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Results of first coordinated international surveys on what people know about  
key statistical indicators produced by official statistics

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## 1. Overview<sup>1</sup>

At the end of the recent “Second World Forum on Measuring and Fostering the Progress of Societies”, the OECD, the European Commission, the Organisation of the Islamic Conference, the United Nations, the UN Development Programme and the World Bank affirmed in a declaration their commitment to measuring and fostering the progress of societies in all dimensions, with the ultimate goal of improving policy making, democracy and citizens’ wellbeing. In fact, according to the Istanbul Declaration<sup>2</sup>, official statistics have to be considered as a key “public good” and a culture of evidence-based decision making has to be promoted at all levels in order to increase the welfare of societies. In this sense, the availability of statistical indicators of economic, social and environmental outcomes and their dissemination to citizens can contribute to promoting good governance and improve the democratic process.

However, 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 think about key economic issues. Indeed, Blinder and Krueger (2004) 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”.

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 results of the survey carried out in 29 European countries by Eurobarometer and more specifically for Italy by ISAE are presented in this paper (see also Fullone, Gamba, Giovannini, Malgarini, 2007; Papacostas, 2007). Results for the US are presented in a companion paper by Richard Curtin of the University of Michigan. In particular, section 2 introduces the OECD project on Measuring the progress of societies; sections 3 and 4 present Eurobarometer and ISAE results, the latter complemented by further evidence on the specific knowledge of inflation phenomena. Section 5 finally 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 Global Project on “Measuring the Progress of Societies”

In June 2007, an exceptional group of 1200 people from about 130 countries gathered in Istanbul to attend the second OECD World Forum on “Statistics, Knowledge and Policy”. With the Istanbul declaration released at the end of the Workshop, the OECD, the European Commission, the Organisation of the Islamic Conference, the United Nations, the UN Development Programme and the World Bank affirmed that A culture of evidence-based decision making has to be promoted at all levels of government, to increase the welfare of societies. In order to reach this goal, the OECD is launching a Global Project on “Measuring the Progress of Societies”. 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

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<sup>1</sup> This paper is based on the works of Fullone, Gamba, Giovannini, Malgarini (2007), Malgarini (2007), Papacostas (2007).

<sup>2</sup> See OECD (2007).

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.

The time frame to achieve these goals is 2007-2015; in this period, the Global Project will carry out activities in the following areas:

1. Statistical research on the measurement of societal progress in all its dimensions; in this respect, the main objectives are to:
  - 1.1. Develop recommendations on **how to measure the progress of societies** using different approaches;
  - 1.2. Develop recommendations on **how to measure specific phenomena**;
  - 1.3. Establish a **knowledge base** on existing measures of progress at international, national and sub-national level;
  - 1.4. Publish **comparative analyses** of existing progress measures and projects to identify commonalities, differences, innovative frameworks and approaches, etc.;
  - 1.5. Publish comparative results based on an **international survey** on what citizens know about the progress of their society
2. Design, develop and promote the use of innovative ICT tools to facilitate the transformation of statistics into knowledge; the activities will include the development of:
  - 2.1. **Innovative software** to improve users' capacity to visualise and analyse statistical indicators;
  - 2.2. **Knowledge base** about innovative ICT tools to facilitate the access to and the understanding of economic, social and environmental indicators;
  - 2.3. **Partnerships with national and global media** to improve the dissemination of statistical information to citizens;
  - 2.4. **International exhibitions** on innovative tools to transform statistics into knowledge, during the World Forum events, every two-three years.
3. Establish a global network to foster the measurement of progress in each and every country; in particular, OECD aims to:
  - 3.1. Prepare a set of Recommendations on **how to build initiatives** aimed to measure the societal progress through the involvement of different components of the society (government, opposition, civil society, etc.);
  - 3.2. Organise **working groups** in the different regions of the world, where experience on these issues can be shared and discussed, good practices identified, etc.;
  - 3.3. **Give support to countries and regions** who want to establish initiatives to measure progress, providing training courses, scientific advice, software to present indicators, etc.
4. 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.
  - 4.1. A **global 2.0 web-based technical infrastructure** where:
    - 4.1.1. Progress indicators would be made accessible to citizens all over the world;

- 4.1.2. Users could interact with indicators using attractive graphical interfaces and other analytical tools, and launch global conversations based on solid and comparable statistical information, etc.
- 4.2. World and regional events:
  - 4.2.1. To stimulate statistical and policy discussions on societal progress;
  - 4.2.2. To promote the development and use of progress indicators.

In the following, first results of a European and an Italian survey on knowledge of statistical data are presented; they may be considered as a first step towards the development of an international survey on what people know on progress of societies, as stated in the point 1.5 above.

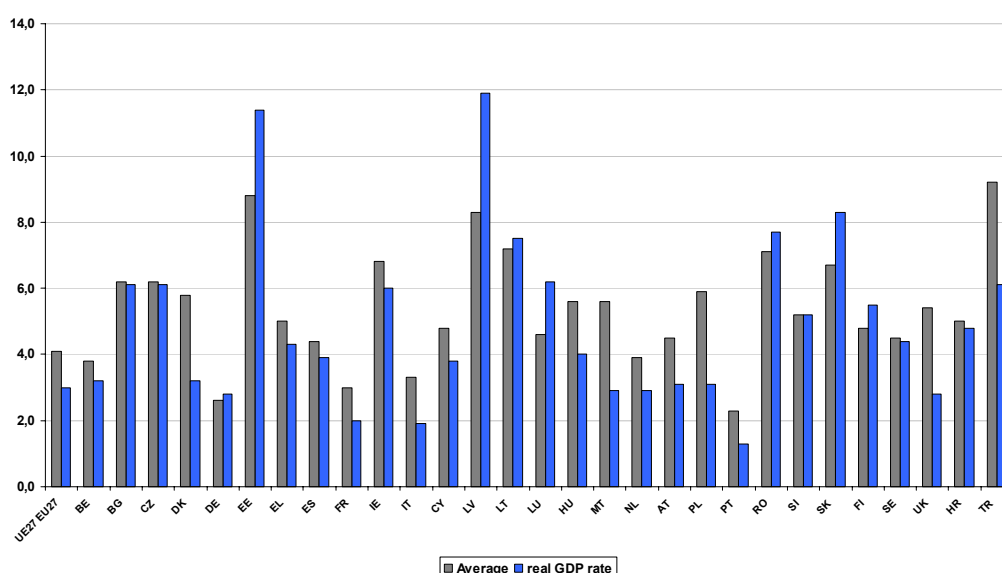
### 3. The Eurobarometer Survey

In the framework of the standard Eurobarometer survey, performed in April-May 2007, a number of questions have been added regarding the knowledge of key statistical indicators; three questions enquired also whether it is “necessary” to know this information, and whether political decisions are made on the basis of them. A final question concerned the general level of trust the public has in official statistical data.

#### 3.1 Knowledge of statistical data

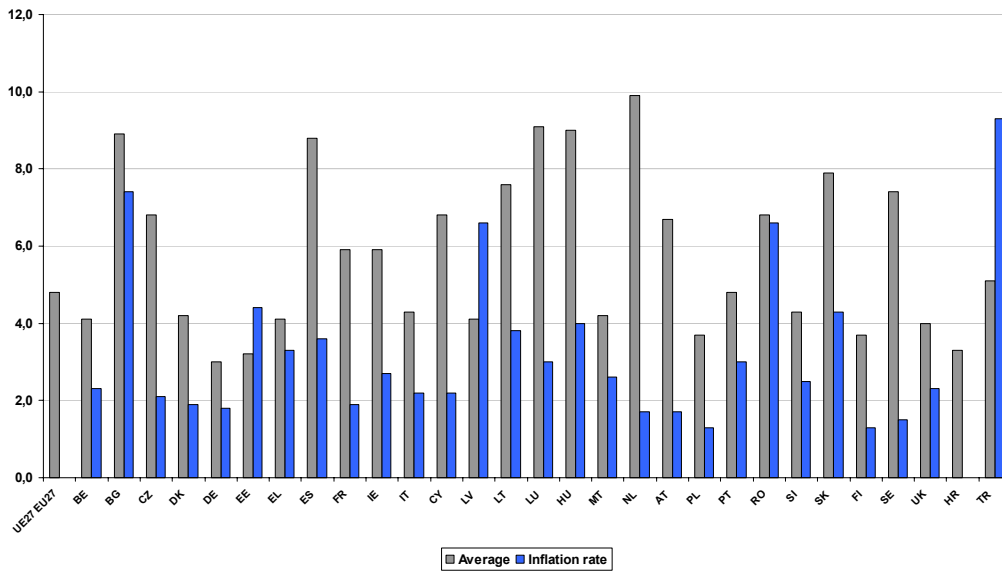
As first evidence, a large majority of people reported that they “do not know” about official data on GDP and Unemployment; on the other hand, people tend to affirm that they know about inflation, even if the share of wrong answer exceeds 50% in all countries. The percentage of people not knowing official figures ranges from more than 85% of people in Romania concerning the unemployment rate, to less than 10% in Greece for inflation. Figures 1-3 report the average results obtained; for each variable, we also provide the “true” official data released by the National statistical agencies. Looking at fig. 1, people claiming that they do know about the rate of growth of their country provide indeed a quite accurate assessment; however, a severe underestimation of GDP growth emerges in Baltic countries, while people from the United Kingdom, Turkey, Poland, Austria, Denmark and Italy tend to be more optimistic, indicating a rate of growth remarkably higher than the true outcome.

**Figure 1 – GDP growth, 2006**

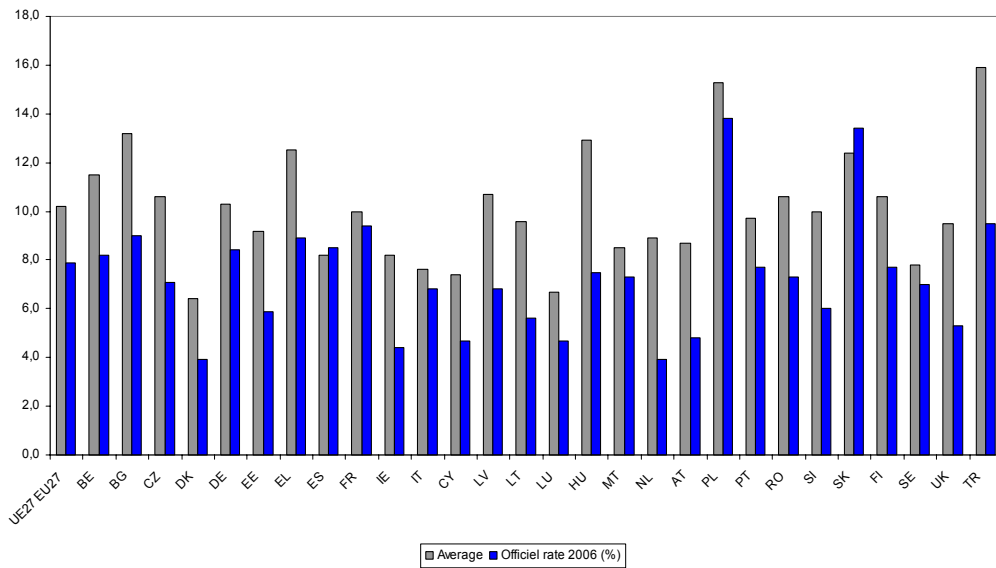


On the other hand, looking at inflation statistics (fig. 2) a widespread overestimation of the true inflation rate do emerge, particularly severe in countries like the Netherlands, Spain, Austria, Italy and most of the countries from Eastern Europe. The only countries were people tend to underestimate the true inflation rate are Turkey, Latvia and EE. Finally, concerning the unemployment rate, people generally tend to be “pessimistic”, reporting figures on average higher than the true outcomes; this is particularly true for Hungary, Turkey, Greece, Baltic States and the Netherlands, the only exception being the assessment of people from SK reporting an estimate of the unemployment rate lower than the actual data.

**Figure 2 – Inflation rate, 2006**



**Figure 3 – Unemployment rate, 2006**



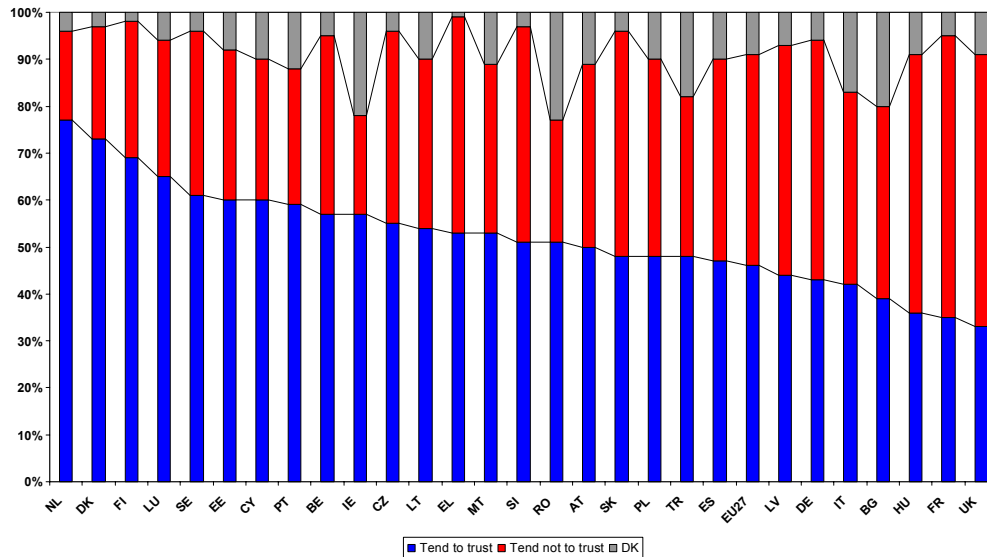
Generally speaking, the survey shows that the knowledge on official statistics about GDP and, especially, the unemployment rate is rather poor, with a large majority of people being unable to answer; moreover, in the case of unemployment, those asserting that they are informed about the phenomena actually overestimate the true statistic released by official agency. For inflation, even if people are generally more confident about their own knowledge of official data, a severe overestimation do emerge, particularly striking in some of the countries considered<sup>3</sup>.

<sup>3</sup> Moreover, it should be pointed out that the Eurobarometer question refer to the “knowledge” of the phenomena, and not to the perception of the consumers: for inflation, Linden (2006) has shown that assessments of European consumers (i.e., what they believe is the true inflation rate) is much higher than what emerges from Eurobarometer data. See also below and the contributions by Malgarini (2007) and Del Giovane, Fabiani and Sabbatini (2007) concerning Italian data.

### 3.2. Trust in official statistics and in the political process

The Eurobarometer survey adds three questions on the level of trust the public assign to official statistics and on the value the people themselves and the politicians assign to them. More specifically, fig. 4 reports the general level of trust the public has in official data: an high between-countries variability do emerge, with people residing in northern European countries generally reporting higher level of trust with respect to those living in large countries such as the Uk and those of continental Europe (France, Italy, Germany, for which less than half of the population declares to trust official statistics).

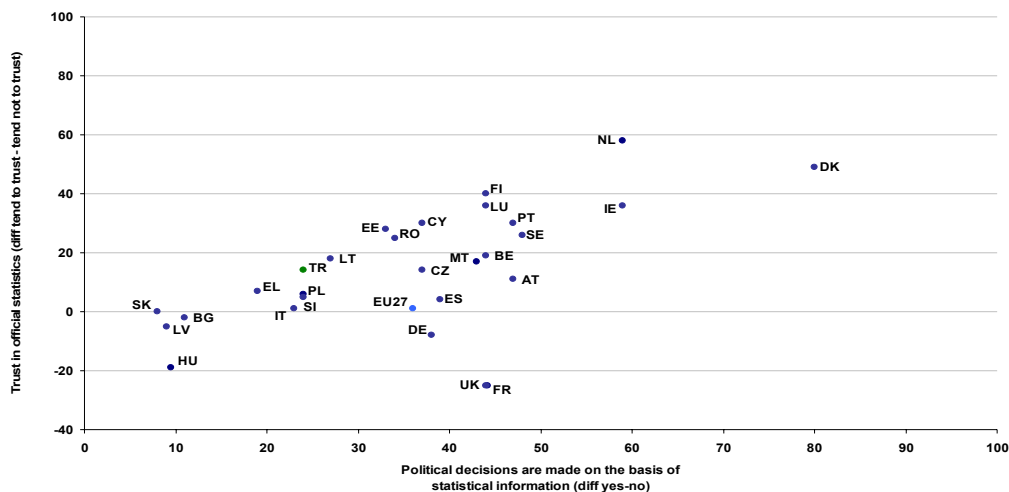
**Figure 4 – Trust in official statistics**



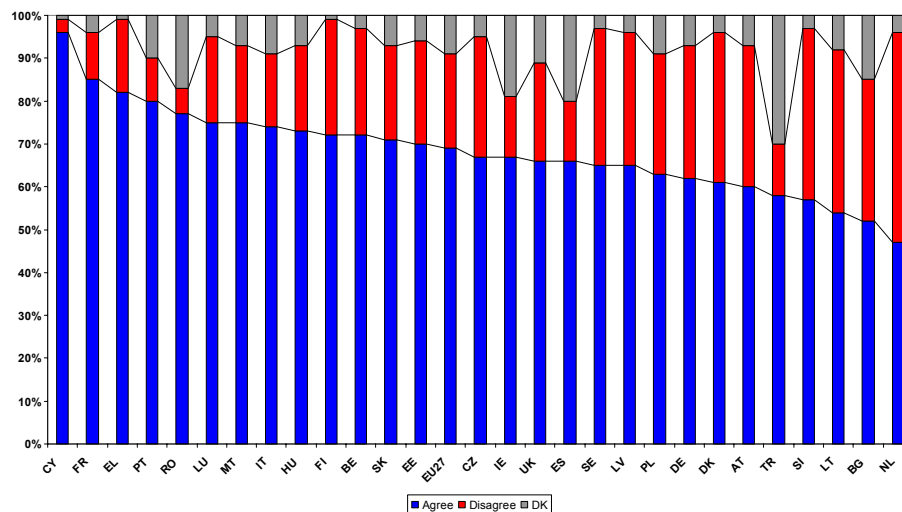
Interestingly, it also emerges a clear correlation between trust in statistics and the idea that political decisions are made on the basis of them (fig. 5): in countries like Denmark and the Netherlands people think that statistics are trustable, and also that political decisions are made considering them carefully. At the other end of the spectrum, trust in statistics is rather low in most Eastern European countries and, among the largest countries, in Italy; in the same countries, only a small percentage of the population (below 20%) actually believes that politicians make their decisions basing on the consideration of official data.

However, countries (like the Netherlands, Belgium) claiming both a high trust in statistics and a high use of them for political decisions often report a low interest in knowing the information; on the other hand, interest is high among those (like people in Eastern European countries, France, Italy) declaring a low trust in official data and in decision-making process (fig. 6). A possible interpretation is that in countries where data are trusted the perception of the necessity to know these data is low because people already think that the political process is based on them: in other words, in a public choice framework, people delegates the knowledge of statistical data to their political representatives, deeming unnecessary to inform themselves on these issues. On the other hand, if the political process is mistrusted, people want to be kept informed about relevant economic developments, in order to form a better assessment on the political process and its consequences.

**Figure 5 – Trust in official statistics and political decisions made on the basis of them**



**Figure 6 – Importance of knowledge of statistical data**



#### 4. The ISAE Survey

In March and April 2007 surveys ISAE in collaboration with the Statistics Directorate of OECD, has added to its monthly survey on Italian consumers a number of questions on the knowledge of some key statistical figures, together with 3 questions that aim to measure the willingness and desire to be informed and the media used to obtain such information. Moreover, in the period May-September 2007 ISAE has added two specific questions on the “statistical literacy” of Italian consumers, specifically with respect to the inflation process.

##### 4.1 Knowledge of statistical data and willingness/desire to be informed

In this paper, I will focus on the knowledge of official figures for key economic variables such as GDP growth, inflation, unemployment rate and the deficit to GDP ratio<sup>4</sup>. The questionnaire has been submitted to Italian consumers, in the framework of the monthly consumers survey harmonised at the European level by the EU, in March and April, for a total of 4.000 interviews. Questions were generally

<sup>4</sup> In Fullone, Gamba, Giovannini and Malgarini (2007) results concerning the knowledge of socio demographic phenomena are also presented.

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?*

In both March and April's questionnaires, a set 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 (choosing from: TV, newspapers, internet, radio, friends and relatives, political and civic leaders) were also added to the existing list. 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". Table 2 reports the main results; response rates are again on average quite low; it is interesting to note that on average around 30% of the respondents answered questions to inflation and 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.

**Table 2- Response rates on quantitative questions**

	GDP			Inflation			Unemployment	Deficit/ GDP
	March	April	Average	March	April	Average	March	March
Response rate (%)	27.02	19.12	23.07	32.62	23.64	28.13	32.12	12.66
Don't know (%)	70.53	72.83	71.68	65.06	68.76	66.91	65.38	84.46
Refuse to answer (%)	2.45	8.05	5.25	2.32	7.6	4.96	2.5	2.87
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	1.84	3.08	8.66	2.89	6.9	12.99	14.47
<b>True value</b>	<b>1.9*</b>	<b>1.9*</b>		<b>1.8**</b>	<b>1.7***</b>		<b>6.8****</b>	<b>4.4*</b>

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

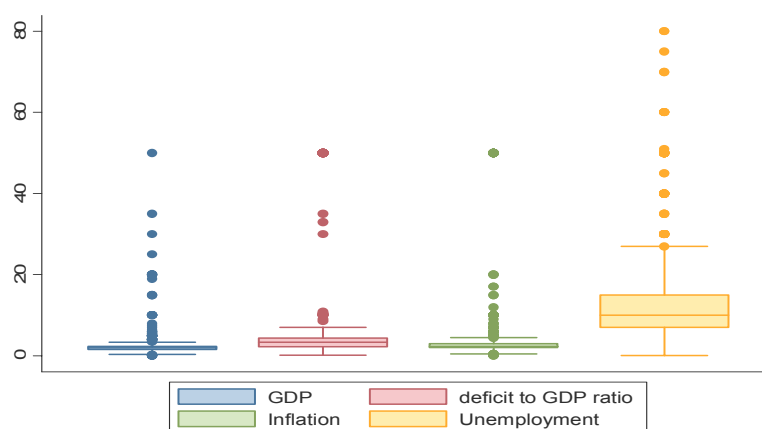
### *Knowledge about the phenomena of interest*

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 unemployment rate and 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 over-estimated 14.5% (official figure 6.8%) and 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<sup>5</sup>: indeed, Italian consumers are shown to have an accurate "median" knowledge of official GDP data since the median is equal to 2 in March (1.9 in 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. 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 overestimate the official figures for the Maastricht parameter accounting for the state of public finances in Italy in 2006.

<sup>5</sup> Similar considerations are also in Curtin (2007).

**Figure 7 – Box plot distribution**

*GDP growth, Inflation, Deficit to GDP ratio, Unemployment*



### *Uncertainty*

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. 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.

### *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 media used to acquire such information. Table 3a 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 States<sup>6</sup> 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.

Table 3b 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%) that – quite surprisingly – precedes radio (18%) as well as conversations with friends and relatives (11%) 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 according to which only the 61% of the sample use it regularly to acquire such information. In the US (Curtin, 2007), the dominant source of information on economic statistics was television, reported by nearly half of all people as their first choice and by nearly

<sup>6</sup> See Blinder and Krueger, 2004.

three-in-four people among their top three choices. Newspapers came in second, with nearly one-in-five naming them their main source, and nearly six-in-ten reported newspapers among their top three choices. The Internet, radio, and personal contacts were each reported by about one-in-three people as among their top three choices. Nearly one-in-ten people volunteered that they never obtain information about the economic statistics.

It is difficult to determine the quality of the information people gain from these sources. Television encompasses a wide variety of reports on economic news, ranging from the in depth details of cable business channels to passing references that contain no details except a one-word summary that the news was “good” or “bad.” The same can be said for newspapers, ranging from the detailed commentary included in specialistic papers like the Wall Street Journal in the US or Il Sole 24 Ore in Italy to the same one-word summaries of the latest rates included in many city or local newspapers. Of all the sources, only the Internet includes the possibility of a direct link to the official government agencies that produce the statistics, but it also includes access to the widest range of sites that can be expected to widely differ in terms of accuracy and quality. The key issue is whether people who rely on any of these sources are more likely to report accurate information on the economic statistics in question; the econometric exercise presented in section 5 below will provide evidence also on this issue. .

**Table 3a- 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
<b>Would you like to be more informed on these issues?</b>	
Yes	54.84
No	40.44
Don't Know/ Refuse to Answer	4.72

**Table 3b- 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

#### 4.2 Knowledge of inflation phenomena

According to specific quantitative questions introduced since February 2003 in the ISAE survey, Italian consumers perceive and expect a much higher inflation rate than that officially measured by ISTAT: on average, in the period considered inflation assessments were as high as 24%, whilst expectations were at 6,6%. These quite striking results may be considered as a first example of possible negative consequences stemming from an inadequate knowledge of statistical data: it is indeed possible that in formulating inflation perceptions Italian consumers, lacking a proper comprehension of the basic data, have been influenced by more general considerations on disposable income or on the personal and general situation of the household and the country<sup>7</sup>. In fact, consumers may be simply unaware of official statistics provided by ISTAT, or they may have problems in correcting remembering past prices<sup>8</sup>, or ignore the exact meaning of the “consumer price” concept as measured by official statistical agencies. Moreover, it is even possible that they may

<sup>7</sup> See Linden (2006); Malgarini (2007); Del Giovane, Fabiani, Sabbatini (2007).

<sup>8</sup> See Gaiotti and Lippi (2004) with reference to price of restaurants and Del Giovane, Rossi Arnaud (2007) for the memory of cinema prices before the change over.

experience problems with the basic statistical concept of “inflation”, intended as the percentage variation of the price of some basket of goods with respect to 12 months before. For instance, in the case of Italy it is possible that consumers have included in their calculation only prices of goods and services they buy frequently (so called “out-of-the-pocket” inflation): for these products, inflation has indeed been higher than average in Italy in the period considered, contributing to partly explain the observed gap (see on this Del Giovane and Sabbatini, 2006).

In order to reach a deeper understanding of these issues, ISAE has run two extra questions, respectively asking the consumers their interpretation of the concepts of “consumer prices” and “price stability”. The questions are the following:

1. *In your evaluation of consumers prices in the last and for the next 12 months, you have considered the prices of:*
  - a. *Only the products of daily use, such as food, transportation, leisure expenditures, house bills*
  - b. *Also the products acquired on a seasonal basis (clothes, travel)*
  - c. *Also the products acquired on a irregular basis, such as cars, durables*
2. *(Only to those having answered that inflation “has been/will be stable”, i.e. answers 5.4 and 6.4 above) So, in your opinion consumer prices have (will) in the last (next) 12 months:*
  - a. *Been (will be) on the same level as now*
  - b. *Risen (will rise) at the same pace as now*

The questions have been administered in the period May-August 2007, on a comprehensive sample of 8.000 Italian consumers; results are reported in table 4, together with those concerning the knowledge of the actual statistic published by ISTAT. Only 28% of Italian consumers are able to provide an estimate concerning the most recent data, 67% and 5% of them being respectively unable or overtly refusing to reply. Moreover, those that are able to reply are capable of providing a reasonably good estimation of official statistical data, with a median estimation of the inflation rate equal to 2.2%. However, the mean of the distribution is higher (3.8%), confirming that the median is a better estimator than the mean, due to a left-skewness of answers distribution (see also Curtin, 2005). Interestingly, in the same months the median inflation perception (both retrospective and in terms of forecasts) is much higher than the official data.

Italian consumers also appear to be not fully aware of the exact definition of inflation: almost  $\frac{3}{4}$  of them think that the basket of goods considered for the calculation does not include durables, and another 23.9% does not even consider “seasonal” purchases, basing their opinions solely on the evolution of prices for “out-of-the pocket” goods, i.e. those acquired on a daily basis (a residual 3.7% of the population is not able to provide an answer to that question). Finally, consumers also show a degree of basic statistical illiteracy, with almost 20% of those having answered that prices “stay (or will stay) about the same” actually considering that they “have risen (or will rise) at the same pace as now”, i.e. considering a concept of inflation stability rather than of price stability.

**Table 4 – Statistical Knowledge on inflation**

Q1: Knowledge of official statistics on inflation						
Knowledge						
True value (March-April)	Response rate (%)	Survey Average	Standard deviation	Median	P25	P75
1.8-1.7	29.3	3.8	6.9	2.2	2.0	3.0
Opinions						
Inflation perceptions						
Response rate (%)	Survey Average	Standard deviation	Median	P25	P75	
66.7	14.3	19.8	6	0	20	
Inflation expectations						
67.3	5.3	12.3	0	0	5	
Q2. Knowledge of “consumer price” concept						
Only products of daily use		Also products acquired on a seasonal basis		Also durable goods		
47.9%		23.9%		24.5%		
Q3. Knowledge of the “price variation” concept (only to those having answered that inflation is/will be the same to the qualitative survey question)						
Price perceptions			Price expectations			
Have been the same as now	Have risen the same as now	Will be the same has now	Will rise the same as now			
82%	18%	82.1	17.9			

### 5. An Econometric model of knowledge

Section 4 has introduced a description of ISAE survey results, providing some first interesting insights on the quantitative and qualitative level of knowledge of Italian consumers about important variables such as GDP, inflation and the unemployment rate. 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 used 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.

#### *The Knowledge score*

The intuition behind the construction of the 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 March, namely those on GDP growth rate, inflation, deficit to GDP ratio, 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 which are 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 Rank<sup>9</sup> 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

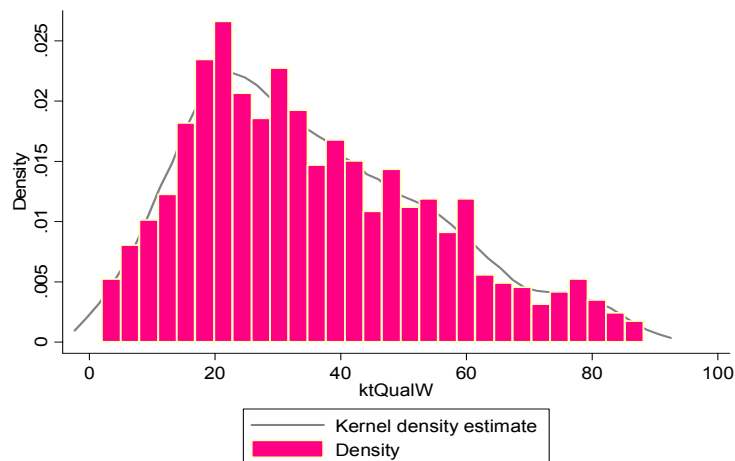
<sup>9</sup> The mathematical formula for the percentile rank (PCTRank) is the following:

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 sample bias<sup>10</sup> 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.

The Knowledge Score is built on March data, including quantitative questions on GDP, Inflation, Deficit to 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 (2.7 versus 1.9). 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 to 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 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. 8). 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 8 - Distribution of aggregated knowledge scores – Kernel Density Estimate superimposed**

*GDP growth, Inflation, Unemployment, GDP ratio, Euro/Dollar*  
 March 2007- 961 observations



**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:

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

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).

<sup>10</sup> 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.

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

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 anymore 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. As a result, the OLS regression is able to explain more than 26% of the total variability of the knowledge score.

**Table 5 – OLS regression for Economic Knowledge Score (K)**

Variables	K-Score (GDP, Inflation, Unemployment, Deficit/GDP) March Survey		
	COEFFICIENT	STD.DEV	T-STAT
Constant term	29.94	3.37	8.88 ***
<i>Socio-demographic controls</i>			
<u>Professional category</u> (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 ***
<u>Age</u> (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
<u>Gender</u> (baseline: Male)			
Female	-12.08	1.12	-10.75 ***
<u>Zone of residence</u> (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 ***
<u>Education</u> (baseline: primary school)			
High School or less	5.05	1.27	3.99 ***
University degree	8.72	1.89	4.62 ***
<u>Income</u> (baseline: 1st 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>			
<u>Importance of being informed</u> (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 ***
<u>Desire to be more informed?</u> (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
<i>Number of available observations: 961</i>			
<i>R<sup>2</sup>=0.26</i>			

Statistically Significance \* = 10% \*\* = 5% \*\*\* = 1%

## 5 Towards an International Survey on Knowledge of Statistical Data

Some first interesting result has emerged from the analysis of two survey on the knowledge of key economic data carried out during 2007 by Eurobarometer and ISAE: European and Italian consumers have shown a low level of knowledge of economic data, with a complex interaction between trust put in official statistical agencies, opinion on the political process and the willingness to be informed on economic data. Similar results have also been found by Curtin (2007) in a companion survey on American consumers.

Moreover, knowledge has resulted to be significantly influenced by socio demographic characteristics of the respondents, with people attributing lower importance to being informed being also those scoring worst results. Finally, people reading newspapers and using the Internet show a better knowledge of key economic data with respect with consumers relying mostly on other sources.

These results seem to point to some form of “irrationality” of consumers, being incapable of acquiring relevant statistical information freely available on the media. However, Curtin (2007) has recently proposed an alternative explanation, based on the concept of “rational inattention”: information is indeed available at a low cost, but on the other hand it is also possible that it has a low return for the consumers in terms of informative content. In this sense, consumers may attribute low value to information that is available at a fairly too aggregate and “static” level, and that is deemed unable to correctly represent a fast-changing and highly heterogeneous world<sup>11</sup>.

In this sense, the results contribute to stress the importance of developing new measurement of societal progress, along the lines suggested in the OECD Global Project on Measuring and Fostering the progress of societies. In the near future, an important step in this direction may be that of extending the survey on statistical knowledge at the international level, having the goal of measuring:

- The public level of trust in official statistics; the possibility of providing a comparison of the level of trust in official statistics with the general level of trust in societies may also be explored, possibly using survey questions similar to those proposed in the World Values Survey
- The public appraisalment on the political process, particularly regarding the role statistic information plays in shaping political decisions
- The public desire/willingness of being informed on statistical issues
- The media used to acquire statistical information
- The knowledge of statistical data:
  - Economic data, explored trough quantitative questions
  - Socio-demographic data, explored trough multiple-response questions
- The knowledge of statistical metadata, such as:
  - Goods and services comprised in the calculation of inflation
  - Meaning of the GDP concept
  - Calculation of the unemployment rate
  - ..... What else?...

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<sup>11</sup> See on this Van Tuinen (2007).

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