

ARE EUROPEANS HAPPY ABOUT SERVICES OF GENERAL INTEREST  
AND THEIR RECENT REFORMS?

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## **1 Research motivation and framework**

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 (Martin, Roma and Vansteenkiste, 2005). 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), 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 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 if any 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

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substantial costs associated to the separation of fixed capital and its operation: these costs that 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.

For instance Table A refer to EU-15 and shows trends of some key reform features the telephone industry in selected years, as assessed by the OECD (Nicoletti and Scarpetta, 2003). It is apparent that, while there is a common direction or reform, substantial variations exist over time and across states. Empirical analysis should exploit this variability.

Table A: An example of policy reforms. The telephone industry in selected years, EU15.

**SECTOR: Telecoms**

Source: The OECD International Regulation Database

**ENTRY REGULATION**

**What are the legal conditions of entry into the trunk telephony market?**

Year	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxemb.	Netherl.	Portugal	Spain	Sweden	UK
1975	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop
1994	Monop	Monop	Monop	Compet	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Compet	Compet
2003	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet
1975	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop
1998	Monop	Monop	Compet	Compet	Compet	Compet	Monop	Duop	Monop	Monop	Compet	Monop	Duop	Compet	Compet
2003	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet
1975	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	Monop	..	..
1996	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Monop	Compet	Compet	Compet	Compet	Compet
2003	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet	Compet

**STATE OWNERSHIP**

**What percentage of shares in the PTO are owned by government?**

Year	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxemb.	Netherl.	Portugal	Spain	Sweden	UK
1975	100	100	100	100	100	100	100	100	100	100	100	100	35	100	100
1996	100	51	51	100	100	74	92	80	50	100	45	51	21	100	1
2003	47	50	0	19	59	43	34	0	0	100	19	7	0	46	0

**What percentage of shares in the largest firm in the mobile telecommunications sector is owned by government?**

1975	100	100	100	100	100	100	100	100	100	100	100	100	35	100	100
1997	100	37	0	100	62	61	65	80	5	100	44	25	0	100	0
2003	47	37	0	19	59	43	34	0	0	100	19	7	0	46	0

**MARKET STRUCTURE**

**What is the market share of new entrants in the trunk telephony market?**

Year	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxemb.	Netherl.	Portugal	Spain	Sweden	UK
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	49	10	37	63	13	35	0	0	16	..	21	12	14	23	43
2003	46	15	37	63	38	40	21	0	25	12	40	9	18	31	46

**What is the market share of new entrants in the international telephony market?**

1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	52	27	56	49	18	64	0	25	37	25	35	19	14	51	62
2003	52	49	49	50	26	60	29	25	50	24	55	25	17	57	64

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 seems 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, see Brau and Florio, 2004). 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 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 of 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.

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 vary basic statistical information on welfare measures, and applied researchers need to rely on crude and highly aggregate data.

One strategy to preserve some micro 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 et al., 2005 for a survey of applied literature). Such methods revolve around eliciting direct information on willingness-to-pay or willingness-to-accept policy changes through surveys on users.

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, forthcoming, 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.

In an ideal natural experiment with stated preferences, the estimation strategy for the determinants of subjective well being differences is not different from a standard program evaluation approach. We assume that identical populations are randomly assigned to  $n$  programs 1, ...,  $N$ , including a do-nothing or placebo program.

On the LHS of the equation to be estimated we sample observations of subjective (objective) individual welfare levels in one space unit, at one moment of time. Typically, objective welfare dependent variables are continuous, while subjective well-being is measured by limited, discrete variables, thus ordered logit or probit estimation is typically best suited. On the RHS there are a set of variables describing the state of the program in that space-time combination, and a set of control variables. If we interpret the changes in time as ‘before-after’ the program, or similarly changes in space as variations in the state of the experiment, the standard approach is to use estimation of difference in difference (before  $b$ -after  $a$ , and with -without program or with treatment,  $t$  or for the control group  $c$ ), holding for expected values of the observations:

$$\beta_1 = (EY^{t,a} - EY^{t,b}) - (EY^{c,a} - EY^{c,b}) = \Delta EY^t - \Delta EY^c = \Delta EY_i$$

so that when individuals included in the sample differ by  $W_1 \dots W_r$  characteristics, and there are  $X^1 \dots X^m$  reform characteristics, the standard regression model holds:

$$\Delta Y_i = \beta_0 + \beta_1 X^1 \dots \beta_2 X^m + \beta_{m+1} W_1 + \dots \beta_{m+r} W_r + u_i$$

where  $u_i$  are error terms. Interaction between  $X$  and  $W$  variables will discriminate reform effects across different individual characteristics.

In a natural experiment, however, it is extremely unlikely that the assignment of individuals to programs is perfectly randomized. We can, however, think that the fact that one consumer of electricity is assigned to Italy or the UK and their reform programs, is similar to a random process. In general, quasi randomization arises when changes in institutions, in localization, in timing of policies are exogenous to individual behaviour or characteristics.

When we accept this assumption, we need a suitable set of control variables to counteract population heterogeneity, exactly as in a true experiment when population is not homogenous. Ideally, we would need a rich set of descriptors of individual characteristics, and some time/space related control variables. Panel data econometrics can then be used in a relatively straightforward way. When panel data are not available, we need to turn if possible to repeated cross-section data, to preserve a time dimension to the regression model. The econometrics of quasi-experiments with heterogeneous populations is an active field of research and we can take advantage of recent progress in this area, see Rosenzweig and Wolpin (2000) for a survey article; Shadish, Cook and Campbell (2002), Angrist and Krueger (2001) for IV approaches in this context.

A number of delicate empirical issues to be dealt with arise in this framework (we are not going to address all of them in this exploratory paper). The most important concern is the risk of omitted variables that render inconsistent the estimators. There is also some risk of endogeneity, if individual happiness with a service influences some explanatory variables, e.g. the self-assessment of economic conditions (so that causality runs in both directions).

One important issue to be dealt with is testing the quasi-randomization process: in general the test is by regressing the Xs on the Ws, and looking at the standard errors of estimated parameters for the Ws. For example, if the extent of public ownership or of market openness is correlated with income of the individuals, the quasi randomization fails, because the median Greek citizen will be assigned to a different program as compared with the median Swedish citizen by a biased assignment process.

A preliminary inspection of OECD regulatory data, however, does not allow us to reject the conjecture of a quasi-random reform process across the EU-15 member states. Obviously, even if the W and the X variables are not correlated, they can be correlated to unobserved factors included in the error term. This form of the omitted variable problem, as far as we now, cannot be tested, and should be evaluated qualitatively. We discuss some of these issues in the next sections of the paper.

While interaction terms can control observed heterogeneity in population, with unobserved heterogeneity, there is in principle one estimated coefficient of the reform for each individual type, and we need careful interpretation: for example, OLS estimators are consistent, but should be interpreted as an average effect on the population. However, with limited dependent variables OLS estimators are biased, and maximum likelihood is our first choice (applied happiness economics literature however reports that OLS and ordered probit or logit estimates are very close in most cases).

To sum up: we regard the implementation of reforms of services of general interest in the EU as a natural experiment with heterogeneous population. Each Member States moves along a common policy trend, the privatization-vertical disintegration-liberalization paradigm, as determined by the 'Brussels Consensus', a mixture of legislation and of commonly shared beliefs. There are however strong variations across time and countries in the implementation process. We wish to exploit this variability to evaluate the welfare impact of the program. Moreover, because the program itself can be broken down in sub-programs (divestiture of SGI, opening of markets, separation of production and distribution, establishment of independent regulators, etc), we want to test the direct welfare impact on consumers of the program and of different combinations of its sub-programs. To do so, we ideally would like to measure individual welfare changes as dependent variables, and estimate the marginal impact of reforms. Because good individual objective welfare measures are not available to us, we turn to subjective well being as measured by survey data.

In Section 2 we present the main data set used. In Section 3 we present some descriptive evidence about perception of satisfaction about four SGI (fixed telephone, electricity, gas and water) across the issues of access, price and quality. In Section 4 we develop a model to analyze SGI satisfaction perceptions conditional on individual socio-economic characteristics and estimate a difference-in-difference model for changes in public ownership in the telephone sector and for change of market structure in the gas industry. Section 5 concludes.

## 2 The Eurobarometer data set

The analysis of subjective level of satisfaction about SGI is undertaken by analyzing some special issues of the the Eurobarometer public opinion surveys. Eurobarometer surveys 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 was asked of representative samples of the population aged fifteen years and over in each Member State. The questions are concerning various aspects. The key findings are: Support for EU membership and benefit from EU membership, Image of the European Union, Trust in the Union's institutions, Support for an EU constitution, Satisfaction with EU democracy, The single currency, Enlargement, The European Parliament, The media and EU information, The desired role of the European Union in 5 years, 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 (1300), and Germany (2000).

In years 2000 and 2002 a special issue of the Eurobarometer survey was devoted to opinions about SGI, namely mobile telephone services, fixed telephone services, electricity supply services, gas supply services, water supply services, postal services, transport services within towns/cities and rail services between towns/cities. The criteria used to analyse these services are access to services of general interest, the price of the services, the quality of the services, the 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.

In this paper we considers only fixed telephone services, electricity supply services, gas supply services, water supply services and only the criteria access to services, price and quality. Eurobarometer 53 is carried out between 5 April and 23 May 2000 and Eurobarometer 58 is carried out between 1 September 2002 and 7 October 2002.

A first detailed analysis on the Eurobarometer data can be found on the official Eurobarometer Web site<sup>2</sup>. In standard reports for each country a comparison between the sample and the universe was carried out, as derived from Eurostat population data or from national statistics. For all EU member-countries a national weighting procedure, using marginal and intercellular weighting, was carried out based on this universe description and a set of sampling weights are provided.

The standard Eurobarometer 53.0 and 58.0 covers the population of the European Union Member States, aged 15 years and over, resident in each of the Member States. The basic sample design applied in all Member States is a multistage, random (probability) one. In each EU country, a number of sampling points was drawn with probability proportional to population size (for a total coverage of the country) and to population density. For doing so, the points were drawn systematically from each of the "administrative regional units", after stratification by individual unit and type of area. They thus represent the whole territory of the Member States according to the EUROSTAT NUTS 2 (or equivalent) and according to the distribution of the resident population of the respective EU-nationalities in terms of metropolitan, urban and rural areas. In each of the selected sampling points, a starting address was drawn, at random. Further addresses were selected as every Nth address by standard random route procedures, from the initial address. In each household, the respondent was drawn, at random. All interviews were face-to-face in people's home and in the appropriate national language.

For the year 2000 and 2002 special report editions concerning services of general interest are produced: Eurobarometer report No. 53 entitled "The people of Europe and Services of general interest" (October 2000) and Eurobarometer report No. 58 entitled "Consumers' Opinions about Services of General Interest" (December 2002). In this reports all the answers to the questions on SGI have been harmonised according to two types of answers ("*satisfied*" or "*dissatisfied*"). This

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<sup>2</sup> [http://europa.eu.int/comm/public\\_opinion/](http://europa.eu.int/comm/public_opinion/)



report shows the percentages of “satisfaction” or “dissatisfaction” for each service and, the No. 58 shows also a synopsis of the main trends seen from a comparison of the data for Eurobarometers No. 53 and 58. The “Trend” questions in the aforementioned report<sup>3</sup> will be used as a basis for this comparative analysis. A number of elements underlie the reliability of the comparability of the two Eurobarometers (Nos. 53 & 58): the samples used (15,900 people in 2000 and 16,067 in 2002, see Table B) are valid because they are highly representative of national opinions; the recruitment and makeup of the sample both comply with the rules recognised by the scientific world.

Table B. Sample composition for both 2000 and 2002 survey

	Sample		Weight Sample	
	2000	2002	2000	2002
Austria	1,005	1,008	343	346
Belgium	1,063	1,074	430	460
Denmark	1,000	1,000	223	223
Finland	1,010	1,000	214	214
France	1,002	1,004	2,416	2,426
Germany	2,049	2,045	3,542	3,651
Great Britain	1,370	1,320	2,437	2,472
Greece	1,004	1,001	453	453
Ireland	1,000	999	153	153
Italy	1,000	992	2,523	2,503
Luxembourg	600	599	19	19
Netherlands	975	998	654	654
Portugal	1,000	1,000	423	423
Spain	1,000	1,000	1,700	1,700
Sweden	1,000	1,000	370	370
<b>Total</b>	<b>16,078</b>	<b>16,040</b>	<b>15,900</b>	<b>16,067</b>

### 3 Explorative Analysis

In this section four service of general interest (fixed telephone, electricity, gas supply and water supply) are considered. Cross-country differences on the ease of public service *access*, on the level of public service *prices* and *quality* are here provided. For more details see (Manzi, 2006).

#### 3.1 The fixed telephone service

The lowest rate of accessibility among European customers in 2002 (Table 1) is in Portugal: 8.5% of citizens declared that there is a difficult access and 9.1% that there is no access to fixed telephone network. The access rate is worse than in 2000 when 9.9% of the respondents declared a difficult access and 4.9% even no access to the fixed telephone network. On the opposite, Denmark has the better accessibility, having a rate of 96.8% in 2000 and 97.7% in 2002 of easy access to fixed telephone network. In terms of variation between 2000 and 2002, Belgium has the largest positive difference of difficult or no access to telephone net and Italy the lowest. An overall percentage of 89.3% of easy access answers is registered in 2002, whereas in 2000 the same percentage was 89.6%.

<sup>3</sup> Questions No. 62 (= question No. 2 - EB58.0) , 63 (= question No. 3 - EB58.0), 64 (= question No. 4 - EB58.0), 65 (= question No. 5 - EB58.0), 66 (= question No. 6 - EB58.0) et 67 (= question No. 7 - EB58.0). The only new question is No. 8 which deals with customer service (EB58.0).

Opinion percentages on fixed telephone service prices are worse than the previous ones (Table 2). The overall percentages of fair judgement of service prices are only 48.9% in 2002, even if it is better than in 2000 (47.3%). Among countries, the top ones are Denmark with 71.6% in 2002 and Luxembourg with 68.6% in 2000, whereas Italy (with 24.3% in 2002) and Portugal (with 21.6% in 2000) are not comfortable with the fixed telephone service prices. Greece registered the highest positive difference in judging prices unfair or excessive (+16.1%) and Belgium registered the lowest one (-17.6%). Italy has the highest rates considering unfair or excessive price opinions together.

Finally, quality has judged fairly or very bad in Italy, Greece and Portugal and very or fairly good in countries like Denmark, Spain and Ireland (Table 3). Quality level is generally considered better than price level: overall, a percentage of 86.1% of the EU15 citizens considers very or fairly good the telephone service quality in 2002.

### **3.2 The electricity service**

Similar rates are recorded in 2000 and in 2002 for electricity service. Italy recorded the lowest rate of accessibility to the electricity network among EU15 countries in 2002 (Table 4): 12.1% of Italian citizens declared that there is a difficult access and 2.6% that they don't have any access, whereas in 2000 there were no Italians without access to the service: people in Italy having accessibility problems (difficult or no access to the network) got a raise of 10.1%. On the opposite, Denmark has the better accessibility, having a rate of 100% in 2000 and 99.5% in 2002 of easy accesses to electricity network. Considering all the EU15 countries altogether a percentage of 87.7% of easy access answers is registered in 2002, whereas in 2000 the same percentage was 91.2%. This service lose accessibility power during this period.

As for the fixed telephone service, also for the electricity service price levels are considered worse than the previous ones (Table 5), whereas rankings in preferences are similar. The overall percentages of fair judgement of service prices are only 54.1% in 2002, even worse than in 2000 (54.6%). Among countries, UK with 77.9% in 2002 and Luxembourg with 78.0% in 2000 have the best rates, whereas Italy (with 34.0% in 2002) and Portugal (with 37.2% in 2000) are not comfortable with the levels of electricity service prices. Ireland registered the highest positive difference in judging prices unfair or excessive (+15.1%) and Belgium registered the lowest one (-18.5%). Italy in 2002 and Portugal in 2000 have the highest rates considering unfair or excessive price opinions together.

Finally, quality has been judged fairly or very bad in Italy, Greece, Spain and Portugal (but Portugal has a high rate of fairly good answers) and very or fairly good in Denmark, Sweden and Ireland (Table 6). Quality standards are generally regarded the same way as price levels: overall, a percentage of 89.9% of the EU15 citizens considers very or fairly good the electricity service quality in 2002. The correspondent percentage for prices is 85.5%.

### **3.3 Water and gas supply services**

As for the electricity service, Italy and Denmark have the lowest and the highest rate of accessibility to the water supply service, respectively. In 2002 (Table 7) Italy has a rate of 10.3% of difficult access and a rate of 2.5% of no access, whereas in 2000 nobody declared to have no access to water network. Denmark has the better accessibility, having a rate of 99.8% in 2000 and 99.5% in 2002 of easy accesses to water supply network. Furthermore, Denmark registered a rate of 0% for the no access category. Considering all the EU15 countries together, a percentage of 86% of easy access answers is registered in 2002, whereas in 2000 the same percentage was 89.9%.

Table 8 shows the distribution of the answers on water supply service prices. The overall percentages of fair judgement on service prices are only 54.4% in 2002, even if it is better than in 2000. Among countries, Luxembourg (with 77.4% in 2002 and 81.3% in 2000) has a good rate of

satisfaction, whereas Italy (with 43.1% in 2002 and 44.6% in 2000) has a bad one. Greece registered the highest positive difference in judging prices unfair or excessive (+15.6%) and Belgium registered the lowest one (-12.9%).

Quality has been judged fairly or very bad in Italy, Greece and Portugal (as for the case of electricity service, with Italy in the place of Spain) and very or fairly good in countries like Denmark, Sweden and Ireland (Denmark, for example, took a percentage of 95.5% of very or fairly good answers in 2002, see Table 9). Quality standards are generally considered almost in the same way as price levels: overall, a percentage of 87.2% of the EU15 citizens considers very or fairly good the water supply service quality in 2002.

The analysis on gas supply service is deeply influenced by the large rate of no accessibility recorded in many countries. Denmark, Greece, Finland and Sweden have all rates higher than or near 50% both in 2000 and in 2002 (Table 10). For this reason it is better to exclude from the analysis the *don't know*, *not applicable* and *not available* answers (Table 11). The Netherlands took in 2000 the highest rate of easy accessibility to the gas supply service and Spain in 2002 (96.9% and 92.6% respectively). Greeks answered that they didn't have any access in the 96.8% of the cases in 2000 ( but this percentage decreased until 88.1% in 2002) and Swedish for the 91.3% of the cases in 2002. Considering all the EU15 countries altogether, a percentage of 75.7% of easy access answers is registered in 2002, whereas in 2000 the same percentage was 81.9%. Difficult or no access answers increase is than 6.0%.

Table 12 shows the distribution of fair, unfair or excessive valid answers on gas supply service prices. The overall percentages of fair judgement on service prices are only 61.9% in 2002, better than in 2000 (60.8%). Among countries, the top ones are United Kingdom with 84.9% in 2002 and Greece with 89.2% in 2000 (but excluding missing and don't know answers, the sample for Greece is deeply reduced – Table 13), whereas Italians (with 40.1% in 2002) and Portuguese (with 40.5% in 2000) have the lowest service prices fair rates. Greece registered the highest positive difference in judging prices unfair or excessive (+45.7%) and Belgium registered the lowest one (-20.6%).

Service quality has been judged fairly or very bad in Italy (12.3% of fairly bad answers and 25.4% of very bad answers in 2002) and very or fairly good in countries like Denmark, Sweden and Ireland (Denmark took a percentage of 98.7% of very or fairly good answers in 2002) (Table 14). Quality standards are generally considered almost in the same way as price levels: overall, a percentage of 93.8% of the EU15 citizens considers very or fairly good the gas supply service quality in 2002.

**Table 1. Answers on fixed telephone service access – Years 2000 and 2002 - Percentages**

	2000					2002				
	N.A.	Easy Acc.	Difficult Acc.	No Acc.	DK	Easy Acc.	Difficult Acc.	No Acc.	DK	Diff.
			[A]	[B]			[C]	[D]		[C+D]- [A+B]
B	0.0	92.0	4.2	1.7	2.1	81.8	6.9	7.2	4.1	<b>8.2</b>
DK	0.0	<b>96.8</b>	<b>0.6</b>	1.5	1.0	<b>97.7</b>	<b>0.6</b>	1.6	<b>0.2</b>	0.1
GR	0.0	90.4	6.7	1.5	1.4	92.8	5.0	1.3	0.9	-1.9
I	0.0	85.9	3.6	<b>8.8</b>	1.7	87.9	7.6	2.2	2.4	<b>-2.6</b>
E	0.0	91.4	5.3	0.6	2.6	92.1	5.0	<b>0.4</b>	2.4	-0.5
F	0.0	95.2	2.6	1.4	0.7	90.1	4.1	3.0	2.8	3.1
IRL	0.0	89.7	2.4	5.5	2.5	90.9	1.9	5.7	1.5	-0.3
L	0.0	96.5	1.6	1.2	0.8	94.9	2.2	2.0	0.9	1.4
NL	0.0	95.6	2.9	<b>0.2</b>	1.3	90.8	4.4	0.7	4.1	2.0
P	0.0	<b>78.1</b>	<b>9.9</b>	4.9	<b>7.1</b>	<b>79.7</b>	<b>8.5</b>	<b>9.1</b>	2.6	2.8
FIN	0.0	91.5	4.9	1.5	2.0	83.2	8.2	4.6	4.1	6.4
S	0.0	95.7	1.1	3.1	<b>0.1</b>	96.6	1.2	1.7	0.5	-1.3
A	0.0	82.9	6.0	4.6	6.4	87.4	4.6	4.2	3.8	-1.8
D	1.3	83.7	5.2	2.1	7.7	86.6	6.8	1.8	<b>4.8</b>	1.3
UK	0.0	93.8	1.9	3.0	1.3	92.8	2.6	2.9	1.7	0.6

TOT	0.3	89.6	3.9	3.1	3.1	89.3	5.3	2.5	2.9	0.8
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**Table 2. Answers on fixed telephone service prices – Years 2000 and 2002 - Percentages**

	2000						2002					Diff. (C+D)- (A+B)
	N.Av.	Fair	Unfair	Excess.	DK	Not Appl.	Fair	Unfair	Excess.	DK	Not Appl.	
			[A]	[B]				[C]	[D]			
B	0.0	35.8	37.0	19.6	2.5	5.0	47.3	29.2	9.8	2.4	11.2	<b>-17.6</b>
DK	0.0	56.9	32.9	<b>5.3</b>	2.6	2.3	<b>71.6</b>	19.0	<b>2.1</b>	2.6	4.6	-17.1
GR	0.0	49.5	34.8	13.5	<b>0.8</b>	1.5	32.5	<b>56.6</b>	7.8	1.9	<b>1.2</b>	<b>16.1</b>
I	0.0	25.5	40.4	<b>23.4</b>	1.9	8.8	<b>24.3</b>	47.5	<b>23.9</b>	1.8	2.4	7.6
E	0.0	28.7	45.8	18.0	2.5	5.0	33.7	49.6	7.4	3.1	6.2	-6.8
F	0.0	50.5	28.4	18.0	1.1	2.0	45.5	32.9	12.4	4.4	4.8	-1.1
IRL	0.0	54.6	19.5	10.6	4.1	11.2	59.8	23.5	6.4	<b>4.8</b>	5.6	-0.2
L	0.0	<b>68.6</b>	<b>11.7</b>	15.1	3.2	1.3	60.6	<b>16.3</b>	19.2	2.3	1.6	8.7
NL	0.0	58.3	29.3	10.0	1.6	<b>0.8</b>	58.3	29.1	6.9	3.8	1.9	-3.3
P	0.0	<b>21.6</b>	<b>46.6</b>	9.1	<b>4.2</b>	<b>18.6</b>	25.5	36.2	5.1	2.3	<b>30.9</b>	-14.4
FIN	0.0	60.3	33.2	1.6	1.7	3.3	50.0	33.2	0.7	7.1	9.1	-0.9
S	0.0	56.9	32.5	5.6	1.5	3.6	66.3	28.4	2.2	<b>1.6</b>	1.5	-7.5
A	0.0	42.3	29.0	14.7	3.4	10.6	49.4	32.1	5.8	4.0	8.7	-5.8
D	0.2	57.3	28.7	2.3	6.7	4.9	60.6	28.9	3.2	4.7	2.6	1.1
UK	0.0	65.2	22.3	5.1	2.7	4.7	68.9	20.5	2.8	2.6	5.2	-4.1
TOT	0.1	47.3	32.4	11.9	3.1	5.2	48.9	34.1	8.7	3.4	4.8	-1.5

**Table 3. Answers on fixed telephone service quality – Years 2000 and 2002 - Percentages**

	2000						2002						Diff. [(C+D)- (A+B)]	
	N.A.	V. good	F. good	F. bad	V. bad	DK	Not Appl.	V. good	F. good	F. bad	V. bad	DK		Not Appl.
			[A]	[B]					[C]	[D]				
B	0.0	36.0	54.7	1.8	0.7	1.2	5.6	40.6	44.1	1.7	0.3	2.1	11.2	-0.5
DK	0.0	<b>56.5</b>	37.0	2.6	0.2	1.4	2.2	53.2	39.9	1.9	0.6	0.8	3.7	-0.3
GR	0.0	28.0	60.3	6.9	1.7	1.6	1.5	24.5	59.0	10.3	<b>3.5</b>	1.8	<b>0.8</b>	5.2
I	0.0	15.4	64.7	7.6	<b>1.9</b>	1.6	8.8	12.2	68.3	<b>13.6</b>	2.2	1.3	2.4	<b>6.3</b>
E	0.0	15.5	<b>67.7</b>	<b>8.8</b>	0.8	2.1	5.2	21.4	61.4	9.4	0.8	1.6	5.3	0.6
F	0.0	37.8	55.5	3.6	0.5	0.8	1.7	29.5	59.7	4.0	<b>0.1</b>	2.7	4.1	0.0
IRL	0.0	53.3	<b>33.5</b>	1.8	0.1	1.9	9.4	55.4	34.4	1.7	0.9	1.7	5.9	0.7
L	0.0	55.6	40.6	1.6	<b>0.0</b>	1.0	1.3	53.6	39.6	2.7	0.3	1.3	2.5	1.4
NL	0.0	51.8	44.4	2.7	0.1	<b>0.4</b>	<b>0.6</b>	38.9	53.8	2.8	0.7	1.5	2.4	0.7
P	0.0	<b>9.9</b>	61.6	6.1	0.3	3.9	<b>18.3</b>	<b>5.1</b>	58.9	4.2	0.2	<b>0.5</b>	<b>31.0</b>	-2.0
FIN	0.0	44.6	48.6	1.4	0.2	1.6	3.5	32.6	50.4	1.6	0.7	<b>5.1</b>	9.7	0.7
S	0.0	53.2	41.5	<b>1.2</b>	0.2	0.5	3.3	<b>59.1</b>	36.6	1.8	0.2	1.0	1.2	0.6
A	0.0	44.0	36.8	3.4	1.0	3.0	11.7	42.0	40.6	3.8	0.2	3.7	9.6	-0.4
D	0.9	28.2	55.4	4.0	0.9	<b>7.8</b>	2.8	25.3	<b>60.9</b>	6.1	0.9	4.8	2.0	2.1
UK	0.0	44.8	45.6	3.4	0.6	1.2	4.4	44.5	47.4	1.8	0.6	1.0	4.6	-1.6
TOT	0.2	31.3	55.2	4.8	0.9	2.9	4.7	29.1	57.0	6.1	0.9	2.4	4.4	1.3

**Table 4. Answers on electricity service access – Years 2000 and 2002 - Percentages**

	2000					2002					Diff. [C+D]- [A+B]
	N.A.	Easy Acc.	Difficult Acc.	No Acc.	DK	Easy Acc.	Difficult Acc.	No Acc.	DK		
			[A]	[B]			[C]	[D]			
B	0.0	92.2	4.8	0.3	2.7	85.9	7.8	1.5	4.7	4.2	
DK	0.0	<b>100.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>99.5</b>	<b>0.2</b>	<b>0.1</b>	<b>0.2</b>	0.3	
GR	0.0	90.1	<b>7.4</b>	0.7	1.8	91.3	6.6	<b>0.1</b>	1.9	<b>-1.4</b>	

I	0.0	91.2	4.6	0.0	4.1	<b>80.4</b>	<b>12.1</b>	<b>2.6</b>	4.9	<b>10.1</b>
E	0.0	92.5	3.9	0.2	3.4	90.8	5.9	<b>0.1</b>	3.2	1.9
F	0.0	95.6	2.3	0.4	1.7	89.5	6.0	0.5	4.0	3.8
IRL	0.0	96.6	1.1	0.3	2.0	96.4	1.5	0.5	1.7	0.6
L	0.0	96.6	0.7	0.9	1.9	95.7	2.7	<b>0.1</b>	1.5	1.2
NL	0.0	94.2	2.5	0.3	3.0	84.9	6.7	0.2	<b>8.2</b>	4.1
P	0.0	95.2	3.8	0.0	1.0	89.8	8.4	0.2	1.6	4.8
FIN	0.0	93.8	2.6	0.5	3.1	91.7	4.6	0.5	3.3	2.0
S	0.0	96.7	1.4	1.3	0.6	95.5	2.7	0.2	1.6	0.2
A	0.0	87.3	4.7	<b>3.3</b>	4.6	89.7	5.8	1.1	3.4	-1.1
D	0.6	<b>81.0</b>	6.8	1.8	<b>9.8</b>	83.4	8.3	1.5	6.9	1.2
UK	0.0	97.9	0.7	0.3	1.1	93.7	3.3	0.5	2.6	2.8
<i>TOT</i>	<i>0.1</i>	<i>91.2</i>	<i>3.9</i>	<i>0.7</i>	<i>4.1</i>	<i>87.7</i>	<i>6.9</i>	<i>1.0</i>	<i>4.4</i>	<i>3.3</i>

**Table 5. Answers on electricity service prices – Years 2000 and 2002 - Percentages**

	2000						2002					Diff
	N.Av.	Fair	Unfair	Excess.	DK	Not Appl.	Fair	Unfair	Excess.	DK	Not Appl.	
			[A]	[B]				[C]	[D]			(C+D)- (A+B)
B	0.0	42.1	36.7	16.2	3.7	1.3	59.7	25.4	9.0	4.6	1.3	<b>-18.5</b>
DK	0.0	70.2	24.1	3.2	2.4	<b>0.1</b>	64.8	26.6	3.9	4.7	<b>0.1</b>	3.2
GR	0.0	49.9	36.4	11.9	<b>1.3</b>	0.5	37.7	<b>48.8</b>	11.6	<b>1.8</b>	<b>0.1</b>	12.1
I	0.0	43.8	30.7	<b>19.8</b>	5.3	0.4	<b>34.0</b>	39.2	<b>19.7</b>	6.0	1.1	8.4
E	0.0	45.8	38.0	12.2	2.6	1.4	47.8	40.8	5.2	4.5	1.7	-4.2
F	0.0	55.3	25.3	16.3	1.9	1.1	51.8	31.0	10.4	5.3	1.5	-0.2
IRL	0.0	72.4	11.9	6.9	5.1	3.6	58.2	26.3	7.6	7.0	1.0	<b>15.1</b>
L	0.0	<b>78.0</b>	<b>7.6</b>	8.4	4.8	1.2	72.0	<b>8.4</b>	11.0	7.9	0.7	3.4
NL	0.0	68.9	18.0	4.9	6.5	1.7	64.4	20.5	3.7	<b>8.8</b>	<b>2.5</b>	1.3
P	0.0	<b>37.2</b>	<b>48.2</b>	11.2	2.5	0.9	42.5	45.8	5.9	4.6	1.2	-7.7
FIN	0.0	60.8	33.1	<b>1.2</b>	2.6	2.3	58.2	36.5	<b>1.0</b>	3.6	0.7	3.2
S	0.0	60.3	29.7	5.2	2.8	1.9	56.9	34.5	2.8	4.5	1.2	2.4
A	0.0	54.7	26.6	10.3	4.0	4.4	60.7	26.8	6.6	4.4	1.4	-3.5
D	0.3	51.8	30.7	3.0	<b>9.5</b>	<b>4.7</b>	55.8	32.0	2.7	7.2	2.2	1.0
UK	0.0	73.5	16.9	4.4	2.9	2.3	<b>77.9</b>	14.2	1.4	4.3	2.3	-5.7
TOT	0.1	54.6	28.4	10.0	4.7	2.1	54.1	31.4	7.3	5.6	1.7	0.3

**Table 6. Answers on electricity service quality – Years 2000 and 2002 - Percentages**

	2000							2002						Diff.
	N.A.	V. good	F. good	F. bad	V. bad	DK	Not Appl.	V. good	F. good	F. bad	V. bad	DK	Not Appl.	
			[A]	[B]					[C]	[D]				[(C+D)- (A+B)]
B	0.0	40.2	55.2	1.9	0.3	1.5	0.9	46.4	48.2	2.4	0.1	2.0	0.9	0.3
DK	0.0	69.0	30.4	<b>0.4</b>	<b>0.0</b>	<b>0.3</b>	<b>0.0</b>	66.9	30.1	1.3	0.1	1.5	<b>0.1</b>	1.0
GR	0.0	33.2	55.0	<b>7.3</b>	<b>0.9</b>	2.3	1.3	28.1	57.7	<b>11.2</b>	<b>1.9</b>	1.0	<b>0.1</b>	<b>4.9</b>
I	0.0	19.7	70.1	6.7	0.8	2.3	0.4	13.3	70.0	10.4	1.0	4.9	0.5	3.9
E	0.0	20.2	73.1	3.7	<b>0.9</b>	1.3	0.7	25.2	63.5	8.9	0.4	1.4	0.6	4.7
F	0.0	41.2	55.2	2.3	0.1	0.8	0.5	34.0	60.2	2.1	0.1	2.8	0.8	-0.2
IRL	0.0	<b>70.0</b>	<b>25.8</b>	1.3	0.1	1.0	1.8	<b>67.4</b>	<b>30.0</b>	<b>0.4</b>	0.4	1.5	0.4	-0.6
L	0.0	59.0	37.1	0.5	0.2	1.9	1.3	56.0	39.4	1.8	0.6	1.9	0.3	1.7
NL	0.0	56.9	38.8	0.9	0.1	2.0	1.3	38.6	50.2	3.5	0.3	5.0	2.4	2.8
P	0.0	<b>13.1</b>	<b>78.5</b>	7.1	0.3	0.9	0.1	<b>7.8</b>	<b>81.0</b>	8.9	1.0	<b>0.9</b>	0.5	2.5
FIN	0.0	47.8	48.6	<b>0.4</b>	0.1	1.8	1.3	41.3	53.1	2.2	0.3	2.7	<b>5.0</b>	2.0
S	0.0	58.8	36.5	2.4	<b>0.0</b>	1.0	1.3	63.4	30.9	3.0	0.5	2.1	0.2	1.1
A	0.0	64.3	28.1	1.9	0.1	1.7	<b>3.9</b>	59.3	34.4	4.3	<b>0.0</b>	1.4	0.7	2.3
D	1.0	29.5	52.8	5.1	0.8	<b>8.7</b>	2.1	31.0	56.1	4.8	0.3	<b>6.0</b>	1.8	<b>-0.8</b>
UK	0.0	51.8	42.7	2.3	0.6	1.3	1.2	50.8	44.1	1.6	0.5	1.3	1.7	<b>-0.8</b>
TOT	0.2	35.9	55.2	3.9	0.6	3.1	1.1	33.8	56.1	5.2	0.5	3.3	1.1	1.2

**Table 7. Answers on water supply service access – Years 2000 and 2002 - Percentages**

	2000					2002				
	N.A.	Easy Acc.	Difficult Acc.	No Acc.	DK	Easy Acc.	Difficult Acc.	No Acc.	DK	Diff.
			[A]	[B]			[C]	[D]		[C+D]- [A+B]
B	0.0	91.2	5.5	0.4	2.9	86.2	8.0	1.2	4.6	3.3
DK	0.0	<b>99.8</b>	<b>0.1</b>	<b>0.0</b>	<b>0.1</b>	<b>99.5</b>	<b>0.4</b>	<b>0.0</b>	<b>0.2</b>	0.3
GR	0.0	89.5	<b>8.2</b>	0.6	1.7	90.2	6.2	1.4	2.1	-1.2
I	0.0	89.5	5.5	<b>0.0</b>	5.0	<b>79.5</b>	<b>10.3</b>	<b>2.5</b>	7.7	<b>7.3</b>
E	0.0	92.5	3.8	0.3	3.5	92.7	3.8	0.4	3.0	0.1
F	0.0	94.6	2.8	0.4	2.2	86.2	6.3	1.4	6.1	4.5
IRL	0.0	93.4	1.0	2.6	2.9	92.8	1.9	1.0	4.3	-0.7
L	0.0	96.6	0.8	1.2	1.4	94.7	3.1	0.3	1.8	1.4
NL	0.0	94.4	3.1	<b>0.0</b>	2.5	85.0	5.4	0.4	9.2	2.7
P	0.0	89.8	5.8	2.2	2.2	86.3	9.8	2.3	1.6	4.1
FIN	0.0	87.5	3.2	<b>4.1</b>	5.2	88.1	3.5	3.0	5.5	-0.8
S	0.0	93.6	0.7	4.0	1.7	95.7	1.5	1.4	1.4	<b>-1.8</b>
A	0.0	85.5	4.3	3.9	6.4	86.7	6.0	1.9	5.4	-0.3
D	0.3	<b>79.0</b>	6.7	2.4	<b>11.7</b>	<b>79.5</b>	8.9	2.1	<b>9.6</b>	1.9
UK	0.0	97.5	1.0	0.4	1.1	92.9	3.0	0.9	3.2	2.5
TOT	0.1	89.9	4.2	1.0	4.8	86.0	6.5	1.5	6.0	2.8

**Table 8. Answers on water supply service prices – Years 2000 and 2002 - Percentages**

	2000						2002					Diff
	N.Av.	Fair	Unfair	Excess.	DK	Not Appl.	Fair	Unfair	Excess.	DK	Not Appl.	
			[A]	[B]				[C]	[D]			(C+D)- (A+B)
B	0.0	48.4	31.9	14.3	4.0	1.4	59.1	24.1	9.2	5.7	1.9	<b>-12.9</b>
DK	0.0	66.9	24.5	4.7	3.6	<b>0.3</b>	65.7	22.6	4.8	6.7	<b>0.2</b>	-1.8
GR	0.0	76.3	17.2	4.5	<b>1.3</b>	0.8	59.6	34.1	3.2	<b>1.9</b>	1.2	<b>15.6</b>
I	0.0	<b>44.6</b>	30.1	17.6	7.0	0.7	<b>43.1</b>	31.1	<b>17.2</b>	7.0	1.6	0.6
E	0.0	56.3	28.8	9.8	2.9	2.1	58.8	31.2	2.9	5.0	2.1	-4.5
F	0.0	46.6	26.4	<b>22.9</b>	2.9	1.1	43.4	31.1	<b>17.2</b>	6.3	2.0	-1.0
IRL	0.0	65.3	8.8	2.0	7.4	<b>16.4</b>	63.5	5.8	1.4	<b>13.8</b>	<b>15.6</b>	-3.6
L	0.0	<b>81.3</b>	<b>5.3</b>	6.3	5.8	1.4	<b>77.4</b>	<b>5.7</b>	8.2	7.7	1.0	2.3
NL	0.0	72.1	14.5	5.7	6.1	1.7	71.5	13.7	1.7	10.1	3.0	-4.8
P	0.0	47.7	<b>36.3</b>	6.7	2.9	6.3	49.7	<b>35.3</b>	3.6	4.2	7.2	-4.1
FIN	0.0	64.9	21.9	<b>0.4</b>	5.2	7.5	64.4	21.6	1.2	7.7	5.1	0.5
S	0.0	59.0	14.6	2.3	9.9	14.2	72.7	7.3	<b>0.9</b>	9.5	9.7	-8.7
A	0.0	63.9	15.8	7.6	5.8	6.8	63.9	19.5	5.5	7.2	3.9	1.6
D	0.2	45.1	34.5	5.3	<b>9.8</b>	5.1	49.8	33.1	5.1	8.8	3.2	-1.6
UK	0.0	62.8	24.0	6.5	3.6	3.2	67.6	21.0	3.1	5.0	3.3	-6.4
TOT	0.0	52.9	27.5	10.7	5.6	3.2	54.4	27.8	7.9	6.9	3.0	-2.5

**Table 9. Answers on water supply service quality – Years 2000 and 2002 - Percentages**

	2000							2002						Diff.
	N.A.	V. good	F. good	F. bad	V. bad	DK	Not Appl.	V. good	F. good	F. bad	V. bad	DK	Not Appl.	
				[A]	[B]					[C]	[D]			[(C+D)-(A+B)]
B	0.0	38.7	54.4	3.2	0.4	2.3	1.0	45.7	47.8	2.7	0.5	2.2	1.2	-0.4
DK	0.0	<b>68.8</b>	30.0	<b>0.6</b>	<b>0.0</b>	<b>0.5</b>	<b>0.0</b>	66.3	29.2	2.6	<b>0.2</b>	1.5	<b>0.2</b>	2.2
GR	0.0	35.2	52.3	8.4	1.3	2.3	0.5	29.2	57.2	8.5	<b>2.5</b>	1.3	1.4	1.3
I	0.0	18.2	64.8	<b>10.1</b>	3.0	3.1	0.7	13.9	67.2	<b>10.6</b>	2.4	5.1	0.8	-0.1
E	0.0	19.7	<b>72.2</b>	4.8	1.0	1.3	0.9	25.8	64.9	6.3	0.8	1.5	0.6	1.3
F	0.0	34.2	56.9	5.8	1.1	1.3	0.8	28.7	58.1	6.2	1.0	5.0	1.1	0.3
IRL	0.0	58.8	28.5	3.5	1.5	2.3	5.4	57.3	33.5	2.9	1.1	2.5	2.8	-1.0
L	0.0	57.5	37.0	1.0	0.5	2.0	2.0	52.6	39.7	2.8	1.3	3.1	0.5	2.6
NL	0.0	57.8	37.6	0.8	0.1	2.2	1.6	41.3	48.5	1.7	<b>0.2</b>	5.7	2.5	1.0
P	0.0	<b>12.9</b>	71.7	7.4	0.5	1.3	6.2	<b>6.8</b>	<b>73.9</b>	10.3	1.6	<b>1.1</b>	<b>6.3</b>	<b>4.0</b>
FIN	0.0	41.3	46.1	1.2	0.8	3.2	7.4	45.1	42.9	1.8	0.4	4.9	4.9	0.2
S	0.0	57.8	31.4	1.2	0.3	2.7	<b>6.5</b>	<b>72.1</b>	<b>19.1</b>	<b>1.3</b>	0.8	3.1	3.5	0.6
A	0.0	64.6	<b>24.0</b>	2.2	0.5	2.5	6.3	58.9	32.6	2.7	0.4	3.4	2.0	0.4
D	0.6	29.5	50.8	6.3	1.2	<b>9.3</b>	2.3	28.8	55.8	5.6	0.4	<b>7.3</b>	2.1	<b>-1.5</b>
UK	0.0	49.2	43.6	2.9	1.0	1.5	1.7	47.6	44.5	3.1	0.9	1.8	2.2	0.1
TOT	0.1	34.0	53.6	5.5	1.3	3.6	1.8	32.5	54.7	5.8	1.0	4.2	1.8	0.0

**Table 10. Answers on gas supply service access – Years 2000 and 2002 - Percentages**

	2000					2002					Diff.
	N.A.	Easy Acc.	Difficult Acc.	No Acc.	DK	Easy Acc.	Difficult Acc.	No Acc.	DK		
			[A]	[B]			[C]	[D]		[(C+D)-(A+B)]	
B	0.0	83.4	7.0	4.5	5.2	68.7	7.9	14.1	9.3	10.5	
DK	0.0	47.3	5.2	33.8	13.7	38.3	4.8	46.6	10.3	12.4	
GR	0.0	<b>2.1</b>	<b>0.6</b>	<b>84.4</b>	12.9	<b>4.5</b>	3.3	58.4	33.8	<b>-23.3</b>	
I	0.0	85.7	5.8	4.7	3.8	74.9	<b>11.1</b>	6.3	7.8	6.9	
E	0.0	86.7	6.9	1.4	5.1	<b>86.4</b>	6.2	<b>0.7</b>	6.7	-1.4	
F	0.0	80.3	3.7	9.1	6.9	69.2	6.9	11.8	12.1	5.9	
IRL	0.0	51.4	4.8	32.0	11.8	43.6	3.3	30.2	22.9	-3.3	
L	0.0	68.9	3.2	22.2	5.7	59.1	3.1	31.7	6.2	9.4	
NL	0.0	<b>93.6</b>	2.5	<b>0.5</b>	3.4	81.7	6.8	1.0	10.6	4.8	
P	0.0	75.3	8.9	8.5	7.3	78.4	11.0	5.1	5.6	-1.3	
FIN	0.0	20.9	13.4	35.2	<b>30.5</b>	8.4	8.6	56.7	<b>26.4</b>	<b>16.7</b>	
S	0.0	5.9	<b>1.8</b>	82.3	10.0	6.0	<b>1.2</b>	<b>76.6</b>	16.1	-6.3	
A	0.0	62.8	7.5	10.3	19.4	51.3	8.6	23.6	16.5	14.4	
D	0.5	63.8	7.4	10.9	17.5	57.3	8.0	16.6	18.1	6.3	
UK	0.0	91.4	2.0	4.1	<b>2.6</b>	85.6	3.5	6.8	<b>4.1</b>	4.2	
TOT	0.1	74.4	5.2	11.5	8.7	66.6	7.1	14.3	12.0	4.7	



**Table 11. Valid answers on gas supply service access – Years 2000 and 2002 - Percentages**

	2000			2002			Diff [(C+D)-(A+B)]
	Easy Access	Difficult Access [A]	No Access [B]	Easy Access	Difficult Access [C]	No Access [D]	
B	87.9	7.3	4.7	75.7	8.7	15.5	12.2
DK	54.8	6.0	39.2	42.7	5.3	52.0	12.1
GR	<b>2.5</b>	<b>0.7</b>	<b>96.8</b>	<b>6.8</b>	5.0	88.1	<b>-4.4</b>
I	89.0	6.0	4.9	81.2	<b>12.0</b>	6.8	7.9
E	91.3	7.3	1.4	<b>92.6</b>	6.7	<b>0.8</b>	-1.2
F	86.2	4.0	9.8	78.7	7.9	13.4	7.5
IRL	58.3	5.5	36.3	56.6	4.3	39.1	1.6
L	73.1	3.4	23.6	63.0	3.3	33.8	10.1
NL	<b>96.9</b>	2.6	<b>0.5</b>	91.4	7.6	1.1	5.6
P	81.2	9.6	9.2	83.0	11.6	5.4	-1.8
FIN	30.1	19.3	50.6	11.4	11.7	77.0	<b>18.8</b>
S	6.6	<b>2.0</b>	91.4	7.2	<b>1.5</b>	<b>91.3</b>	-0.6
A	77.9	9.3	12.8	61.4	10.3	28.3	16.5
D	77.7	9.0	13.2	70.0	9.8	20.2	7.8
UK	93.8	2.0	4.2	89.3	3.7	7.0	4.5
TOT	81.6	5.7	12.6	75.7	8.1	16.2	6.0

**Table 12. Answers on gas supply service prices – Years 2000 and 2002 - Percentages**

	2000						2002					Diff [(C+D)-(A+B)]
	N.Av.	Fair	Unfair [A]	Excess. [B]	DK	Not Appl.	Fair	Unfair [C]	Excess. [D]	DK	Not Appl.	
B	0.0	39.1	29.6	11.1	7.5	12.6	49.5	16.4	5.3	8.5	20.3	<b>-19.0</b>
DK	0.0	27.8	8.1	1.5	6.7	55.9	24.6	6.3	0.8	5.2	63.0	-2.5
GR	0.0	<b>1.6</b>	<b>0.2</b>	<b>0.0</b>	12.2	86.0	<b>0.6</b>	<b>0.5</b>	<b>0.3</b>	<b>31.5</b>	67.2	0.6
I	0.0	37.5	30.7	<b>20.1</b>	6.2	5.5	34.5	33.9	<b>17.6</b>	8.2	5.8	0.7
E	0.0	48.6	31.9	8.3	3.7	7.5	49.2	32.5	3.3	7.0	8.0	-4.4
F	0.0	53.4	15.2	7.6	6.9	16.9	41.9	22.0	5.5	10.4	20.2	<b>4.7</b>
IRL	0.0	35.7	4.9	1.7	8.7	49.1	29.5	6.8	1.4	11.6	50.7	1.6
L	0.0	55.3	4.1	4.8	10.7	25.1	44.2	4.5	5.4	8.4	37.4	1.0
NL	0.0	66.1	19.6	5.1	6.0	<b>3.2</b>	63.3	18.2	3.5	10.0	<b>5.0</b>	-3.0
P	0.0	31.1	<b>38.7</b>	6.9	4.7	18.6	44.5	<b>34.5</b>	3.7	5.2	12.1	-7.4
FIN	0.0	11.8	6.2	1.1	<b>21.1</b>	59.8	5.7	2.6	0.3	17.3	74.1	-4.4
S	0.0	4.0	1.3	0.4	7.0	<b>87.3</b>	4.8	1.0	0.3	8.7	<b>85.2</b>	-0.4
A	0.0	35.3	13.2	5.1	10.7	35.6	28.7	15.4	4.1	13.7	38.1	1.2
D	0.4	36.7	24.2	2.3	12.8	23.4	36.5	20.8	2.6	16.6	23.6	-3.1
UK	0.0	<b>69.1</b>	15.1	3.3	<b>3.6</b>	8.9	<b>72.4</b>	11.8	1.1	<b>4.5</b>	10.2	-5.5
TOT	0.1	44.5	21.5	7.1	7.6	19.1	42.5	21.0	5.2	10.7	20.6	-2.4

**Table 13. Valid answers on gas supply service prices – Years 2000 and 2002 - Percentages**

	2000			2002			Diff [(C+D)- (A+B)]
	Fair	Unfair [A]	Excessive [B]	Fair	Unfair [C]	Excessive [D]	
B	49.0	37.1	13.9	69.6	23.0	7.4	<b>-20.6</b>
DK	74.4	21.7	3.9	77.4	20.0	2.7	-2.9
GR	<b>89.2</b>	9.7	<b>1.1</b>	43.4	34.4	<b>22.1</b>	<b>45.7</b>
I	42.5	34.7	<b>22.8</b>	<b>40.1</b>	39.5	20.4	2.4
E	54.7	36.0	9.4	57.9	38.2	3.9	-3.3
F	70.1	19.9	9.9	60.4	31.7	7.9	9.8
IRL	84.5	11.5	4.1	78.4	18.0	3.6	6.0
L	86.3	<b>6.3</b>	7.4	81.7	<b>8.3</b>	10.0	4.6
NL	72.7	21.6	5.7	74.5	21.5	4.1	-1.7
P	<b>40.5</b>	<b>50.5</b>	9.0	53.8	<b>41.7</b>	4.5	-13.3
FIN	61.9	32.5	5.6	67.1	29.9	3.0	-5.2
S	70.7	22.8	6.5	78.8	16.5	4.7	-8.1
A	65.8	24.7	9.5	59.5	31.9	8.6	6.3
D	58.0	38.3	3.7	61.0	34.7	4.3	-3.0
UK	78.9	17.3	3.8	<b>84.9</b>	13.8	<b>1.3</b>	-6.0
TOT	60.8	29.4	9.7	61.9	30.6	7.5	-1.0

**Table 14. Answers on gas supply service quality – Years 2000 and 2002 - Percentages**

	2000							2002							Diff. [(C+D)- (A+B)]
	N.A.	V. good	F. good	F. bad	V. bad	DK	Not Appl.	V. good	F. good	F. bad	V. bad	DK	Not Appl.		
			[A]	[B]						[C]	[D]				
B	0.0	33.9	45.2	2.1	0.6	4.5	13.7	35.9	35.7	1.8	0.1	7.7	18.8	-0.8	
DK	0.0	25.7	11.8	0.2	0.1	5.6	56.7	20.9	11.0	0.4	<b>0.0</b>	4.0	63.7	0.1	
GR	0.0	<b>1.6</b>	<b>1.1</b>	<b>0.0</b>	0.3	12.2	84.9	<b>0.2</b>	<b>1.4</b>	<b>0.3</b>	0.6	<b>30.4</b>	67.1	0.6	
I	0.0	19.3	64.5	5.8	1.0	3.8	5.5	14.3	64.6	<b>8.0</b>	1.1	6.9	<b>5.1</b>	<b>2.3</b>	
E	0.0	16.6	<b>68.1</b>	4.5	<b>1.7</b>	<b>1.7</b>	7.5	21.7	61.0	4.9	0.9	4.5	7.0	-0.4	
F	0.0	32.5	44.4	1.8	<b>0.0</b>	5.1	16.2	26.6	43.1	2.4	0.1	7.9	19.9	0.7	
IRL	0.0	32.5	12.2	1.0	0.2	6.7	47.3	26.4	13.4	1.0	1.1	8.3	49.9	0.9	
L	0.0	35.4	32.1	0.5	0.7	6.6	24.6	32.8	24.0	<b>0.3</b>	0.3	4.8	37.8	-0.6	
NL	0.0	<b>56.3</b>	37.0	0.6	0.1	2.5	<b>3.6</b>	39.3	48.0	2.0	0.2	5.3	<b>5.1</b>	1.5	
P	0.0	10.4	59.8	<b>7.9</b>	0.3	2.9	18.6	6.6	<b>69.7</b>	7.2	<b>1.4</b>	2.3	12.8	0.4	
FIN	0.0	5.3	13.6	0.6	0.4	<b>18.6</b>	61.5	2.1	5.1	0.5	0.6	14.8	76.9	0.1	
S	0.0	3.2	2.1	0.3	<b>0.0</b>	7.6	<b>86.9</b>	3.2	2.2	<b>0.3</b>	0.2	8.5	<b>85.6</b>	0.2	
A	0.0	32.9	21.0	1.5	1.5	8.2	34.9	26.6	19.8	4.3	0.2	9.8	39.2	1.5	
D	0.6	20.7	38.6	5.1	0.7	16.4	17.9	18.2	37.2	4.7	0.4	15.7	23.9	-0.7	
UK	0.0	47.8	38.5	2.5	0.9	2.3	8.0	<b>45.8</b>	40.5	1.3	0.7	<b>1.9</b>	9.8	<b>-1.4</b>	
TOT	0.1	26.8	44.1	3.6	0.7	7.0	17.7	23.5	42.9	3.8	0.6	8.8	20.4	0.1	

#### 4 Some preliminary empirical findings

In this section we construct some dichotomous indices of satisfaction. The “access satisfaction” index is equal to 1 if an individual answered that the access is easy for all considered services (fixed telephone, water, gas and electricity), the “price satisfaction” index is equal to 1 if an individual answered that the price of all considered services are fair, and the “quality satisfaction” index is equal to 1 if an individual answered that quality of all considered services is either very good or fairly good. In all other cases these indices are equal to 0. Finally, the “overall satisfaction” index is equal to 1 if an individual declares to be satisfied for all services and all issues. Table 15 shows a frequency distribution of these indices. It shows that 89% of the sample are satisfied of SGI quality, 65% of their availability and only 42% about their prices. About 27% of interviewed consumers are satisfied about all services across access, price and quality dimension.

Table 15: frequencies of satisfaction indices

	Satisfaction indices			
	Access	Price	Quality	Overall
not satisfied	35%	58%	11%	73%
satisfied	65%	42%	89%	27%
total	100%	100%	100%	100%

Hence, we estimate a model where:

$$S = \alpha + \beta' X + \gamma' Z + \delta Y + \varepsilon$$

where  $S$  is an index of satisfaction,  $\alpha$  is a constant,  $X$  is a matrix of variables that includes demographic variables (sex, age, age squared, marital status, occupation), economic characteristics (whether main income in the household, household income in quartiles), level of cooperation with interviewer, and political views of the interviewees.  $Z$  is a matrix of country-level data including country fixed effects,  $Y$  is a year fixed effects equal to 1 for year 2002 and to 0 for year 2000, and  $\varepsilon$  accounts for individual idiosyncrasies. We assume that  $\varepsilon$  is logistically distributed and we estimate the model using maximum likelihood. The aims of this regression analysis are to evaluate whether different socio-economic groups have different level of satisfaction with respect to access, price and quality of SGIs, to assess whether there are significant difference in consumer satisfaction across countries, and whether there is any trend in consumer satisfaction.

In addition to country fixed effects, we try to control for other variables such as, country macroeconomic variables (subsidies to producers, public procurement as % of GDP, per capita GDP) and regulation variables taken from the REGREF OECD database (Conway and Nicoletti, 2006). However, these variables are highly collinear with country fixed effects, hence we also estimate a model with only the former in the matrix  $Z$  of the model.

Main results are presented in terms of odd ratios, i.e.  $\Pr(S = 1 | X, Z, Y) / \Pr(S = 0 | X, Z, Y)$ . For instance, if the coefficient for “sex=female” is larger than 1, it means that females are more likely to be satisfied than males. Table 16 and 17 are presented results that can be summarized as follows.

Socio-economic variables:

1. females are about 15% less likely to be satisfied about SGI than men. However, females complain more about price, males about access.
2. the older, the more dissatisfied consumers are, especially about price. People with one year more than the average population age are 5% more likely to be less satisfied about price.
3. single or separated/divorced/widowed people are significantly less dissatisfied than married people. Single in particular are about 24% more likely to evaluate prices as fair.
4. Unemployed and self-employed tend to be the most dissatisfied with all SGIs, students the least.
5. People who are the least contributors to household income are significantly less dissatisfied than main income earners, especially with respect to price and quality.
6. The higher is household income, the lower the dissatisfaction with most SGIs. In particular, people whose household income is in top quartile are about 25% more likely to be satisfied with SGI than people in bottom quartile.
7. Left-wingers are significantly less satisfied with SGI than other.
8. very co-operative respondents tend to show more dissatisfaction than non co-operative ones.

Country fixed-effects:

1. Greece, Italy, Portugal, Finland, Sweden (and to a smaller degree Spain and France) are consistently more dissatisfied, Great Britain, the Netherlands, Germany, Austria and Ireland are more satisfied than Belgium, the reference country. Greeks are the least happy about access, Italians about prices and about quality.

Country-level economic:

1. The richer the country (in terms of per capita income), the larger are public procurement and subsidies to producers (as % GDP), the more satisfied people are.
2. Larger per capita social benefits and government expenditures and revenues have a negative effect on consumer satisfaction.

Country-level reform variables:

1. Entry regulation: where TPA is more difficult (variable “entry regulation” is larger), consumer are more likely to be unsatisfied for telephone services. The effect tend to be reversed (though very small and not significant) for electricity and gas.
2. Market structure: where the market structure is more concentrated (variable market structure increases), consumer satisfaction is smaller for both telephone and gas, and in particular for prices.
3. Vertical integration (ownership separation=minimum, integrated=maximum): where the industry is more integrated, consumers are more likely to be satisfied, especially for gas.
4. Public ownership (public ownership=6, no public ownership=0): ceteris paribus, consumers are more likely to be satisfied if telephone and gas services are publicly owned, the reverse applies with electricity.

Year fixed-effects:

1. There sign of improvement in terms of consumer satisfaction between 2000 and 2002, although this results is mainly driven by better assessment of access and quality.

Table 16: logit estimation of overall consumer satisfaction indices.

	Overall satisfactin	Overall satisfactin
<b><i>Individual socio-economic characteristics</i></b>		
female	0.865***	0.873***
Age	0.968***	0.967***
age squared	1.000***	1.000***
Single	1.181***	1.165***
separated/divorced/widowed	1.076*	1.083*
age when finished education	0.997	1.015
(age when finished education) squared	1.000	0.999
manager	1.188***	1.203***
other white collar	1.115*	1.134**
manual worker	1.076	1.122**
house person	1.257***	1.284***
unemployed	0.807***	0.840**
retired	1.104	1.145**
student	1.339	1.616**
contribution to hh income: least	1.124***	1.102***
contribution to hh income: equal	0.985	0.973
II quartile	1.163***	1.167***
III quartile	1.215***	1.235***
IV quartile	1.291***	1.318***
political views: center	1.123***	1.120***
political views: right	1.162***	1.137***
respondent cooperation: fair	1.111***	1.097***
respondent cooperation: average	1.042	1.042
respondent cooperation: bad	1.167	1.095
<b><i>country fixed effects</i></b>		
Denmark	0.875	
Germany	1.319***	
Greece	0.139***	
Italy	0.389***	
Spain	0.843*	
France	0.865*	
Ireland	1.320*	
Luxembourg	1.649	
Netherlands	2.245***	
Portugal	0.548***	
Great Britain	2.506***	
Finland	0.551***	
Sweden	0.247***	
Austria	1.301**	
<b><i>country macroeconomic variables</i></b>		
GDP, per capita		1.007*
public procurement values, % GDP		1.283***
social benefit, % GDP		0.973
subsidies to producers, % GDP		1.129**
total government expenditure, % GDP		0.936***
total government revenues, % GDP		0.965*
<b><i>regulation variables</i></b>		
Entry Regulation: Tel		0.622***
Entry Regulation: Ele		1.017
Entry Regulation: Gas		1.010
Market Structure: Tel		0.848***
Market Structure: Gas		0.731***
Vertical Intergration: Ele		1.022
Vertical Intergration: Gas		1.259***
Public Ownership: Tel		1.443***
Public Ownership: Ele		0.670***
Public Ownership: Gas		1.318***

year 2002	0.895***	0.966
Observations	31507	31471

p values in parentheses

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

Table 17: logit estimation of access, price and quality consumer satisfaction indices.

	Access satisfaction	Access satisfaction	Price satisfaction	Price satisfaction	Qualità satisfaction	Quality satisfaction
<b>Individual socio-economic characteristics</b>						
female	1.155***	1.157***	0.863***	0.868***	1.056	1.063
age	1.022***	1.021***	0.952***	0.952***	0.993	0.994
age squared	1.000***	1.000***	1.001***	1.001***	1.000**	1.000**
single	0.973	0.963	1.241***	1.231***	1.087*	1.086*
separated/divorced/widowed	0.944	0.956	1.054	1.054	1.089	1.089
age when finished education	1.041**	1.069***	1.013	1.017	1.024	1.025
(age when finished education) squared	0.999*	0.998***	1.000	1.000	0.999	0.999
manager	1.002	1.005	1.149**	1.169***	1.273***	1.282***
other white collar	0.967	0.969	1.063	1.082	1.191**	1.204***
manual worker	0.990	1.022	1.057	1.085	1.222***	1.250***
house person	1.031	1.049	1.196***	1.214***	1.266***	1.276***
unemployed	0.883	0.908	0.864**	0.881*	0.978	0.996
retired	1.046	1.070	1.070	1.096	1.210**	1.228**
student	1.898***	2.445***	1.560**	1.625***	1.522*	1.583*
contribution to hh income: least	0.949	0.940	1.085**	1.069*	1.147***	1.134***
contribution to hh income: equal	0.997	0.986	0.950	0.948	1.137	1.148
II quartile	1.332***	1.330***	1.086*	1.086*	1.118*	1.121**
III quartile	1.459***	1.469***	1.082**	1.084**	1.128**	1.135**
IV quartile	1.411***	1.452***	1.191***	1.194***	1.385***	1.408***
political views: center	1.025	1.016	1.124***	1.125***	1.230***	1.233***
political views: right	1.001	0.980	1.106***	1.091***	1.181***	1.177***
respondent cooperation: fair	1.134***	1.124***	1.114***	1.101***	0.995	1.001
respondent cooperation: average	1.244***	1.216***	1.009	1.016	1.070	1.081
respondent cooperation: bad	0.865	0.801**	1.393***	1.357***	1.001	0.982
<b>country fixed effects</b>						
Denmark	0.390***		1.672***		1.529	
Germany	0.891		1.531***		0.456***	
Greece	0.088***		0.790**		0.268***	
Italy	1.073		0.407***		0.230***	
Spain	2.641***		0.740***		0.316***	
France	1.234**		0.854**		0.581***	
Ireland	0.519***		2.467***		0.884	
Luxembourg	0.689		2.756***		0.922	
Netherlands	3.490***		1.895***		1.177	
Portugal	0.760**		0.684***		0.306***	
Great Britain	2.301***		2.585***		0.812	
Finland	0.207***		1.432***		1.305	
Sweden	0.074***		1.791***		1.300	
Austria	0.760**		1.556***		0.758	
<b>country macroeconomic variables</b>						
GDP, per capita		1.014***		1.013***		1.015***
public procurement values, % GDP		1.286***		1.316***		1.057
social benefit, % GDP		1.207***		0.876***		0.818***
subsidies to producers, % GDP		1.249***		1.068		1.059
total government expenditure, % GDP		1.012		0.916***		1.022
total government revenues, % GDP		0.894***		1.028		0.954*
<b>regulation variables</b>						
Entry Regulation: Tel		0.700***		1.051		0.877*
Entry Regulation: Ele		0.791***		1.068**		0.923*
Entry Regulation: Gas		1.006		1.112***		1.131***
Market Structure: Tel		1.100**		0.946*		1.157***

Market Structure: Gas		0.727***		0.698***		0.878
Vertical Intergration: Ele		0.917**		0.940**		0.967
Vertical Intergration: Gas		1.580***		1.107*		1.068
Public Ownership: Tel		0.821***		1.770***		2.090***
Public Ownership: Ele		0.468***		0.794***		0.784***
Public Ownership: Gas		1.814***		1.125***		1.026
year 2002	0.695***	0.435***	0.959*	1.247***	0.768***	0.933
Observations	31507	31471	31507	31471	31507	31471

p values in parentheses

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

Finally, in line with the natural experiment approach outlined in Section 1, we would like to assess whether undertaken policy reforms towards an opening of SGI markets to competition, as suggested by the EC, had any effect on consumer satisfaction. As Table 18 shows, in the 2000-2002 many countries undertake reforms as for entry in the SGI markets, public ownership, market structure and vertical integration. Only public ownership in gas and electricity markets did not see any change. Except for a couple of cases (entry in telephone market in Luxembourg and public ownership in telephone market in Portugal), all reforms have been towards a wider opening of SGI markets and of divestiture of public ownership.

In order to assess the effect of these policies reforms on consumers' subjective satisfaction, we estimate the following model:

$$S = \alpha + \beta' X + \gamma R + \delta Y + \varphi R \cdot Y + \varepsilon$$

where  $S, \alpha, Y, X$  are defined as above,  $R$  is a policy reform that is equal to 1 if there was a *negative* change in a policy variable of Table 18, and 0 otherwise. Hence, the year dummy,  $Y$ , captures aggregate factors that affect  $S$  over time in the same way for treated and control groups. The policy change variable  $R$  captures possible differences between the treatment and control groups before the policy change occurs. The coefficient of interest is  $\varphi$ , which multiplies the interaction term,  $R \cdot Y$ , which is simply a dummy variable equal to unity for those observations in the treatment group in year 2002.

The logit estimator,  $\hat{\varphi}$ , has a very interesting interpretation. Let  $S_{T,2000}, S_{T,2002}$  denote the probability of  $S=1$  given  $X, R, Y$ , for the treated group in year 2000 and 2002, respectively. Define  $S_{C,2000}, S_{C,2002}$  for the control group analogously. Then  $\hat{\varphi}$  can be expressed as

$$\hat{\varphi} = (S_{T,2002} - S_{T,2000}) - (S_{C,2002} - S_{C,2000})$$

and can be interpreted as the additional probability of satisfaction induced by a given policy reform. In table 19 we show the estimation of this simple difference-in-difference estimator for two policy evaluation reforms, namely the change in public ownership of telephone and the change in market structure of the gas industry between 2000 and 2002. Results show that divestiture of public ownership had the effect of reducing satisfaction by over 20% if no socio-economic controls are introduced and by about 9% if socio-economic controls are introduced. The reduction of concentration in gas market caused probability of satisfaction to drop by about 15%.

Table 18: change of regulation variables from 2000 to 2002.

Change of regulation variables from 2000 to 2002,  $\Delta x = x(2000) - x(2002)$

Country	$\Delta$ Telephone market	$\Delta$ entry in electricity market	$\Delta$ entry in gas market	$\Delta$ public ownership in telephone market	$\Delta$ public ownership in electricity market	$\Delta$ public ownership in gas market	market structure in telephone gas	$\Delta$ market structure in gas	$\Delta$ vertical integration in electricity market	$\Delta$ vertical integration in gas market
belgium	0	0	-1.3	0	0	0	-0.7	0	-4.5	-0.9
denmark	0	-0.3	-1.1	0	0	0	-0.2	0	-6	-2.1
germany	0	0	0	-0.4	0	0	0	0	-1.5	0
greece	-3.5	-3.7	0	-1.1	0	0	-0.4	0	-3	-2.1
italy	0	-2	-5.9	0	0	0	-0.8	-1	-4.5	-1.5
spain	0	-0.3	-2.3	0	0	0	-0.3	0	-1.5	0
france	0	-2	0	-0.3	0	0	-1.1	0	0	0
ireland	0	-1.3	-1.1	-0.1	0	0	-0.3	-2	-3	0
luxembourg	0.1		-2.8	0		0		0		-0.9
netherlands	0	0	-0.3	-0.5	0	0	-0.9	0	0	0
portugal	0	-1	0	0.4	0	0	0.3	0	0	0
great britain	0	0	0	0	0	0	-0.4	0	0	0
finland	0	0	0	0	0	0	-0.2	0	0	0
sweden	0	0	0	0	0	0	-0.5	0	-1.5	0
austria	0	-4	-2	-1.6	0	0	-0.2	0	-1.5	-1.5

Note: Entry: Free=0, only one firm=6; public ownership: 0%=0, 100%=6; market structure: market share of largest company < 50%=0, market share of largest company=100%=6; vertical integration: separate companies=0, integrated companies=6.

Source: Conway and Nicoletti (2006).

Table 19: odds ratios of difference-in-difference model.

	DiD: Ownership telephone	Public DiD: of Ownership telephone	Public DiD: of structure in gas industry	Market DiD: Market structure in gas industry
year 2002	1.039	1.147***	0.927***	0.864***
R=1	1.268***	2.065***	0.418***	0.267***
<b>year 2002 &amp; R=1</b>	<b>0.769***</b>	<b>0.911*</b>	<b>0.844**</b>	<b>0.837**</b>
Female		0.892***		0.872***
Age		0.962***		0.967***
age squared		1.000***		1.000***
Single		1.103**		1.169***
Separated/divorced/widowed		1.106**		1.083*
age when finished education		1.039**		1.012
(age when finished education) squared		0.999**		1.000
Manager		1.343***		1.226***
other white collar		1.203***		1.133*
manual worker		1.258***		1.091
house person		1.408***		1.268***
unemployed		0.930		0.820**
Retired		1.250***		1.145**
Student		2.076***		1.524**
contribution to hh income: least		1.028		1.105***
contribution to hh income: equal		0.929		1.003
II quartile		1.201***		1.173***
III quartile		1.240***		1.231***
IV quartile		1.386***		1.306***
political views: center		1.168***		1.127***
political views: right		1.107***		1.160***
respondent cooperation: fair		1.050*		1.115***
respondent cooperation: average		1.041		1.067
respondent cooperation: bad		1.036		1.180
GDP, per capita		1.027***		1.043***
public procurement values, % GDP		1.109***		0.854***



social benefit, % GDP		0.983**		0.972***
subsidies to producers, % GDP		1.030		0.861***
total government expenditure, % GDP		0.890***		1.005
total government revenues, % GDP		1.027**		0.925***
Observations	31967	31507	31967	31507

p values in parentheses

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

## 5 Concluding remarks

To be written later

## 6 References

Angrist J, Krueger A, (2001) Instrumental variables and the search for identification: from demand and supply to natural experiments, *Journal of economic perspectives*, 15 (4) Fall: 69-85

Banks J, Blundell R, Lewbel A, (1996) Tax Reform and Welfare Measurement: Do we need Demand System Estimation?, *Economic Journal*, 106, pp 1227-1241

Boardman AE, Greenberg DH, Vining AR, Weimer DL, (2005) *Cost-Benefit Analysis. Concepts and practice*, Third Edition, Pearson Prentice Hall, Upper Saddle River, New Jersey

Bortolotti P, Pinotti P, The political economy of privatization, *FEEM Note di lavoro*, 45:2003

Brau R, Florio M (2004), Privatisation as price reforms: Evaluating Consumers' Welfare Changes in the UK, in *Annales d'économie et de statistique*, n. 75-76, pp 109-133

Carrera J., Checchi D., Florio M., (2004), Privatization discontent and its determinants: evidence from Latin America, *Working Paper No. 23* Department of Economics, Business and Statistics, University of Milan.

Eurobarometer report No. 53, "The people of Europe and Services of general interest" (October 2000)

Eurobarometer report No. 58 "Consumers' Opinions about Services of General Interest" (December 2002)

Frey BS, Stutzer A, (2002) What economists can learn from happiness research, *Journal of Economic Literature*, 40, 401-35

Florio M (2004), *The Great Divestiture. Evaluating the Welfare Impact of British Privatizations 1979-1997*, MIT Press, Cambridge (Mass)

Layard R, (2005) *Happiness: Lessons from a new science*, New York: Penguin Press

Graham C, *The economics of happiness*, forthcoming in *The New Palgrave Dictionary of Economics*, Second Edition, Durlauf S, Blume L. eds

Martin R, Roma M, Vansteenkiste I, (2005) Regulatory reforms in selected EU network industries, *ECB Occasional Paper n 28*, April 2005

Manzi G. (2006), The opinion about general interest services performance and its relationship with the privatisation process among EU15 citizens: an analysis from Eurobarometer surveys, *Working Paper No. xxx* Department of Economics, Business and Statistics, University of Milan.

Newbery DMG, (2000) *Privatizations, restructuring and regulation of network utilities*, MIT Press, Cambridge (Mass)

Nicoletti G and Scarpetta S, Regulation, Productivity, and Growth: Evidence from the OECD, *Economic Policy*, 36, pp 9-72

Rosenzweig M., Wolpin K.I, (2000) Natural 'Natural experiments' in economics, in *Journal of Economic Literature*, 38 (4): 827-874

Shadish WR, Cook TD, Campbell DT, (2002) *Experimental and quasi-experimental designs for generalized causal inference*, Boston:Houghton Mifflin