

**What Do Citizens Know about statistics?
The results of an OECD/ ISAE survey on Italian Consumers**

F. Fullone (*) M.Gamba (**) E. Giovannini (**) M. Malgarini (*)

May 2007

(*) **ISTITUTO DI STUDI E ANALISI ECONOMICA**

Piazza dell' Indipendenza, 4 00185 – ROMA (Italy)

(**) **ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT**

2 Rue André-Pascal 75016- Paris (France)

1. Introduction

The importance of statistical information for democratic processes has been underlined by “public choice” models. The recent literature on the relationships between public opinion, political choices and the functioning of modern democracies argues that there are big differences in what the general public and specialists, such as economists, think about key issues. Increasing attention is given to public opinion, even when it is poorly informed.

Blinder and Krueger (2004) presented some evidence about what U.S. citizens actually know about key economic facts. They found that a significant number of Americans do not know very much about the country’s economic situation. They also tested a range of factors that might explain how people’s beliefs are shaped. They found that ideology was the most important determinant in shaping the public’s opinion, self-interest was the least important, and economic knowledge was in between. Therefore, their findings seem consistent with an idea from political science: people often use ideology as a short cut for deciding what position to take, especially when properly informing oneself is difficult. They conclude that “there is room for hope that greater knowledge will improve decision making, even though it appears from our survey that efforts in this direction have shown less than impressive results to date”.

Recent work relates more directly to statistics and their dissemination. Carroll (2003) tests a model of how empirical expectations are formed. His approach takes the news as the key provider of information on macroeconomic variables. He adds to this, firstly, the idea that people do not update their expectations and personal forecasts continuously but probabilistically. In addition, he looks at the role professional forecasters play in informing the media. Empirical work by Doms and Morin (2004) supplements Carroll’s (2003) analysis. These authors elaborate the role of the media. Particularly, they establish three important ways through which the media affects the public’s views on the state of the economy: (i) by conveying economic data and expert opinions; (ii) by sending a signal based on the tone of the economic report; and (iii) by the volume of reporting, which influences the likelihood of people updating their expectations (this adds to the signal value of the amount of reporting).

Following the Blinder and Krueger’s example, the OECD has promoted the first co-ordinated international survey on what citizens know about key economic statistics. The full results of the survey (carried out, in April 2007, in 29 European countries - by Eurobarometer - and US – by the University of Michigan) will be presented during the OECD World Forum.

This paper presents the results obtained for Italy through a survey carried out by ISAE in March-April 1997 on Italian citizens. In particular, section 2 introduces the OECD project on Measuring the progress of societies, presenting the companion surveys performed by Eurobarometer and the University of Michigan on the issues dealt with in this paper. Section 3 introduces the ISAE survey on Italian consumers and the questionnaire used for the OECD/ ISAE survey on statistical knowledge. Section 4 presents the results obtained at an aggregate level and section 5 introduces an econometric model of knowledge, in which an aggregate measure of statistical knowledge appropriately derived from survey results is regressed on socio-demographic characteristics of the respondents, the desire and willingness of being informed and the sources of information used. Some considerations on the results obtained conclude the paper.

2. The OECD Project on “Measuring the Progress of Societies”

As cited in Giovannini (2006), initiatives to measure progress at the international, national and local levels are proliferating all over the world in response to a growing demand for more meaningful measures of economic, social and environmental change and for more accountability of public policies and politicians. Meetings organised in every continent in preparation of the second World Forum, with more than 100 countries, as well as the enthusiasm demonstrated for this initiative by organisations and individuals working around the world in the public, private and citizen sectors, show that there is a concrete demand for a global community of practice for those wanting to measure progress.

The Project will achieve its mission through advocating the importance of this work, improving the state of the art on the measurement and dissemination of progress measures and assisting countries to undertake this work. There are four key goals:

- **Foster a global conversation about what progress actually means.** In order to measure and achieve progress, people need to know what “progress” looks like. There can be no single answer, but by bringing together different communities, cultures and interest groups the project will debate and recognise differing views and find common ground. Such a discussion will benefit anyone seeking to measure progress at the sub-national or national level, but it will be important at the global level too.
- **Galvanise people and institutions to action.** By bringing together an engaged global community of practice, the Project will facilitate the collaboration of diverse groups and the sharing of success stories about the development and use of progress indicators, thereby fostering the development of evidence-based public choice and a facts-based civic dialogue, improving the democratic functioning of modern societies.
- **Improve the effectiveness of indicator work and their use for policy making.** By sharing best practices among those working on indicator initiatives, and strengthening international comparisons, the Project will improve the ways in which indicator sets are developed, disseminated and, most importantly, used. In addition to a technical discussion about indicators, an important element of the project will be to foster the debate on the ways in which policies can be improved through the use of indicators.
- **Make a key contribution to the international discussion** in the run up to 2015 when the set of existing Millennium Development Goals and Indicators (mainly designed for developing countries) will be reviewed. The project will integrate the current top-down approach to the development of international indicators with a **bottom-up effort**, to take into account cultural, social and economic differences around the world.

To achieve its goals, the Global Project will carry out activities in the following areas:

- Carry out statistical research on the measurement of societal progress in all its dimensions;
- Design, develop and promote the use of innovative ICT tools to facilitate the transformation of statistics into knowledge;
- Establish a global network to foster the measurement of progress in each and every country;
- Develop a global infrastructure to facilitate the assessment of societal progress at national and global levels to bring about evidence-based policy discussions and decision-making.

More information about the Project is made available to Forum participants. In this context, the Project advocates the organization of an international survey on what the general population knows about key economic, social and environmental phenomena in their countries.

3. The ISAE consumers opinion survey: a methodological introduction

In the framework of an EU project harmonized by the European Commission¹, ISAE has been conducting since 1973 a monthly survey on consumers’ opinion. The survey consists of qualitative questions on the economic and personal situation of consumers. Questions generally allow five possible answers, ranging from strongly positive to strongly negative; results are usually expressed as weighted balances of positive and negative replies, assigning double weight to extreme (positive and negative) answers.

The survey is carried out via telephone and combined with Computer Assisted Telephone Interviewing (CATI) System; it is based on a monthly sample of 2, 000 Italian consumers, changing each month, for a total of 24, 000 persons interviewed per year. The sample is extracted from the public telephone

¹ For the complete questionnaire, see the DG Ecfm website at: http://europe.eu.int/economy_finance/indicators/business_consumers_surveys/userguide_en.pdf. See also Malgarini and Margani (2007), for a description of the ISAE survey.

book registers and selected on the basis of a two-stage technique: in the first step, it is stratified according to the zone of residence and the size of municipalities (see table 1); the second step is based on the selection of a specific consumer within the household selected in the first step. This selection is based on quota sampling according to gender (48.5% males, 51.5% females)².

Table 1: The ISAE sample

Geographic zone	Size of municipalities							Total
	Less than 5, 000	5, 000- 10, 000	10,001- 20,000	20,001- 50,000	50,001- 100,000	100,001- 500,000	More than 500,000	
North West	57	23	22	35	19	4	53	213
Centre-North	76	59	53	53	25	15	45	326
North-East	70	73	76	46	28	90	0	383
Centre	44	41	51	76	49	42	88	391
South	78	59	76	97	82	41	32	465
Islands	35	29	28	51	25	32	22	222
Total	360	284	306	358	228	224	240	2, 000

For the aggregation of individual replies, ISAE has recently proposed a double-weighting system based on probability and post-stratification weights (see Fullone and Martelli, 2006). More specifically, probability weights are the inverse of the selection probability; they are used to correct for possible selection bias deriving from unequal selection probabilities, linked to the nature of the list of reference and the size of the family selected. On the other hand, post stratification weights aim to correct for possible representativeness problems deriving, for instance, from the fact that unemployed and retired people are easier to contact than employee or self-employed. To correct for this kind of bias, ISAE uses an ex-post calibration method based on auxiliary information derived from official structural population statistics: more specifically, we make use of auxiliary information about size of municipality, geographic region, education, type of occupation and age of the respondents.

4. The OECD/ISAE survey on statistical knowledge

In March and April 2007 surveys ISAE in collaboration with the Statistics Directorate of OECD, has added a number of questions on the knowledge of some key statistical and demographic figures, together with three questions that aim to measure respectively, the willingness/desire to be informed about statistical issues and the media tools that are used to obtain such information.

4.1 The Questionnaire

The March questionnaire focussed on the knowledge of official figures for key economic variables such as GDP growth, inflation, unemployment rate, deficit to GDP ratio, and the Euro/ Dollar exchange rate. The April questionnaire, while repeating the questions on GDP growth, Inflation rate, willingness and the media used to acquire information, engaged on the knowledge of key demographic variables such as the size of Italian population and life expectancy at birth. Some other questions on structural aspects of the economy (concerning respectively air pollution, students' literacy and R&D expenditure) were also added to the April questionnaire³. Questions on economic figures were generally quantitative, i.e. we simply asked about the knowledge on the most recent published value of a given variable, as for the GDP question reported below:

- *ISTAT has recently published the official figures for Italian GDP growth in 2006. Can you tell us the rate of growth of Italian GDP in 2006?*

² With quota sampling, response rates are always equal to 100%: non responses lead to replacement in the sample until the quota is achieved. In the case of the ISAE survey, in order to achieve the goal of 24, 000 interviews each year a total of 120, 000 consumers are extracted from the telephone registers according to the stratification outlined above.

In the case of the Euro/ Dollar exchange rate we preferred to ask a qualitative question structured on a Likert scale about the increase/ decrease of the exchange rate:

- *One year ago 1 Euro was worth 1.20 US Dollars. In other words, with 1 Euro it was possible to buy 1.20 Dollars. Can you tell us if the Euro is now worth more or less than 1.20 dollars; in other words, do you think that now with 1 Euro you can buy more, an equal amount or less than 1.20 Dollars?*

Questions on demographics issues, which are quantitative as those on GDP and respondents were asked to choose among different possible answers, each indicating a possible interval of values. For example:

- *Life expectancy at birth is an important indicator of the welfare of a country; according to official statistics, can you tell us how many years a person born today in Italy may expect to live? Please tick one of the following options:*

- Less than 60 years
- Between 60 and 65 years
- Between 66 and 70 years
- Between 71 and 75 years
- Between 76 and 80 years
- Between 81 and 85 years
- Between 86 and 90 years
- More than 90 years
- Don't Know
- Refuse to answer

In both the March and April's questionnaires, two sets of questions intended to measure, respectively, the importance attributed to economic information (from "extremely important" to "not important"), the desire to be informed (yes/ no) and the main channels used to acquire information (possible answers being TV; newspapers; internet; radio; friends and relatives; political and civic leaders) were added to the existing list.

4.2 Participation rates and aggregate results: quantitative questions

Questions have been proposed alternatively in March and April, with only those on GDP, inflation and on the desired to be informed/media repeated for both the questionnaires. In order to reach a better assessment on the quality of the survey, for each question, respondents refusing to answer were distinguished from those answering "I don't know" to the given question. Table 2 reports the main results for the quantitative questions; response rates are on average quite low, as it is common in this kind of surveys (see Blinder and Krueger, 2004); it is interesting to note that on average around 30% of the respondents refer to questions on inflation and on the unemployment rate, whereas only a 13.8% to the deficit to GDP ratio. However, most of the people refusing to answer are claiming that they are not capable of reporting an appropriate value, that is to say that they refuse to answer simply because they do not know the answer to that specific question.

Knowledge about the phenomena of interest

After having weighted the results so to consider possible selection bias and representative problems, Italian consumers tend to be slightly "over-optimistic" when reporting about the GDP growth rate and over "pessimistic" for inflation and, especially, for the unemployment rate and the deficit to GDP ratio: a 3.8% average rate is reported for inflation (as opposed to the 1.8-1.7 % official figures for March/ April 2007), whereas an over-estimated 14.5% (official figure 6.8%) and an 8.5% (official figure 4.4%) are the reported figures for unemployment and deficit to GDP ratio. The overall answers are strongly skewed to the right; in such cases, the sample mean is not an accurate estimator of population results, as it is confirmed by the fact that the mean is always greater than the median of the distribution. In this sense, the median may be considered as a more accurate estimator of sample results: indeed, Italian consumers are shown to have an accurate "median" knowledge of official GDP data since the median is equal to 2 (1.9) in March (April); also

median inflation assessments result to be fairly accurate- Italian consumers report a median of 2.2 inflation rate, only slightly overestimating the true value.

Table 2- Statistical Knowledge - Quantitative questions

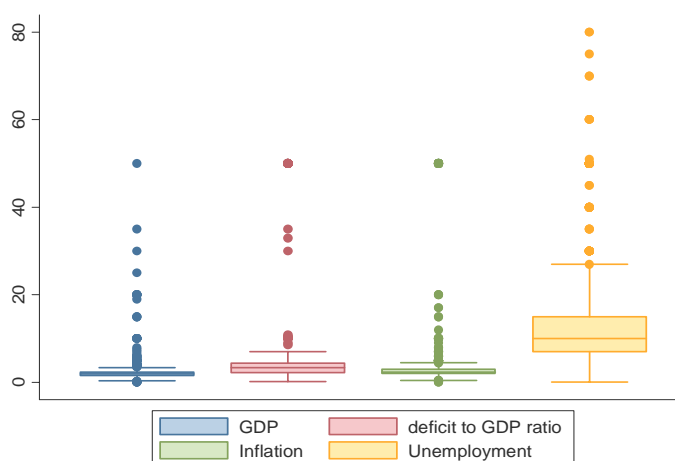
	GDP			Inflation			Unempl	Deficit/ GDP
	March	April	Average	March	April	Average	March	March
Response rate (%)	27	19.2	23.1	32.6	23.6	28.1	32.1	12.7
Don't know (%)	70.5	72.8	71.7	65.1	68.8	66.9	65.4	84.5
Refuse to answer (%)	2.5	8	5.2	2.3	7.6	5	2.5	2.8
Average	2.7	2.1	2.5	4.5	2.9	3.8	14.5	8.5
Median	2	1.9	2	2.4	2.1	2.2	10	3.4
P25	1.5	1.3	1.5	2	1.9	2	7	2
P75	2.4	2.2	2.2	3	3	3	16	4.4
Std. Dev.	3.7	1.8	3.1	8.7	2.9	6.9	13	14.5
True value	1.9*	1.9*		1.8**	1.7***		6.8****	4.4*

(*) 2006, (**) February, (***) March, (****) III Quarter 2006, seasonally adjusted.

Overestimation is much more severe for unemployment, where the median unemployment rate is equal to 10% whereas the true value is 6.8%: a possible interpretation for this is that people are still not fully aware that unemployment in Italy is now well below the – probably psychologically important – 10% threshold, and it has been like this since 2001, after almost 10 years of double-digit unemployment figures (i.e., the 1992-1993 recession). On the other hand the “median” consumers underestimate the official figures for the Maastricht parameter accounting for the state of public finances in Italy in 2006. In this case, it is possible that the underestimation is linked to the fact that besides the 4.4 figure for 2006, ISTAT has also disseminated a lower figure for the same variable –2.4 – corrected for “out of the ordinary” expenditures.

Figure 1 – Box plot distribution

GDP growth, Inflation, Deficit to GDP ratio, Unemployment



Across all four subjects, the geographical distribution of the respondents is quite homogeneous, while a clear gender gap emerges: male response rates is always at least double than female (40% versus 20%), with the exception of the question about deficit/GDP, where female responses drop to 6% (male 21%). People aged 30-64 replied two times more than the older part of the sample. A clear difference emerges with respect to the degree of education: those who hold a university degree have a response rate three times higher than those with a primary education (four times for the question on the deficit/GDP ratio).

Income level also affects response rates. Those who earn more than 3,000 euros have a response rate for GDP and deficit/GDP three times higher than those who earn less than 1,500 euros per month, but smaller differences appear for questions about inflation and unemployment. Those who are self-employed present the highest response rates, up to twice higher than those of people unemployed or out of the labour force.

Socio-economic conditions also affect the precision of answers. For example, it is interesting to note that females indicate higher GDP growth (2.9) than males (2.6), inflation (5.9 and 3.7 respectively), unemployment (18 vs. 12.2) and deficit/GDP ratio (10.9 vs. 7.1). Females also present higher standard deviations for all variables.

Uncertainty

More generally, both standard deviation and the interquartile difference (i.e. the difference between the 25th and 75th percentile of the distribution answers, often interpreted as a proxy to the variance of the distribution) indicate that Italian consumers are highly hesitant about the official figures on the deficit to GDP ratio and the unemployment rate; dispersion around the mean is much lower for the knowledge on GDP growth and inflation. As a confirmation of the hypothesis of learning outlined above, the standard deviation is falling steadily between April and March for GDP growth (i.e., one month after data dissemination), possibly also in relation to the observed decline in the response rate. In other words, it is possible that two opposite forces are taking place here: learning may ensure – for instance thru media discussions on the data – a more accurate knowledge after some time that the data are officially available; on the other hand, for the less attentive citizen, the time elapsed from the moment the data have reached the “headlines” implies a “I don’t know” reply rather than an inaccurate evaluation on the phenomena of interest.

4.3 Participation rates and aggregate results: other quantitative and qualitative questions

As expected, participation rates are much higher when we consider other quantitative questions (i.e. those in which the respondents have to choose among different alternatives) and some qualitative questions. Questions on life expectancy, Co2 emissions and students’ literacy levels are the most “successful” in terms of response rates, with those on population and R&D expenditure receiving the lower level of answers. Also in this case, the proportion of the sample that refused to answer is quite low, confirming on average the quality adequacy of the estimations.

Knowledge on the exchange rate and R&D expenditure

Concerning the more economic-oriented questions – those on the Euro/ Dollar exchange rate and the R&D expenditure in Italy – people show an adequate qualitative knowledge of the underlying phenomena (table 3): over 40% of the sample reports that the exchange rate is increased with respect to the 1.20 figure of twelve months before; similarly, almost half of the sample (48.7%) correctly reports that R&D expenditure of both the public and private Italian sector is lower than the European average. However, almost a 20% of the Italian consumers report that the exchange rate is “stable” and a significant 13% state it is actually decreased with respect to 12 months before. On the other hand, only a small proportion of the population (as low as 5%) believes that Italian firms and the Government spend in R&D more than our European competitors, albeit more than 17% of them think that expenditures are equal to the European averages.

Knowledge on socio-demographic statistics

People’s knowledge on demographic variables results to be quite unsatisfactory: only a very small proportion of the sample (as low as 4.5%) correctly reports that Italian population is between 58 and 59 millions; more than 10% of Italian consumers (the mode of the distribution) affirms that population is “above 60 millions”, and another 9.2% estimates it “in-between 59 and 60 millions” (with smaller groups reporting possible values below the “true” one). On the other hand, almost 32% of Italian consumers correctly estimate life expectancy at birth ranging between 76 and 80 years (the mode of the distribution), with almost the same amount of people reporting values (well) below or above the “true” one.

Concerning Co2 emissions, people correctly reports that emissions have increased in the last five years; however they overestimate the impact of such increase which seems to be particularly “strong” for over 61% of the respondents. Finally, as for students’ literacy (OECD, 2003), almost 40% of Italian consumers correctly perceive that they are “under-qualified” with respect to their European counterpart.

However, 8% of the sample claims that students are “much less qualified” and almost a 27% that they are “equally qualified”.

Table 3 – Response rate on qualitative questions

	Response rate	Don't Know	Refuse to answer	Weighted Survey answers (true values in bold)	
Euro/ Dollar (%)	73.1	25.3	1.7	Increased	40.1
				Stable	19.8
				Decreased	13.2
R&D Expenditure (%)	71.4	26.6	2	Higher	5.1
				Equal	17.7
				Lower	48.6
Population (%)	63.4	34.5	2.1	Between 50ml and 58ml	39.5
				Between 58ml and 59ml	4.5
				More than 59ml	19.4
Life expectancy (%)	77.4	20.4	2.2	Less than 76 years	23.5
				Between 76 and 80 years	31.6
				More than 80 years	22.3
CO2 emissions (%)	89.7	8.5	1.9	Increased a lot	61.5
				Increased	16.4
				Stable	8.7
				Decreased	0.4
Literacy (%)	78.5	19.5	2	Decreased a lot	2.7
				Much more qualified	5
				More qualified	6.7
				Equally qualified	26.9
				Less qualified	31.8
				Much less qualified	8.1

4.4 How important is knowledge for Italian citizens, and how does they know it?

The last part of the questionnaire, common to both March and April surveys, concentrates on the desire of Italian consumers to be informed, and on the main media used to acquire such information. Table 4a reports survey results for the desire and importance of being informed: 46% of Italian consumers think that it is “important” to be informed, but only 8% of them believe that it is “extremely important”, a result much lower than that obtained in an analogous survey for the United States⁴ where almost 24% of the sample believed that information is “extremely important”. Moreover, more than 15% of the sample believes that it is not important to be informed, and over 40% of people are not interested in being more informed on such issues.

Finally, table 4b reports the media used more often to acquire such information; television is by far the most frequently used channel of information, mentioned by over 82% of Italian consumers. Newspapers and periodicals are important for almost the 52% of the population, followed by Internet (23.3%) that – quite surprisingly – precedes the radio (18.6%) as well as conversations with friends and relatives (11.2%) and political leaders (7%). Also in this case, the comparison with the US data is remarkable, showing that Italian consumers pay comparatively much less attention to informal information channels such as political and civic leaders opinions (cited as important sources of information by over 45% of the US sample) and discussions with friends and relatives (cited by over 35% of the sample in the US survey). On the other hand, television strongly dominates all the other media, also in comparison with the US data, according to which only the 61% of the sample use it regularly to acquire such information.

⁴ See Blinder and Krueger, 2004.

Table 4a- Importance of knowledge and desire to be informed

How important is to be informed on the issues we have discussed so far?	Average (%)
Extremely important	8.21
Very important	24.43
Important	46.05
Not very important	12.39
Not important	3.2
Don't know	3.96
Refuse to answer	1.77
Would you like to be more informed on these issues?	
Yes	54.84
No	40.44
Don't Know/ Refuse to Answer	4.72

Table 4b- Information channels (%)

Information channels	%
Television	82.05
Radio	18.58
Newspapers, periodicals	51.94
Internet	23.27
Political, opinion leaders	6.99
Friends, relatives	11.19
Don't know	2.35
Refuse to answer	1.8

5. An Econometric model of knowledge

Section 4 has introduced a description of survey results, providing some first interesting insights of the quantitative and qualitative level of knowledge of Italian consumers about important socio-economic variables such as GDP, inflation, the Italian population, life expectancy and so forth. This section will then move a step forward trying to assess the determinants of people' knowledge, assuming that this is influenced by socio-demographic characteristics of the respondents, their desire to be informed and the media they use to acquire the relevant information. However in order to derive and estimate such a model, a synthetic measure of knowledge based on the data previously presented needs to be built.

5.1 The Knowledge score

Theory

The intuition behind the construction of our knowledge measure, named "knowledge score" after the work of Blinder and Krueger (2004), is that for each question on knowledge a score is assigned to each respondent based on the accuracy of his/ her answer. As a starting point, we consider only the quantitative questions listed in the March survey, namely those on GDP growth rate, inflation, the deficit to GDP ratio, the unemployment rate and the Euro/ Dollar exchange rate; we therefore limit our sample to the 2, 000 people that answered to the March survey. The sample is further reduced by the amount of missing values emerging for both questions.

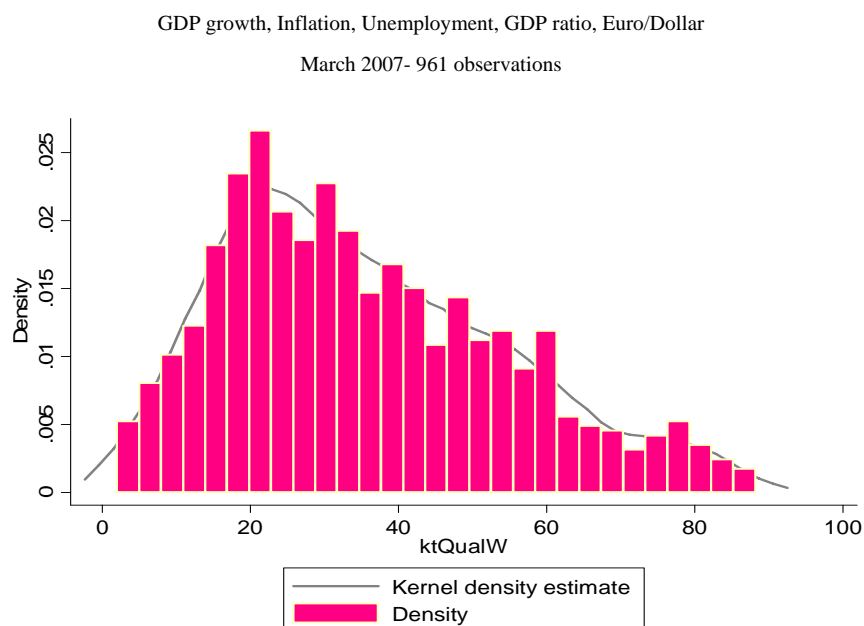
In literature, there are different methods to assign a score to a population sample, based on the results achieved in some kind of test, such as this survey on economic knowledge (Percentile Ranks, Standard Point (z), Normalised Standard Point, T point, Stanine Point). Generally speaking, when the distribution of the results is not normal or particularly skewed, as it was the case for the knowledge questions, the Percentile Rank method is employed.

The Percentile Rank⁵ is a simple method that results in an ordinal measure of survey answers. First of all, we calculate the absolute value of the individuals errors (i.e., the difference between the individual answer and the official data), and then individual errors are sorted calculating a “raw score”. In the final step we calculate the percentile rank on the basis of the ordinal position of the “raw score”, weighting to correct for possible sampling bias⁶ and assigning a higher rank the lowest the absolute value of the error. The resulting percentile rank gives an idea of the position of a respondent in the sorted sample. For example, a respondent which has a test result (“raw score”) better than 90% of the sample is said to be at the 90th percentile of distribution answers.

Implementing the knowledge score to the survey data

The Knowledge Score is built on March data, including the quantitative questions on GDP, Inflation, Deficit/ GDP ratio and unemployment rate, together with the qualitative question on the Euro/ Dollar exchange rate. As an example, let us consider the first question about GDP growth; the response rate is roughly equal to 25% and the sample reports a slight overestimation of the true value. As a first step, we compute the absolute value of the error and consider it as a raw score. Secondly, we assign to each answer a percentile rank based on people’s accuracy, giving the lowest percentile rank score to the greater error (consequentially, the highest percentile rank is assigned to the lowest error). We then derive the distribution of percentile ranks. In the next step, we assign a “zero point” label to people not answering that particular question. After repeating the experiment for the other questions comprised in the March survey, we can finally evaluate the aggregate Knowledge score as the average of the 4 different scores calculated for each question (Fig. 2). In this case we find that there are 961 meaningful respondents in our sample, which answered to at least one of the five economic questions. The mean of the aggregate knowledge score distribution is 35.6 and its standard deviation is equal to 19.8.

Figure 2 - Distribution of aggregated knowledge scores – Kernel Density Estimate superimposed



⁵ The mathematical formula for the percentile rank (PCTRank) is the following:

$$PCTRank = \frac{cf_i + 0.5(f_i)}{N} * 100$$

where cf_i is the cumulative frequency for all raw scores lower than the raw score of interest, f_i is the frequency of the score of interest, and N is the number of examinees in the sample. See Crocker & Algina (1986).

⁶ In addition to the weights described in section 3 above, at this stage we also weight according to gender, given the fact that response rates for the knowledge questions were higher for men than for women.

5.2 The model and its econometric outcomes

Once the appropriate aggregate measure of statistical knowledge is derived, we proceed studying the determinants of knowledge according to the demographic characteristics of the respondents and their desire of being informed. More specifically, the model is:

$$K_i = f(SD_i, D_i, S_i) + u_i \quad (1)$$

Where K_i is the knowledge score, SD_i are the socio-demographic characteristics of the respondent, D_i is the desire of being informed and S_i is the source they use for being informed. The unobserved error term u_i is assumed to be uncorrelated with the covariates; on the other hand we allow residuals to be heteroschedastic and we use robust methods in the OLS estimates.

We consider as control variables information extracted from the ISAE consumers surveys concerning gender (M/F), age (4 classes, from <30 years to 65+), zone of residence (North West, North East, Centre and South), employment status (4 categories, employees and self-employed, unemployed and inactive people), level of education (3 classes, lower, intermediate and University level) and income (divided into quartiles). Desire to be informed and the channels used to acquire information are measured on the basis of the answers provided to the survey questions.

Table 5 reports the results obtained using OLS; a total of 961 observations are available for estimation. We normalize with respect to male respondents, being dependent workers, in the first income quartile under 30 years of age, living in the North West of Italy, with the lowest education and having answered that information is extremely important and that they do not want to be informed more about these issues. In this sense the constant term may be interpreted as the average knowledge score for this very specific sub-group of the sample, and the coefficients of the various dummies represent – if significant – the increase/ decrease in the knowledge score that may be associated with the possession of the specific characteristic that the dummy itself represents. OLS regressions are able to explain more than 26% of the total variability of the knowledge score.

Results are broadly in line with what it may be expected: knowledge of Italian consumers is significantly influenced by professional category, age, gender, zone of residence, education and personal income. It is much lower for women than for men and for Southern residents, being instead higher with higher education, for independent workers and inactive people (among which there are the students) and for people between 30 and 65 years of age. We do not find on the other hand any significant influence of income: in fact, it is possible that people are not particularly willing to provide information about their income, as it is testified by the relatively high non response (24% in March 2007) to this question.

Table 5 – OLS regressions for Economic Knowledge Score (K)

Variables	K-Score (GDP, Inflation, Unemployment, Deficit/GDP) March Survey				
	Coefficient	Std. Dev	t		
Constant term	29.94	3.37	8.88	***	
<i>Socio-demographic controls</i>					
Professional category (baseline: employed)					
Self employed	4.1	1.76	2.33	**	
Unemployed	1	1.06	0.94		
Out of labour force	1.35	0.38	3.54	***	
Age (baseline: up to 30 years)					
30-50 years	4.01	2.1	1.91	*	
50-65 years	9.49	2.15	4.41	***	
> 65 years	1.88	2.35	0.8		
Gender (baseline: Male)					
Female	-12.08	1.12	10.75	***	

Zone of residence (baseline: North-West)				
North-East	0.01	1.62	0.01	
Centre	-0.94	1.6	-0.59	
South	-5.7	1.46	-3.91	***
Education (baseline: primary school)				
High School or less	5.05	1.27	3.99	***
University degree	8.72	1.89	4.62	***
Income (baseline: 1 st quartile)				
Second Quartile	-0.25	1.56	-0.16	
Third Quartile	0.7	1.57	0.44	
Fourth Quartile	2.03	1.51	1.34	
<i>Importance and desire of being informed</i>				
Importance of being informed (baseline: Extremely important)				
Very Important	-1.8	1.99	-0.9	
Important	-7.42	1.86	-3.98	***
Not very important	-11.45	2.47	-4.64	***
Absolutely not important	-19.29	4.15	-4.65	***
Desire to be more informed? (baseline: No)				
Yes	0.71	1.26	0.56	
<i>Information channels</i>				
Television	0.43	1.58	0.27	
Radio	1.39	1.37	1.01	
Newspapers	5.15	1.15	4.46	***
Internet	2.95	1.47	2	**
Political, civic leaders	-2.08	1.73	-1.2	
Friends, relatives	-0.19	1.74	-0.11	

Number of available observations: 961

$R^2=0.26$

Statistically Significance: * = 10%, ** = 5%, *** = 1%

People attributing lower importance to being informed are also those scoring worst results, whilst the declared desire of being informed does not significantly influence the results. As for the main information channels, a “knowledge divide” runs between those that are currently reading newspapers and magazines and those that are not, with the former realizing a much higher score than the latter; also the use of the Internet has a positive impact on the knowledge of Italian citizens. All the other channels do not significantly influence the results.

6. Conclusions

This paper represents a first attempt to evaluate to what extent Italian citizens know official statistics concerning key economic variables. The results indicate a very little capacity of indicating, in quantitative terms, growth rates or levels of variables very often quoted in the public debate and frequently reported by media. Better results are obtained when people are asked to indicate, in qualitative terms, trends or levels of various phenomena. Differences in people’s knowledge largely depend on socio-economic conditions, as well as on cultural attitudes and the channels used to access information.

These results should be taken very seriously by official statisticians, media and policy makers. Statisticians should rethink about their communication strategies, as well as the necessary investments to increase the statistical culture of citizens. Media should also think about new ways to make their communication on key economic figures more effective, especially vis-à-vis the more disadvantaged groups. Finally, policy makers should think about new ways to foster civic engagement and improve people’s understanding of the main challenges faced by the country, as well as of alternative policy proposals.

References

- Blinder A.S. and Krueger A.B. (2004), “What does the people Know About Economic Policy, and How Does It Know It?”, *NBER Working Paper* n. 10787, September.
- Carroll C.D. (2003). “Macroeconomic expectations of households and professional forecasters”, *Quarterly Journal of Economics*, 118 (1), pp. 269-298.
- Crocker, L. and Algina, J. (1986), “Introduction to classical and modern test theory”, Harcourt Brace College Publishers.
- Doms M. and N. Morin (2004), “Consumer Sentiment, the Economy, and the News Media”, FRBSF Working Paper 2004-09, San Francisco: Federal Reserve Bank of San Francisco.
- Fullone, F. and Martelli M. (2006), “Re-Thinking the ISAE Consumer Survey Processing”, paper presented at the 28th CIRET Conference, Rome, September.
- Giovannini, E. (2006), “Statistics and Politics in a *Knowledge Society*”, OECD working paper, Paris.
- Malgarini M. and Margani P. (2007), “Psychology, Consumer Sentiment and Household Expenditures: A Disaggregated Analysis”, forthcoming in *Applied Economics*.
- OECD (2003), “PISA Assessment Framework: Mathematics, Reading, Science and Problem Solving Knowledge and Skills”, OECD Paris.