Belgium | 13.99 | 37.03 | 48.98 | 20.75*** | 10.70*** | 31.45*** |
| Denmark | 3.61 | 21.69 | 74.70 | 2.77* | 9.49*** | 12.26*** |
| Finland | 5.00 | 32.50 | 62.50 | 4.17** | 4.76 | 8.93*** |
| France | 9.93 | 19.92 | 70.14 | -9.75*** | 6.69*** | -3.05* |
| Germany | 3.66 | 38.31 | 58.03 | 3.12** | 4.95*** | 8.07*** |
| Great Britain | 3.76 | 17.32 | 78.92 | 6.01*** | 4.88*** | 10.89*** |
| Greece | 0.00 | 12.50 | 87.50 | -37.50*** | 50.00*** | 12.50*** |
| Ireland | 4.62 | 10.77 | 84.62 | -5.67*** | -2.16 | -7.83*** |
| Italy | 22.80 | 34.69 | 42.50 | -2.40 | 11.19*** | 8.79*** |
| Luxembourg | 8.33 | 8.33 | 83.33 | -3.33* | -2.22 | -5.56 |
| Netherlands | 5.72 | 21.55 | 72.73 | 1.69 | 9.13*** | 10.82*** |
| Portugal | 8.92 | 50.46 | 40.62 | 13.10*** | 5.38*** | 18.48*** |
| Spain | 9.40 | 35.94 | 54.67 | 3.19* | 8.37*** | 11.56*** |
| Sweden | 4.76 | 23.81 | 71.43 | 6.83*** | 1.74 | 8.57*** |
| Total | 9.75 | 29.41 | 60.84 | 1.10 | 7.86*** | 8.96*** |
| *significant at 10%; ** significant at 5%; *** significant at 1% | | | | | | |

**Table A.9. Valid Answers on *gas supply service quality***

| | Percentages Year 2000 | | | | Differences Very good | | |
|---|---|---|---|---|---|---|---|
| | Very Bad | Fairly Bad | Fairly Good | Very good | 2002-2000 | 2004-2002 | 2004-2000 |
| Austria | 2.56 | 2.56 | 36.92 | 57.95 | -5.97*** | 4.78** | -1.19 |
| Belgium | 0.85 | 2.56 | 55.27 | 41.31 | 7.65*** | -0.64 | 7.01*** |
| Denmark | 0.00 | 0.00 | 31.33 | 68.67 | -4.29** | 3.01* | -1.28 |
| Finland | 2.38 | 2.38 | 69.05 | 26.19 | -2.66 | 19.33*** | 16.67*** |
| France | 0.00 | 2.31 | 56.41 | 41.27 | -4.48** | 2.48 | -2.00 |
| Germany | 1.13 | 7.93 | 59.21 | 31.73 | -1.55 | 7.17*** | 5.62*** |
| Great Britain | 1.05 | 2.75 | 42.90 | 53.30 | -1.42 | -6.10*** | -7.52*** |
| Greece | 7.69 | 0.00 | 38.46 | 53.85 | -44.76*** | 65.91*** | 21.15*** |
| Ireland | 0.00 | 2.82 | 26.76 | 70.42 | -6.93*** | -3.15* | -10.08*** |
| Italy | 1.14 | 6.38 | 71.14 | 21.34 | -5.09*** | -3.83*** | -8.93*** |
| Luxembourg | 0.00 | 0.00 | 46.15 | 53.85 | 6.15** | -10.00*** | -3.85 |
| Netherlands | 0.16 | 0.65 | 39.35 | 59.84 | -15.83*** | 16.07*** | 0.24 |
| Portugal | 0.30 | 9.97 | 76.44 | 13.29 | -5.49*** | -0.79 | -6.28*** |
| Spain | 1.81 | 4.92 | 75.00 | 18.26 | 6.27*** | -7.02*** | -0.75 |
| Sweden | 0.00 | 4.76 | 38.10 | 57.14 | -2.60 | 20.45*** | 17.86*** |
| Total | 0.96 | 4.72 | 58.66 | 35.66 | -2.44*** | -0.56 | -3.00*** |
| * significant at 10%; ** significant at 5%; *** significant at 1% | | | | | | | |