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What's behind "inflation perceptions"?  
A survey-based analysis of Italian consumers

by Paolo Del Giovane, Silvia Fabiani and Roberto Sabbatini

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# WHAT'S BEHIND “INFLATION PERCEPTIONS”? A SURVEY-BASED ANALYSIS OF ITALIAN CONSUMERS

by Paolo Del Giovane<sup>\*</sup>, Silvia Fabiani<sup>\*</sup> and Roberto Sabbatini<sup>\*</sup>

## Abstract

This study investigates inflation perceptions in both qualitative and quantitative terms and their relationship with factors likely to affect them. This has been done in a unified framework through a survey of a representative sample of Italian consumers carried out at the end of 2006. The results show that reported inflation is, on average, much higher than measured by official statistics. Inflation perceptions are higher for women, the unemployed and less educated individuals, as well as for consumers with some forms of financial distress. A very low knowledge of the inflation concept and related statistics and an inaccurate memory of past prices turn out to play a significant role in explaining the highest class of perceptions. In contrast, the characteristics of individual shopping activity do not result to be significant. All in all, these results suggest that when consumers express their opinions on what they report as “inflation”, they are incorporating a complex combination of forces that go well beyond the phenomena measured by official inflation statistics.

**JEL Classification:** D12, E31.

**Keywords:** inflation, consumers, perceptions, euro.

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## 1 Introduction<sup>1</sup>

The issue of “perceived inflation”, i.e. consumers’ personal assessment of price increases, received only limited attention from European economists and public opinion until a few years ago, though regularly measured through opinion surveys by the European Commission (EC) and national research institutes (in Italy by the Institute for Economic Research and Analysis, ISAE). It was only in 2002 that consumers’ perceptions began to be regularly commented upon both in the financial and wider general press. The reason for this sudden popularity lies in the widespread belief that the introduction of the euro banknotes and coins determined a much larger rise in prices than recorded by official statistics. This conviction was reflected in the gap between perceived and measured inflation observed – in the euro area and in particular in Italy – since the cash changeover.<sup>2</sup>

In Italy, although according to the qualitative indicator based on the EC-ISAE survey the above gap has narrowed since 2004, there is still a pervasive conviction among consumers that current prices of many products are, if not twice as high, anyway much higher than they were before the introduction of the euro.<sup>3</sup> The issue has a relevance that goes beyond the specific case of the changeover: as shown in this paper, consumers interviewed at the end of 2006 reported an average inflation of 18%, as compared to an official rate (measured by the National Statistical Institute, ISTAT) of around 2%. Although the treatment of specific items in the official index is open to improvement and the possibility of flaws in data collection procedures cannot be excluded, a divergence of such a magnitude is unlikely to be attributable to the methods used by ISTAT or to their implementation. Moreover, these extremely high evaluations are difficult to reconcile with individual behaviour; there is no evidence, in fact, indicating that consumers have adjusted their financial investment strategies or consumption behaviour consistent with an inflation rate of the order reported above. This suggests that what is commonly labelled as “perceived inflation” might capture something more than, and possibly not related to, simply price movements.

In the attempt to provide a comprehensive account of what is behind individual inflation perceptions, this paper relies on a specifically designed survey we carried out in December 2006 on a representative sample of about 1,000 Italian consumers. The survey collects information on the inflation rate perceived by respondents and gathers evidence at the individual level on the various factors that, according to the literature, may affect it. In particular, it considers features such as socio-demographic conditions, knowledge and understanding of the inflation phenomenon and the related statistics, cognitive abilities, financial situation, consumption and expenditure habits.

The paper provides an original contribution in several aspects. First, it is based on a unified framework in which factors deemed as potentially relevant in the formation of perceptions are explored. Second, it goes beyond the specific case of the changeover, as the role of these factors is assessed independently of that event. Finally, it also provides some evidence regarding consumers’ quantitative evaluations of inflation.

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<sup>2</sup> According to available empirical evidence the cash changeover significantly affected price list revisions, leading to exceptional price increases in some sectors, but on average had only a moderate impact; see European Central Bank (2003a,b; 2007) on the euro area, Del Giovane, Lippi and Sabbatini (2005) for the case of Italy, and Del Giovane and Sabbatini (2008) for a survey of the analyses on individual countries.

<sup>3</sup> The relevance of the issue, in Italy as well as in other countries of the euro area, is confirmed by the attention it still receives both by central banks (see European Central Bank, 2007) and by the media (see for example “Euro, i cinque anni che cambiarono l’Italia”, *Corriere della Sera*, 18 December 2006, “Pourquoi les ménages ne s’en sortent plus ... cinq raisons qui explique la grogne des Français”, *L’Express*, December 2006; “Euro squeeze: despite strong growth and low inflation in the euro zone, people feel worse off than ever”, *Time* 26 February 2007). The attention to this issue is not confined to the euro area, as indicated by the analyses carried out by the U.K. statistical institute (see O’Donoghue, 2007, and Powell and O’Donoghue, 2007).

Previous studies have mostly relied upon a partial approach that prevents an overall assessment of the relative importance of the various explanations. Furthermore, some of them are based on hypotheses concerning the psychological processes driving individual beliefs that, though plausible, are not empirically tested. This is partly a consequence of the fact that the main source of information on perceived inflation, and the only official one, is the above mentioned survey coordinated by the European Commission, that is not specifically designed to investigate this phenomenon in depth. In particular, the EC survey does not collect information on important aspects that may underlie perceptions, such as the impact of frequent purchases, the degree of understanding of inflation statistics, the accuracy of price recall and consumption habits. Moreover, questions on the individual quantitative assessment of price changes have been included in the EC survey only since 2003, on an experimental basis and with micro-data not yet made public (Lindén, 2006, and Malgarini, 2007).<sup>4</sup>

The paper is organised as follows. Section 2 describes the main features of the survey. Section 3 illustrates the main findings concerning individuals' inflation perceptions. Section 4 presents the empirical evidence on the relationships between these perceptions and various explanatory factors. Section 5 concludes.

## 2 The survey

Our survey was outsourced to a private company (IPSOS) on the basis of a questionnaire prepared by the authors, which was submitted in December 2006 to a representative sample of around 1,000 households (see Appendix A for the methodological details and Appendix B for the complete questionnaire). It collects information on perceived inflation, both in qualitative and in quantitative terms, over the year preceding the survey (i.e. the 12 months ending in December 2006). In detail, respondents were requested to indicate, as in the EC-ISAIE survey, whether in their view in the past 12 months consumer prices had “fallen”, “stayed about the same”, “risen slightly”, “risen moderately”, or “risen a lot”; they were then asked to report their corresponding quantitative assessment, in percentage terms. The questionnaire also asked respondents to indicate, in quantitative terms, the average price change over the last 12 months for the items they have actually bought and, among them, for food products only. These two questions were added in order to collect empirical evidence on a possibility that has been considered in the literature, namely that individuals' perceptions may refer to the inflation rate they actually experience personally, rather than to the overall price dynamics, for two main reasons (see, for instance, Jonung, 1981, and Guiso, 2003). First, for each consumer the pattern of price changes for the items actually purchased could differ from that of the index. For example, the evolution of the prices of essential goods (e.g. food), that predominate in the expenditure bundle of the less well-off households, could differ from that of non-essential ones (e.g. electronic goods) that have a higher weight in the expenditure of wealthy households. Second, consumers are likely to pay more attention to the price developments of the items they actually purchase.<sup>5</sup>

The various potential factors underlying individual perceptions are grouped into five broad classes, each covered in specific parts of the questionnaire:<sup>6</sup> (i) socio-demographic features (part E);

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<sup>4</sup> Two questions (on past and expected price changes) were added in the national questionnaires on a voluntary basis. Almost all institutes carrying out the consumer surveys have included them, in some countries already in January 2003 (February in the case of Italy), at a later stage in other countries. The question on past inflation is formulated as follows: “By what percentage do you think consumer prices have gone up/down over the past 12 months?”.

<sup>5</sup> Respondents were also asked to report their quantitative assessment of overall price developments over the five years elapsed since the euro cash changeover, as this was a particularly relevant period for the evolution of inflation perceptions. In this case, they could choose their answer from a pre-defined grid, ranging from “less than 15%” to “more than 70%”.

<sup>6</sup> The sequence of questions was decided so as to minimise the risk that the answers to each question could be influenced by the previous ones, as well as the risk that by addressing specific issues at the beginning of the survey (e.g. the questions on

(ii) the degree of knowledge and understanding of the inflation phenomenon (part D); (iii) cognitive mechanisms deemed to be relevant for the formation of perceptions, such as the ability to recall the price of a specific product and the awareness of price reductions (part A); (iv) the household's economic situation (part B); (v) consumer behaviour, captured by a variety of aspects concerning consumption and expenditure habits (part C). The main aspects within each class and the arguments put forward in the literature to support their role in the formation of perceptions are reported below.

*Demographic and social characteristics.* Although high perceived inflation is a widespread phenomenon, results found in the literature (see in particular Bryan and Cecchetti, 2000, and Bryan and Venkatu, 2001a and 2001b, for the United States, and Jonung, 1981, for Sweden) support the hypothesis that there exist significant differences depending on the individuals' socio-demographic features. In particular, women tend to report higher inflation than men, also controlling for the items purchased; perceptions also appear to be related to the individual's working condition and professional category. In order to capture the relevance of these relationships our survey collects information on the respondents' gender, age, education, working status and professional category.

*Understanding inflation and inflation statistics.* An analysis of consumers' ability to understand and interpret correctly inflation statistics is important per se, as economic theory generally assumes that economic policy decisions are taken as solutions to optimization problems solved by rational and well-informed agents (Blinder and Krueger, 2004). But the issue has also a specific relevance in our study, since individual inflation perceptions might reflect misinterpretation of the information provided by price statistics, a possibility never thus far explored in the literature on this subject. In our survey this phenomenon is investigated in several facets (see Appendix B); in particular, we assess whether consumers (i) misunderstand price changes as price levels, (ii) are able to compute correctly percentage changes, (iii) are aware of the composition of the CPI basket, in particular (iv) are aware that house prices are not included in it. To summarise the information provided by the answers to these questions, we have computed a synthetic indicator of "inflation knowledge", that takes values 0 to 4 according to the number of correct answers given by each respondent.

*Psychological factors and memory.* In the literature it has been argued that three types of psychological mechanisms may have a relevant role in the formation of inflation perceptions: (i) the disproportionate effect of frequent purchases; (ii) the asymmetric recognition of price increases and decreases; (iii) an inaccurate recall of past prices.

The role played by frequency of purchase in the post-changeover period has been investigated by the European Central Bank (2003a, 2003b, 2007) and Aucremanne, Collin and Stragier (2007) for the euro area as a whole, by ISAE (2002) and Del Giovane and Sabbatini (2006) for Italy and by a number of papers for other countries.<sup>7</sup> With few exceptions, these studies conclude that the combination of the higher weight of these purchases in individual inflation perceptions with the fact that they recorded bigger price rises in the post-changeover period contributed to the rise in inflation perceptions.

Del Giovane and Sabbatini (2006) also notice that whereas official consumer price indices are calculated by weighting the individual items according to their shares in total household consumption, individual perceptions may be more responsive to upward price movements than to downward ones. In a period characterised by many changes in relative prices – which they show to

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knowledge and understanding of inflation statistics) we could annoy the respondents and affect negatively their willingness to complete the questionnaire.

<sup>7</sup> See De Nederlandsche Bank (2002), Santos et al. (2002), Walschots (2002), Banco de España (2003), Buiten (2003), INSEE (2003), Álvarez González et al. (2004), Crédit Agricole (2004), Fluch and Stix (2005), Aalto-Setälä (2006), Kurri (2006); for a survey of these studies, see Del Giovane and Sabbatini (2008). Psychological research by Marques and Dehaene (2004) examines the mechanisms through which individuals form their estimates of prices and the possible relation between frequency of purchase and rapidity of the learning process, and confirm the hypothesis that learning is faster for frequently consumed goods; on the importance of this aspect, see also Guiso (2003), Mastrobuoni (2004), Brachinger (2006) and Ehrmann (2006).

be the case for Italy following the changeover – this may have appreciably influenced individual assessments of inflation.<sup>8</sup> The assumption that consumers' inflation perceptions are asymmetric plays a relevant role also in Brachinger's (2006) index of perceived inflation for Germany.

Finally, Gaiotti and Lippi (2004) and Del Giovane and Sabbatini (2006) suggest that individual perceptions of high inflation, in particular in the post-changeover period, may also be related to an inaccurate memory of past prices and a difficulty in distinguishing the period of time over which prices have changed. For instance, in the case of durable goods, which are purchased rarely, it is most likely that consumers mentally refer to their last purchase without recalling precisely when it took place. For goods and services bought more frequently, the price recall might refer not to a single price but to a number of prices observed over a more or less extended span of time. Evidence on the accuracy of consumers' memory of prices is provided by Cestari, Del Giovane and Rossi-Arnaud (2007), whose results – on Italian movie-goers' recall of pre-euro cinema prices – suggest that what people remember can be highly distorted.

Following the hypotheses and evidence provided by the studies above, our survey examines the role of the frequency of purchase, the asymmetric perception of price movements and the accuracy of price recall.<sup>9</sup>

To test whether individuals' inflation perceptions reflect the composition of their personal consumption basket, in particular in relation to frequency of purchase, respondents were asked to indicate which products they typically buy. Possible answers to this question included three categories – food, durable goods (cars and electronic goods) and restaurant services – that are representative of alternative purchasing frequencies and whose relative prices have recorded significant changes in the recent years.

The accuracy of memory of past prices was assessed by asking respondents to indicate the price of a newspaper at the time of the survey, one year earlier, and in 2001.<sup>10</sup> We focused on newspapers' price because it can be reconstructed precisely for the past, is homogeneous over the national territory, and it is less subject to differences (due to quality or brand) than the price of many other products; furthermore it is an item that one can expect to be purchased, at least occasionally, by a relatively high percentage of consumers. The price in 2001 was asked for as it provides a particularly relevant test of memory for prices, given that the debate about inflation in Italy, even years after the changeover, turns around what consumers claim to be a precise recall of pre-euro prices. Respondents were also asked to indicate the official rate at which lira prices were converted into euro. The answers to this question provide a further test of consumers' memory, and an indication of the possibility that incorrect recall of the conversion rate affects their inflation perceptions.

*Economic conditions.* Consumers may find it difficult to distinguish the loss of purchasing power caused by inflation from a more general impoverishment due to other causes; since the latter varies across households with different characteristics, this could also explain the heterogeneity in perceived inflation across groups of individuals.

According to the last two editions of the Bank of Italy's *Survey of Household Income and*

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<sup>8</sup> Relevant examples of the heuristics employed in subjective assessments and asymmetry in subjective evaluation are provided by Tversky and Kahneman (1974) and Kahneman and Tversky (1979).

<sup>9</sup> Research in experimental psychology also indicates that inflation perceptions may reflect individuals' expectations. In the case of the changeover to the euro, Traut-Mattausch et al. (2004) have found that the more pessimistic the individuals' expectations, the more they tended to overestimate the changeover's inflationary effects. The relevance of this aspect is probably larger for the specific case of the changeover than in general and – given the relatively long period between the euro cash changeover and the time of the study and the difficulty of measuring past expectations through retrospective questions – we decided not to address this specific factor in our survey.

<sup>10</sup> Since on some days of the week the most widely read Italian newspapers are sold together with a supplement, respondents were asked about the price excluding supplements.

*Wealth* (SHIW; Banca d'Italia, 2004, 2006), the growth in households' annual disposable income between 2000 and 2004 was on average modest and varied considerably according to the work status of the head of the household, while there is no evidence of significant differences in inflation rates across the various categories over the same period (ISTAT, 2007). In particular, the income of households headed by self-employed workers increased much more than that of households headed by payroll employees. Boeri and Brandolini (2004) show that differences in the trends of household income in recent years have affected the incidence of relative poverty – the percentage of low-income households among self-employed workers has diminished but it has increased among production and clerical workers – although the indicators for the population as a whole have remained broadly stable.

Our survey collects several indicators aimed at capturing this aspect. First, mirroring the Bank of Italy's SHIW, respondents are asked whether the household's monthly income allows some savings, is just enough to finance current expenditures, or has to be complemented with drawings from existing savings or debts. Second, they are asked whether they pay a rent, and in this case what fraction of the household's monthly income is absorbed by it. This is a particularly relevant issue, since rent is a major expense for tenants but has no impact on the monthly expenditure of home-owners. In Italy, where only around 20% of households live in rented accommodation, this item has a relatively low weight in the CPI basket (3.1%), implying a substantial difference with respect to the personal expenditure basket of anyone who pays rent. Third, respondents were asked whether they had been actively engaged, over the last five years, in the process of selling or purchasing a dwelling, independently of the actual realisation of the transaction. This question is based on the idea that consumers' economic conditions and inflation perceptions over the last few years may have been affected by the sharp rise in house prices, despite the fact that such prices are not included in the CPI basket.<sup>11</sup> On the other hand, it has been argued (Lindén, 2006) that when consumers are involved in an important transaction, such as buying or selling a dwelling, they have strong incentives to collect and process a significant amount of information – in particular on interest rates and future inflation, given that they have to borrow money to finance the purchase – and, accordingly, are likely to be more aware of price developments than those who are not involved in a similar activity. Finally, respondents are required to indicate the number of the household's components and how many of them have earned an income over the previous six months. On the basis of this information we compute the number of income earners per household component; in principle, we would expect that the closer this ratio is to one, the less the budget constraints and the lower perceived inflation.

*Consumer behaviour.* Consumers can gather direct information on prices through their shopping activity. In this light, individuals with more “sophisticated” practices and habits should in principle be more capable than others in drawing a complete and correct picture of price changes, in particular of movements in relative prices across goods and/or retailers, and therefore should have inflation perceptions more in line with official measurements.

Consumer behaviour is analysed by focusing on two types of products that can be regarded as representative of more general categories of goods: food and durable goods. The former is an example of products for which consumers are likely to have very wide and updated information on price developments due to the high frequency of purchase and the variety of retailers that sell these products, thus making it easier to compare prices and detect relative price movements. Durable goods are an example of products purchased at a low frequency, characterised by a downward price trend over time due to technical progress, and by relatively high price levels that should encourage search activity before deciding where to buy them.

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<sup>11</sup> In Italy, according to data provided by *Il consulente immobiliare*, house prices rose by around 60% between the end of 2001 and 2006. As mentioned above, in another part of the questionnaire respondents are also asked to indicate whether, to their knowledge, the statistical institute includes house prices in the computation of inflation.

With reference to food products, respondents were asked to indicate the type of retailer where they carry out this type of purchase, whether they have changed retailer in the last year as a reaction to an excessive price increase, and, if they have not changed it, the reasons underlying their “loyalty”. Concerning durable goods, they are asked whether during the previous 5 years they have purchased a TV, house electronic appliances, a personal computer, or a mobile phone; if yes, how many merchants they had visited before buying the product. Finally, in the same section of the questionnaire we also address two further aspects that may capture the degree of “sophistication” of individual consumption and shopping practices: the use of the internet to get information on the product characteristics and, possibly, to buy goods and services; the possession and frequency of use of cash or credit card.

### 3 Inflation perceptions

Prices have “risen a lot” in 2006, the year preceding the survey, according to one-fourth of the respondents, and have either “remained the same” or “risen slightly” for about the same percentage (Table 1); the remaining half of the sample indicated a “moderate rise” and very few (less than 1%) reported that prices “have fallen”.<sup>12</sup> For the sake of simplicity, Table 1 also presents the results collapsing the first three options (fallen, remained about the same, risen slightly) into a unique category and denominating the resulting classes of perceived inflation as “low”, “moderate” and “high” (the same procedure is followed in the Tables reporting descriptive statistics in Appendix C).

**Table 1 - Inflation perceptions (1)**  
(observations and percentages)

Qualitative	Frequency				Quantitative			
	Five classes		Three classes		Mean	Median	Mean	Median
	Frequency	%	Frequency	%				
Prices have:								
fallen	5	0.6	} 229	28.1	-6.2	-10.0	} 3.4	0.0
stayed about the same	113	13.9			0.0	0.0		
risen slightly	111	13.6			8.4	5.0		
risen moderately	377	46.3	377	46.3	21.9	20.0	21.9	20.0
risen a lot	208	25.6	208	25.6	36.2	30.0	36.2	30.0
Total	814	100.0	814	100.0	17.7	10.0	17.7	10.0

Notes: (1) Based on answers to questions A.1 and A.1b (see Appendix B).

The quantitative assessment corresponding to this qualitative evaluation is, on average, very far from measured inflation:<sup>13</sup> 17.7%, compared to an official figure of 1.9% – computed as the 12-month growth of the CPI over the same period.<sup>14</sup> The gap is also wide if one considers the median of the responses (10%), not affected by outliers. Moreover, quantitative perceptions are very high not only for individuals belonging to the category “risen a lot”, who report an average growth of

<sup>12</sup> This result is in line with the evidence provided by the ISAE survey conducted in the same month, according to which 44% of respondents reported that prices had “stayed about the same” or “risen slightly”, while 38% and 17% of them, respectively, indicated that prices had risen “moderately” and “a lot”.

<sup>13</sup> The correlation coefficient between qualitative and quantitative individual perceptions is 0.64.

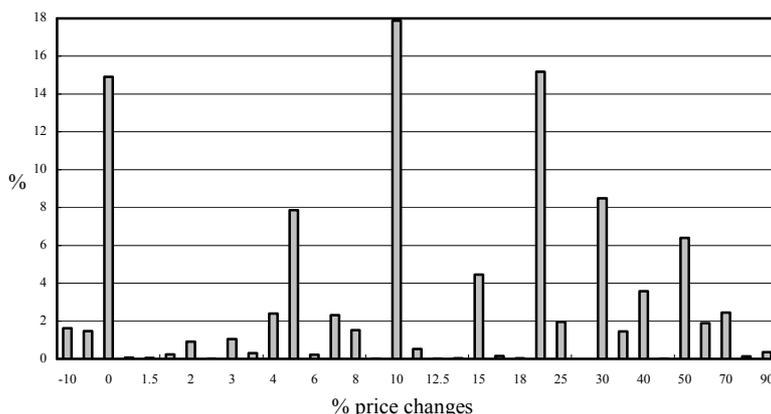
<sup>14</sup> Concerning the perceived growth of prices since the euro cash changeover, the most frequent answer (42% of respondents) was “between 30 and 70%”. A slightly lower percentage of respondents (38%) indicated that prices had risen by “more than 70%”, an answer that is basically in line with the popular belief that prices were converted at a rate of 1,000 lire to 1 euro (rather than at the official rate of almost 2,000 lire), which would imply a 100% price rise. Only 2.5% of the sample answered “less than 15%”, which corresponds approximately to the cumulated inflation measured between the beginning of 2002 and the end of 2006.

36%, but also for those answering “risen moderately” (22%) and “slightly” (8%).<sup>15</sup>

The order of magnitude of the gap is much larger than that found by similar studies for the United States. Bryan and Venkatu (2001a, 2001b), on the basis of the survey conducted by the Federal Reserve Bank of Cleveland and Ohio State University on a sample of Ohio State residents, report that between August 1998 and November 2001 perceived inflation averaged 6%, compared to 2.7% recorded by official statistics.

Figure 1 shows the distribution of the individual quantitative assessments of price changes. Half of them, between the 25 and 75 percentile (an indication of the variance), range between 5 and 25%. The mode of the distribution is 10%. Other features of the distribution are quite striking. First, the answers tend to cluster on rounded and relatively high figures (similar evidence is in Curtin, 2005). Almost all respondents report an integer value, while only very few (0.6% of the sample) indicate a rate of change with a decimal point. Moreover, most of the individual assessments concentrate at values which are equal to, or multiple of, 5% (72% of respondents).<sup>16</sup> These results compare with an official inflation rate that over the last few years fluctuated only by few decimal points, around values just above 2%, suggesting that the metrics of perceived inflation is fundamentally unrelated to that of the official statistics, as if the two phenomena were of a substantially different nature.

**Figure 1 – Distribution of quantitative perceptions (1)**  
(percentage of respondents on the vertical axis)



Notes: (1) Based on answers to question A.1b (see Appendix B).

There is a generalised reduction in inflation perceptions as the focus narrows from the overall basket to more specific expenditure bundles: the average quantitative perception falls from 17.7% to 15.8% for what we label as “own basket” and to 13.9% for food products only. This reduction mainly reflects the substantial fall in women’s perceptions, to levels in line with those recorded for men, when moving from the general to narrower baskets (see Table 2, and Section 4 for further comments on this issue).

<sup>15</sup> These results are very close to those reported by Malgarini (2007) on the basis of the answers to the experimental question included in the ISAE survey. A comparison with the evidence reported for the whole euro area by Lindén (2006) is less direct, given that the latter refers to a dataset spanning over two and a half years.

<sup>16</sup> The same holds for quantitative perceptions related to the different consumption baskets considered in the survey, namely items actually purchased by the individual (“own basket”) and food products.

**Table 2 - Quantitative inflation perceptions by gender for different baskets**  
(percentages)

Gender	Quantitative perceived inflation					
	Overall prices		Prices of own basket		Prices of food	
	Mean	Median	Mean	Median	Mean	Median
Male	15.2	10	14.8	10	13.5	10
Female	24.1	20	18.6	15	15.0	10
Total	17.7	10	15.8	10	13.9	10

#### 4 Factors behind inflation perceptions: empirical evidence

The relationship between individual perceptions and the factors that may affect them is explored through an econometric multivariate analysis. The analysis is designed to measure the correlations between perceptions and the variables considered, without necessarily attributing a causal link to them; while most factors can be considered to be certainly exogenous with respect to perceptions, for a few of them we cannot exclude a reciprocal link.

As a first exercise, we consider the various degrees of individual perceived inflation expressed in qualitative terms, the most widely used indicator in this literature. Respondents who answered that prices had “fallen” or “stayed about the same” are collapsed into a unique category, given that less than 1% indicated a decrease in prices. We estimate an ordered probit model of the general form:

$$P(y_j = x) = F(b_1 z_{1j} + \dots + b_m z_{mj})$$

where  $F$  is the cumulative function of the normal distribution,  $y_j$  is a variable taking values from 1 to 4 depending on the individual  $j$ 's qualitative perceived inflation (1 = “negligible”; 2 = “low”; 3 = “moderate”; 4 = “high”),  $P(y_j=x)$  denotes the probability that the individual  $j$ 's inflation perceptions are equal to  $x$  ( $x=1, 2, 3, 4$ ), and  $z_{ij}$  represents a set of  $m$  characteristics of the individual  $j$ , which might influence his/her degree of perceived inflation.

As a second exercise, we focus exclusively on the characteristics of the consumers with extreme perceptions, estimating a simple probit model where the variable  $y_j$  is equal to 1 if the respondent  $j$  answered “high” and 0 otherwise. While one may expect consumers to express this opinion in the presence of an exceptional event – the cash changeover being the obvious case, in consideration of both the psychological impact and the anomalous variations it actually induced in the price distribution – it is interesting to examine which factors may drive this belief in a period that presented no exceptional features such as the one in which we carried out the survey.

Finally, as a sensitivity analysis, we conduct a third exercise by carrying out a simple OLS regression on quantitative perceptions, to assess whether the results confirm those obtained on the basis of the qualitative indicator.

In all estimation exercises we consider the same independent variables, corresponding to the factors discussed in section 2. Specifically, the models in their general form include:<sup>17</sup>

- demographic and social characteristics, including gender, age, educational attainment, working condition, professional category;
- a synthetic dummy variable – *knowledge* – which is equal to 1 if the individual provided correct answers to all the questions concerning knowledge and understanding of the inflation

<sup>17</sup> For a detailed list of the variables included in the regressions, see Appendix D.

statistics and 0 otherwise;

- variables describing psychological and memory mechanisms: the type of products the individual typically buys to capture the effect of frequent vs. infrequent purchases (*buy food products* and *buy durable products*), the inclination to notice and bear in mind not only upward but also downward price movements (*awareness of price decreases*), the ability to recall past prices (*newspaper price last year*, *newspaper price 5 years ago*, *lira-euro conversion rate*);
- indicators of the degree of financial distress of the household to which the individual belongs: the ability to meet the monthly expenditure needs without incurring debts or resorting to previous savings (*financial situation*); the ratio between the number of incomes and that of members of the household (*incomes per member*); and, if the respondent pays a rent, its incidence on the overall household's income (*pay a rent*). An additional piece of information considered is whether the individual has been involved in activities related to the sale or purchase of a dwelling;
- indicators identifying the individual's behaviour as customer and consumer: the intensity of search activity among different merchants before purchasing durable goods (*search*), the use of the internet (*internet*) and of electronic means of payments (*cash or credit card*).

Where deemed of particular interest, the econometric results are complemented by simple descriptive evidence, mostly based on the frequency distributions of the individual answers on the various aspects covered in the survey (details of these statistics are provided in Appendix C).

The ordered probit estimates for the first exercise are presented in Table 3 and summarised below for the various groups of explanatory variables following the same order as in section 2.

*Socio-demographic factors.* We find a statistically significant role for gender, education and working condition; in particular, women, less educated individuals and unemployed are more likely to have higher inflation perceptions. These results are consistent with those found for the United States and Sweden (see section 2).

The relationship with gender and schooling also emerges quite strongly from the simple frequency distribution of the responses, with respect to both qualitative and quantitative assessments (Table C.1 in Appendix C). The share of women reporting high perceptions is twice as high as that of men (33% as against 15%); in quantitative terms, average inflation is 24.1% for the former and 15.2% for the latter. Moreover, the share of respondents with high perceptions and the corresponding average quantitative assessment decrease monotonically with the level of educational attainment (at the two extremes, 28% of those having completed only primary or middle school fall in the high inflation category, as compared to 7.4% of those possessing a university degree).

An interesting result is that the difference between women and men disappears when the answer concerns food prices rather than the general price level (see Table 2 in section 3). The finding that the gender effect becomes larger when one moves from a specifically focused question to a more general one suggests that the latter is more likely to reflect factors less directly related to the actual price developments.

The descriptive evidence indicates that qualitative perceptions are also related to the individual's working condition and professional category (the percentage of those reporting high inflation is higher for unemployed, students and housewives, lower for the individuals who, at least in principle, can adjust the price of the goods or services they sell, i.e. entrepreneurs, professionals and retailers); however, no clear correspondence is found between these characteristics and the quantitative assessment.

**Table 3 – Factors underlying qualitative inflation perceptions**  
(ordered probit estimates) (1)

	coefficient	t statistic (2)
knowledge	0.06	0.30
buy food products	0.04	0.14
buy durable products	0.14	0.11
awareness of price decreases	-0.41	-1.48
newspaper price last year	0.09	0.46
newspaper price 5 years ago	0.13	0.63
lira-euro conversion rate	0.07	0.36
financial situation	-0.36	-1.84 **
incomes per member	-0.64	-2.50 *
pay a rent	0.29	0.77
dwelling transaction	0.11	0.54
search	-0.25	-1.18
internet	-0.18	-0.67
cash or credit card	-0.40	-2.76 *
centre	0.08	0.27
islands	0.60	2.17
north-east	0.03	0.10
north-west	0.13	0.52
south	(ref.)	
male	-0.68	-2.97 *
female	(ref.)	
age <30	(ref.)	
age 30-40	-0.43	-0.91
age 40-50	0.20	0.43
age 50-65	0.18	0.40
age > 65	0.35	0.66
primary education	0.36	0.69
low secondary education	0.48	1.88
high secondary education	0.52	2.68
university or more	(ref.)	
permanent employee	-0.71	-1.51
fixed term employee	-0.83	-1.64
independent worker	-0.95	-1.93
unemployed	(ref.)	
retired	-1.24	-2.50
student	0.09	0.21
housewife	-1.55	-2.98
number of observations	817	
equation F (d.o.f.) [prob > F]	3.13 (32, 777)	[0.000]
dummies F (d.o.f.) [prob > F]		
- geographical area	1.50 (4, 805)	[0.199]
- age	1.32 (4, 805)	[0.260]
- education	2.59 (3, 806)	[0.052]
- working conditions	2.19 (6, 803)	[0.042]

(1) Dependent variable: qualitative perceptions, four categories: “fallen-stayed about the same”; “risen slightly”; “risen moderately”; “risen a lot”. (2) P-values in squared brackets; \* significance at 5%; \*\* significance at 10%.

*Knowledge, psychological factors and memory.* The degree of individuals' knowledge of inflation indicators, psychological factors and memory do not appear to be significantly correlated to perceptions within our multivariate exercise.

However, the distribution of individual responses points to some interesting insights. As to knowledge, the results reported in Table C.2 in Appendix C suggest that consumers have a limited ability to assess correctly what inflation statistics actually measure:<sup>18</sup> in particular, (i) more than half of the respondents misunderstand price changes for price levels (they interpret the statement "inflation was 2% in Turin and 3% in Milan" as meaning that the price level, rather than the rate of price increase, was lower in Turin than in Milan); (ii) around one-fourth are unable to compute correctly percentage changes (a price rise from 100 to 150 euros is considered higher in percentage terms than a rise from 10 to 20 euros); (iii) three-quarters of them do not know the broad composition of the price consumption basket (they believe that it refers to a set of essential products or to the products whose price has increased); (iv) more than half wrongly report that house prices are included in the CPI basket.

Regarding psychological factors, an overwhelming majority of the respondents (80%) say that they have observed no price decrease (in any category of product) over the last five years (Table C.3 in Appendix C); this belief appears to be widely held also by those who have bought an electronic good in the same period, and thus would be expected to have experienced some price decreases.<sup>19</sup> Perceptions, both qualitative and quantitative, of the 20% of respondents aware of price decreases are in general much lower than for the rest of the sample, providing some support, albeit of a descriptive nature, to the hypothesis that an asymmetric recognition of price increases and decreases may affect perceived inflation. Moreover, the latter is not higher for those who typically buy food than for the others, contrary to what one might have expected based on the changeover experience. This result is hardly surprising, since in 2006 food prices did not record exceptional increases, by contrast with the developments observed in 2002.

As to price recall (referring to the newspaper price), it is relatively accurate for the current price and the price one year earlier (86 and 70% of the respondents, respectively, indicated the correct price; Table C.4 in Appendix C), while it worsens drastically for the pre-euro price. Only a small percentage (16%) recall it correctly (1,500 lire), while an overwhelming majority (60%) recall a price that is at least one-third lower. Moreover, the most frequently recalled price (1,000 lire) corresponds to the price prevailing at the time of the survey (1 euro) converted at an implicit rate of 1,000 lire to 1 euro.<sup>20</sup> These results are in line with those of Cestari, Del Giovane and Rossi-Arnaud (2007) for pre-euro cinema prices.

*Economic conditions.* A significant role is played by economic conditions. Individuals belonging to households characterised by some forms of financial distress (as captured by the difficulty in meeting monthly expenditure and the number of incomes per family) are more likely to perceive higher inflation.

These findings are confirmed neatly by the corresponding descriptive evidence (Table C.5 in Appendix C): the share of respondents with high perceptions and the corresponding average quantitative assessment decrease monotonically with the degree of well being of the household (at the two extremes, 27% of those having to incur debts or draw on savings to meet monthly

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<sup>18</sup> Further evidence that Italian consumers have a scarce familiarity with economic statistics is provided by Fullone et al. (2007) and Malgarini (2007).

<sup>19</sup> This could be partly due to consumers not taking into account the quality improvement of these items, which is instead incorporated in official statistics.

<sup>20</sup> This is not due to an imprecise knowledge of the official lira-euro conversion rate (1,936.27 lire), since when asked about the latter, the overwhelming majority of respondents indicated the correct conversion rate or a figure close to it (Table C.5 in Appendix C); however we cannot exclude that the respondents recall correctly the official conversion rate but are convinced that the actual conversion took place at a different rate.

expenditures fall within the high inflation category, as compared to 15% of those who are able to save), and with the number of incomes per family (31% for those families in which one out of four members earn an income, as compared to 17% in cases in which each component earns something). Though not significant in the econometric exercise, the same type of relationship also holds with respect to the property of the house occupied by the respondent, with those paying a rent having much higher qualitative perceptions than home-owners. The quantitative assessments also indicate that better-off households have lower perceived inflation.

*Consumer behaviour.* An unexpected result of our estimates is that the set of proxies for consumption and expenditure habits does not significantly affect perceptions, with the exception of the frequent use of cash or credit cards, that turns out to be (negatively) correlated with them. In particular, no significant relationship is found for the use of the internet (either to make purchases or collect information on prices) and for the respondents' search effort in shopping activity (as measured by the synthetic variable *search*); the same holds for the type of products (foods and durables) mostly purchased by the respondents. All in all, this suggests that inflation perceptions are scarcely affected by a more attentive shopping behaviour, which could have been expected to lead to more accurate evaluation of price developments.

The results of the second exercise, where we investigate which factors make it more likely for individuals to have extreme ("high") inflation perceptions, and those of the third one, on quantitative assessments, are reported in Tables 4 and 5. Both confirm the role of socio-demographic and economic factors, although only one proxy of the economic condition is significant in each case.

High qualitative perceptions are also significantly related (though only at 10%) to the synthetic variable capturing the degree of knowledge of inflation and to the accuracy of price recall. In particular, the negative sign of both coefficients indicates that those having a lower degree of knowledge and a worse price recall are also more likely to have high qualitative perceptions. Accuracy of price recall and other psychological factors (awareness of price reductions) play a significant role in the relation to quantitative perceptions.

## 5 Conclusions

This paper examines the relationship between individual inflation perceptions and the various factors that, according to the existing literature, may affect them. This is done in a unified framework through a survey of Italian consumers specifically designed for this purpose, carried out in December 2006.

The empirical analysis is based on a multivariate econometric framework; where particularly interesting, additional descriptive evidence is also provided, with regard to both qualitative and quantitative assessments.

The results indicate that inflation perceptions are significantly related to consumers' socio-demographic characteristics, in particular gender and education, and their economic condition. As to the gender, women report, on average, an inflation rate that is almost twice as high as that indicated by men, a result which has been highlighted as a puzzling regularity in previous literature on the United States. A gap of a similar size is found between individuals educated up to middle school degree and the rest. Such differences are not explained by a different composition of the respective consumption bundles, as they remain even when controlling for the type of purchases carried out by each respondent. Concerning economic conditions, consumers belonging to households characterised by some forms of financial distress – as measured by the need to incur debts or resort to previous savings to meet the monthly expenditure, by the number of incomes in the household, and by the rent burden for those who are tenant – report higher inflation. The results obtained by Malgarini (2007), based on the ISAE survey, are in several respects in line with ours.

**Table 4 – Factors underlying “high” qualitative inflation perceptions**  
(*probit estimates*) (1)

	coefficient	t statistic (2)
knowledge	-0.44	-1.85 **
buy food products	-0.09	-0.26
buy durable products	0.12	1.10
awareness of price decreases	-0.29	-0.81
newspaper price last year	0.11	0.50
newspaper price 5 years ago	0.39	1.71 **
lira-euro conversion rate	-0.16	-0.66
financial situation	-0.09	-0.35
incomes per member	-0.05	-0.17
pay a rent	0.60	1.80 **
dwelling transaction	0.09	0.37
Search	0.05	0.23
Internet	-0.13	-0.43
cash or credit card	-0.23	-1.57
Centre	0.09	0.26
Islands	0.66	1.70
north-east	0.58	1.77
north-west	0.16	0.55
South	(ref.)	
Male	-1.03	-4.04 *
female	(ref.)	
age <30	(ref.)	
age 30-40	0.63	1.21
age 40-50	1.12	2.17
age 50-65	0.64	1.23
age > 65	0.54	0.93
primary education	1.33	2.42
low secondary education	0.92	2.71
high secondary education	0.84	2.89
university or more	(ref.)	
permanent employee	-0.59	-1.14
fixed-term employee	-0.91	-1.49
independent worker	-1.34	-2.29
unemployed	(ref.)	
retired	-1.75	-3.10
student	0.43	0.65
housewife	-1.27	-2.25
number of observations	817	
equation F (d.o.f.) [prob > F]	3.51 (32, 777)	[0.000]
dummies F (d.o.f.) [prob > F]		
- geographical area	1.34 (4, 805)	[0.253]
- age	1.48 (4, 805)	[0.207]
- education	3.32 (3, 806)	[0.019]
- working conditions	3.45 (6, 803)	[0.002]

(1) Dependent variable: qualitative perceptions, two categories: “high” (answer “risen a lot”) and “other” (answers “fallen”, “stayed about the same”, “risen slightly”, “risen moderately”). (2) P-values in squared brackets; \* significance at 5%; \*\* significance at 10%.\*

**Table 5 – Factors underlying quantitative inflation perceptions**  
(OLS estimates) (1)

	coefficient	t statistic (2)	
knowledge	-1.33	-0.61	
buy food products	2.83	0.76	
buy durable products	1.94	1.37	
awareness of price decreases	-6.06	-2.02	*
newspaper price last year	-0.58	-0.25	
newspaper price 5 years ago	5.49	2.02	*
lira-euro conversion rate	6.26	2.05	*
financial situation	-1.93	-0.63	
incomes per member	-6.76	-2.74	*
pay a rent	5.67	1.01	
dwelling transaction	-2.40	-1.02	
search	-0.59	-0.25	
internet	-0.15	-0.05	
cash or credit card	-3.20	-1.78	
centre	-7.35	-1.98	
islands	-3.93	-0.84	
north-east	-9.12	-2.19	
north-west	-7.54	-1.82	
south	(ref.)		
male	-7.42	-2.19	*
female	(ref.)		
age <30	(ref.)		
age 30-40	-6.37	-1.14	
age 40-50	-3.85	-0.65	
age 50-65	-7.12	-1.24	
age > 65	-3.85	-0.52	
primary education	4.39	0.69	
low secondary education	9.23	2.36	
high secondary education	6.11	2.47	
university or more	(ref.)		
permanent employee	5.53	1.08	
fixed-term employee	0.24	0.04	
independent worker	4.16	0.78	
unemployed	(ref.)		
retired	7.68	1.21	
student	1.86	0.16	
housewife	0.40	0.07	
number of observations	707		
equation F (d.o.f.) [prob > F]	4.71 (32, 677)	[0.000]	
dummies F (d.o.f.) [prob > F]			
- geographical area	1.69 (4, 695)	[0.151]	
- age	0.64 (4, 695)	[0.636]	
- education	2.94 (3, 696)	[0.032]	
- working conditions	0.41 (6, 693)	[0.871]	

(1) Dependent variable: quantitative perceptions (answers to question A.1b; see appendix B). (2) P-values in squared brackets; \* significance at 5%; \*\* significance at 10%.

By contrast, the characteristics of individual shopping activity (such as a more careful search across retailers, the type of retailers, or the purchase of specific categories of products) are not significantly related to individual inflation perceptions, contrary to what one might expect.

The very low knowledge of the inflation concept and related statistics by Italian consumers (clearly documented in the paper) and an inaccurate memory of past prices turn out to play a significant role in explaining the highest class of inflation perceptions. This is an interesting category to investigate: while one may expect consumers to express this opinion in the presence of an exceptional event such as the cash changeover, it is less clear which factors may drive this belief in a period that presented no exceptional features like the one in which we carried out the survey. Memory and other psychological factors are also important in the relation with quantitative perceptions.

All in all, these results suggest that when consumers express their opinions on what they report as “inflation”, they are incorporating a complex combination of forces that go well beyond the phenomena measured by inflation statistics, including economic factors unrelated to inflation or personal characteristics that have very little relationship with actual price behaviour. This interpretation is consistent with the absence of macroscopic changes in investment and consumption behaviour in the recent years, contrary to what one would have observed if consumers were really convinced they were facing a yearly inflation rate of the order reported in the survey and were also able to appropriately assess the phenomenon this opinion refers to.

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## Appendix A – The survey

The survey was outsourced to a private company, IPSOS, and carried out by means of telephone interview. The questionnaire was preliminarily tested on a pilot sample, leading to the revision and fine-tuning of a few questions. The interviews were addressed to either the head of the household<sup>21</sup> or a member in charge of a substantial fraction of the households' spending; in other words, someone able to provide reliable information on the household's financial situation, being at the same time responsible for some of its purchases.

The sample was selected so as to be representative of the Italian population of households as of the 2001 ISTAT Population Census, and was stratified on the basis of the size of the municipality and the geographical area (see Table A1). In more detail, the sample was drawn in two stages (municipalities and households), with the stratification of municipalities by region and demographic size. Within each stratum, the municipalities in which interviews were to be conducted were selected as to include all those with a population of more than 100,000 inhabitants, whereas the smaller ones were selected randomly. The 970 final households to be interviewed were then selected randomly.

**Table A1 - Composition of the sample according to the initial stratification by size and geographical area**  
(percentages and number of observations)

Size of the municipality (population)	Centre	Islands	North-East	North-West	South	Total	# obs.
≤ 10,000	4.4	3.3	7.1	11.5	6.8	33.2	322
10,000-30,000	3.7	2.7	4.7	5.7	5.4	22.2	215
30,000-100,000	4.4	2.2	2.5	4.9	6.1	20.1	195
100,000-250,000	1.4	1.1	3.7	1	1.2	8.6	83
> 250,000	5.4	1.5	1.3	5.7	2.1	16	155
Total	19.4	10.8	19.4	28.9	21.5	100	-
Observations	188	105	188	280	209	-	970

The answers were weighted according to two alternative sets of weights. The first takes into account only the stratification criteria described in Table A1: each household was assigned a weight inversely proportional to its probability of being included in the sample. The second set – used to elaborate the descriptive statistics and the econometric exercises reported in the paper – is more complex, as it aims at making the results representative both with respect to the stratification criteria (size of municipality and geographical area) and with respect to the distribution of households according to the gender and age of the head of the household. To achieve this aim, the initial weight was modified to align the structure of the sample with that of the population in terms of gender, age, geographical area and size of the municipality of residence, along the lines described in Faiella et al. (2006) for other consumer surveys carried out by the Bank of Italy.<sup>22</sup>

Table A2 shows the composition of the sample according to the set of variables used to construct the post-stratification weights.

<sup>21</sup> The household is defined as a group of persons living together, whether or not related by kinship, who satisfy their needs by pooling together all or part of the income earned by its members.

<sup>22</sup> The results based on the former set of weights are in line with those reported in the paper.

**Table A2 - Composition of the sample according to: size, geographical area, gender, age, working status, professional category (1)**  
(number of observations and percentages)

<b>Post-stratification variables</b>	<b>Observations</b>	<b>%</b>
<b>Size of the municipality (population)</b>		
< 10,000	18	1.9
10,000 - 30,000	12	1.2
30,000 - 100,000	111	11.5
100,000 - 250,000	47	4.9
> 250,000	774	80.4
Total	962	100.0
<b>Geographical area</b>		
Centre	189	19.7
Islands	115	12.0
North-East	126	13.1
North-West	332	34.5
South	199	20.7
Total	962	100.0
<b>Gender</b>		
Male	678	70.5
Female	284	29.5
Total	962	100.0
<b>Age</b>		
< 30	71	7.3
30 - 40	110	11.4
40 - 50	196	20.3
50 - 65	385	40.0
> 65	202	21.0
Total	962	100.0
<b>Education</b>		
Up to middle school	333	34.7
High school or professional degree	411	42.7
University or postgraduate degree	217	22.6
Total	961	100.0
<b>Working status</b>		
Permanent employee	341	35.7
Fixed-term employee	37	3.9
Independent worker	130	13.6
Unemployed	56	5.9
Retired	296	30.9
Student	14	1.4
Housewife	81	8.5
Total	955	100.0
<b>Professional category</b>		
Self-employed worker	37	5.5
Retailer	33	4.8
Professional or entrepreneur	76	11.2
Production worker	128	18.8
Clerical worker	359	52.6
Manager	49	7.1
Total	682	100.0

*Notes:* (1) Based on answers to questions S.1, S.2, S.3, E.4, E.5, E.6 (see Appendix B). The maximum number of observations is 962 since 8 individuals did not answer the question on perceived inflation.

## Appendix B – The questionnaire

S.1 [For the interviewer: insert ISTAT code corresponding to the municipality]

S.2 Before we start could you tell me your year of birth?

Year of birth: 19|\_|\_|

S.3 Gender

Male.....1

Female .....2

A.1 In your opinion, prices in Italy over the last 12 months have

*(only one answer allowed)*

Risen a lot.....1

Risen moderately .....2

Risen slightly .....3

Stayed about the same .....4 (go to a A2)

Fallen .....5

Do not know (not to be read).....9 (go to A2)

*(only for those reporting 1,2, 3 or 5 in A1)*

A.1b Could you indicate the numerical value corresponding to your assessment?

Percentage: |\_|\_| , |\_| %

*(for everybody)*

A.2 In your opinion, since the period immediately before the introduction of banknotes and coins in euro, that is

since the end of 2001, until today, prices in Italy have ...

*(only one answer allowed)*

Increased less than 15%.....1

Increased between 15 and 30%.....2

Increased between 30 and 70%.....3

Increased more than 70% .....4

Do not know (not to be read).....9

*(for everybody)*

A.3 In your opinion, is there any good or service whose price has fallen over the last five years?

*(only one answer allowed)*

Yes.....1

No .....2 (go to A4)

Do not know/No answer (not to be read) (go to A4)

*(only for those reporting 1 in A3)*

A.3a Could you give an example?

*(open question; leave the possibility “do not know”)*

*(for everybody)*

A.4 Do you usually buy a newspaper?

*(only one answer allowed)*

Yes, everyday .....1

Yes, at least once a week .....2

Yes, rarely.....3

No, never .....4

Do not know (not to be read).....9

(for everybody)

A.5a Do you remember the price of a newspaper without any insert? Even in the case in which you do not buy a newspaper, could you try to indicate an estimate of its price?  
*[For the interviewer: where two different prices are indicated, referring to two different newspapers, record both. If a range is indicated (for instance between 80 and 90 cents) ask for an average price; leave the possibility "do not know".]*  
 First price:   ,    
*(insert the price in € with two digits; if it is lower than 1€, report "0, ...")*  
 Second price:   ,    
*(insert the price in € with two digits; if it is lower than 1€, report "0, ...")*

(for everybody)

A.5b Do you remember the price of a newspaper without any insert one year ago?  
*[For the interviewer: where two different prices are indicated, referring to two different newspapers, please record both. If a range is indicated ask for an average price; leave the possibility "do not know".]*  
 First price :   ,    
*(insert the price in € with two digits; if it is lower than 1€, report "0, ...")*  
 Second price:   ,    
*(insert the price in € with two digits; if it is lower than 1€, report "0, ...")*

(for everybody)

A.5c Do you remember the price in lire of a newspaper without inserts in 2001?  
*[For the interviewer: in case two different prices are indicated, referred to two different newspapers, please record both. If a range is indicated ask for an average price; leave the possibility "do not know".]*  
 First price:      
*(insert the price in lire)*  
 Second price:      
*(insert the price in lire)*

(for everybody)

B.1 Considering the overall monthly income available to your household and your monthly expenditures, typically at the end of the month:  
*(only one answer allowed)*

You must incur debts .....	1
You must draw on your savings .....	2
You are right on the limit.....	3
You can save something .....	4
You can save quite a lot.....	5
Do not know / no answer (not to be read).....	9

(for everybody)

B.2 Do you pay rent for the house in which you live?  
*(only one answer allowed)*

Yes.....	1
No .....	2 (go to B3)
Do not know / no answer (not to be read).....	9

*(only for those reporting 1 in B2)*

B.2a In percentage terms, what share of the overall monthly income of your household is devoted to paying the rent?  
*(only one answer allowed)*

Less than 30%.....	1
Between 30 and 50% .....	2
More than 50% .....	3
Do not pay a rent .....	4
Do not know / no answer (not to be read).....	9

- B.3 Over the last 5 years, were you involved in a transaction to buy a house, or at least actively searching to buy or sell a house?  
*(more than one answer allowed)*
- |   |   |
|---|---|
| Bought .....  | 1 |
| Sold.....   | 2 |
| Search for buying.....                              | 3 |
| Search for selling.....                             | 4 |
| None of the above activities (not to be read) ..... | 5 |
| Do not know / no answer (not to be read).....       | 9 |

- C.1 Let's now turn to your purchases, in other words to the products you buy. In your opinion has the average price of these products changed during the last year? If so, could you indicate a numerical value corresponding to your assessment?  
*[For the interviewer: insert positive or negative figure; if prices have not changed, insert "0"]*  
 Percentage:   ,  %

*(for everybody)*

- C.2 Are you, in your household, the person who typically purchases the following products, thereby also evaluating their prices? For each type of purchase, please answer YES or NO.  
*(read in random order)*

	Yes	No	Yes with other members <i>(do not force it)</i>
Food.....	1	2	3
Cars and/or motorcycles .....	1	2	3
TV and electronic appliances.....	1	2	3
Personal computers.....	1	2	3
Mobile phones .....	1	2	3
Restaurant bills .....	1	2	3

*(only for those reporting 1 to "Food" in C2)*

- C.3 Let's now turn to your purchases of food products. Do you typically carry out your purchases in the same retailers?  
*(read)*  
 Yes, even if more the one, but always the same ..... 1  
 No ..... 2

*(only for those reporting 1 to "Food" in C2)*

- C.3a In your opinion, has the average price of the food products you normally purchase changed during the last year? If so, could you indicate a numerical value corresponding to your assessment?  
*[For the interviewer: insert positive or negative figure; if prices have not changed, insert "0"]*  
 Percentage:   ,  %

*(only for those reporting 1 to "Food" in C2)*

- C.4 I will now list some types of sales outlets. Please indicate the frequency at which you carry out your food purchases in each of them, choosing between "always or almost always", "often", "sometimes", "never or almost never".  
*(only one answer allowed for each type)*

	Always or almost always	Often	Sometimes	Never or almost never	Do not know (not to be read)
a. Hard discount	1	2	3	4	5
b. Supermarket/Hypermarket	1	2	3	4	5
c. Local market	1	2	3	4	5
d. Small corner shop	1	2	3	4	5

(only for those reporting 1 to "Food" in C2 and 1 in C3)

C.5 Thinking of the retailers where you typically purchase food, has it occurred, over the last year, that very high price increases have induced you to change retailer ?  
 (only one answer allowed)

Never .....1  
 Almost never.....2  
 In some cases.....3  
 In many cases.....4  
 Do not know / no answer (not to be read).....9

(only for those reporting 1 o 2 in C5)

C.5a What is the main reason underlying the fact that you never/almost never changed retailer ? Over the last year the prices of food charged by these retailers:  
 (only one answer allowed)

Did not increase much..... 1  
 Increased a lot but the same happened in other retailers ..... 2  
 Increased a lot but for convenience I chose not to change retailer ..... 3  
 Do not know / no answer (not to be read)..... 9

(only for those reporting 1 to "Food" in C2)

C.6 How do you react to a steep increase (for example more than 50%) in the price of a vegetable you normally buy?  
 (only one answer allowed)

I buy it in the usual quantity despite the price increase ..... 1  
 I buy it in a smaller quantity..... 2  
 I substitute it temporarily with another variety ..... 3  
 I do not buy it ..... 4  
 Do not know / no answer (not to be read)..... 9

(for everybody)

C.7 I will now read a list of goods. For each please indicate whether you have purchased one during the last 5 years. For each type of good, please answer YES or NO.  
 (read in casual order)

	Yes	No
TV and electronic appliances.....	1	2
Personal computers.....	1	2
Mobile phones.....	1	2

(only for those reporting at least one 1 to C7)

C.8 How many retailers do you normally visit before buying one of the goods listed in the previous question, for example looking for the best deal?  
 (only one answer allowed)

1 ..... 1  
 2 or 3.....2  
 more than 3.....3  
 Do not know / no answer (not to be read)..... 9

(for everybody)

C.9 Do you use the Internet to purchase or to gather information on the products you intend to purchase?  
 (only one answer allowed)

Often ..... 1  
 Rarely ..... 2  
 Never ..... 3  
 Do not know / no answer (not to be read)..... 9

(only for those reporting 1 to "Mobile phones" in C7)

C.10 You have reported buying a mobile phone in the last 5 years. Did you do it in order to replace an older model?  
 (only one answer allowed)

Yes..... 1  
 No, I bought it for someone else..... 2  
 Do not know / no answer (not to be read)..... 9

- (only for those reporting 1 in C10)
- C.11 Thinking of the last time you replaced your old mobile phone, which of the following statements best reflects your choice? You would say you chose a model:  
(only one answer allowed)
- |  |   |
|--|---|
| With the same options at the same price than the old one .....     | 1 |
| With the same options at a lower price than the old one .....      | 2 |
| With more options at the same or lower price than the old one..... | 3 |
| With many more options at a higher price than the old one .....    | 4 |
| Do not know / no answer (not to be read).....                      | 9 |
- (for everybody)
- C.12 When a new technological product (such as a mobile phone or a digital camera) is put on the market with better characteristics with respect to the one you already own, which of the following best describes your behaviour?  
(only one answer allowed)
- |   |   |
|---|---|
| I buy it immediately .....                                | 1 |
| I buy it when the price falls .....                       | 2 |
| I don't buy it until the one I own no longer works .....  | 3 |
| I don't have any of these products (not to be read) ..... | 4 |
| Do not know / no answer (not to be read) .....            | 9 |
- (for everybody)
- C.13 Do you have an ATM card or a credit card?  
(only one answer allowed)
- |  |   |
|--|---|
| Yes .....                                      | 1 |
| No .....                                       | 2 |
| Do not know / no answer (not to be read) ..... | 9 |
- (only for those reporting 1 in C13)
- C.14 How frequently do you use the ATM or credit card to purchase something? Please consider also lower value purchases, for instance under 30 euro.  
(only one answer allowed)
- |   |   |
|---|---|
| Always.....                                   | 1 |
| Often .....                                   | 2 |
| Rarely .....                                  | 3 |
| Never .....                                   | 4 |
| Do not know / no answer (not to be read)..... | 9 |
- (for everybody)
- D.1 In your opinion, which one of the following statements best corresponds to the statement “inflation has been 2% in Turin and 3% in Milan”?  
(only one answer allowed)  
[For the interviewer, read the possible answers in casual order]
- |  |   |
|--|---|
| Prices are lower in Turin than in Milan .....          | 1 |
| Prices in Turin have increased less than in Milan..... | 2 |
| The two answers are equivalent (not to be read) .....  | 3 |
| Do not know / no answer (not to be read).....          | 9 |
- (for everybody)
- D.2 In your opinion, which of the two following price variations corresponds to the higher increase in percentage terms?  
(only one answer allowed)  
[For the interviewer, read the possible answers in random order]
- |   |   |
|---|---|
| A price rise from 10 to 20 euros .....        | 1 |
| A price rise from 100 to 150 euros .....      | 2 |
| Do not know / no answer (not to be read)..... | 9 |

- (for everybody)
- D.3 In your opinion, which of the following groups of products is taken as a reference within the sample, or basket of goods, used to calculate inflation in Italy?  
(only one answer allowed)  
[For the interviewer, read the possible answers in random order]
- |  |   |
|--|---|
| Products bought by Italian households as a whole ..... | 1 |
| Essential products .....                               | 2 |
| Products whose price has increased .....               | 3 |
| Do not know / no answer (not to be read).....          | 9 |
- (for everybody)
- D.4 In your opinion, does ISTAT, the statistical institute, also consider dwelling purchase prices when calculating inflation?  
(only one answer allowed)
- |   |   |
|---|---|
| Yes .....                                     | 1 |
| No .....                                      | 2 |
| Do not know / no answer (not to be read)..... | 9 |
- (for everybody)
- D.5 In your opinion, does ISTAT measure inflation:  
(only one answer allowed)
- |   |   |
|---|---|
| Very well .....                               | 1 |
| Quite well .....                              | 2 |
| Quite badly .....                             | 3 |
| Very badly .....                              | 4 |
| Do not know / no answer (not to be read)..... | 9 |
- (for everybody)
- D.6 Please tell me, even approximately, the lira/euro conversion rate.  
[For the interviewer, if unclear specify that the question refers to the official conversion rate]  
1 € = | | | | | , | | | | | lire (leave the possibility "do not know")

To conclude, a few questions useful for classifying your answers.

- (for everybody)
- E.1 How many people, including yourself, currently live in your household?
- |   |   |
|---|---|
| 1 .....                                     | 1 |
| 2 .....                                     | 2 |
| 3 .....                                     | 3 |
| 4 .....                                     | 4 |
| 5 .....                                     | 5 |
| 6 .....                                     | 6 |
| More than 6.....                            | 7 |
| Do not know/No answer (not to be read)..... | 9 |
- (for everybody)
- E.2 How many of your household's members earned an income of any nature during the last 6 months?  
(only one answer allowed)
- |   |   |
|---|---|
| 1 .....                                     | 1 |
| 2 .....                                     | 2 |
| 3 .....                                     | 3 |
| 4 .....                                     | 4 |
| 5 .....                                     | 5 |
| 6 .....                                     | 6 |
| More than 6.....                            | 7 |
| Do not know/No answer (not to be read)..... | 9 |

*(for everybody)*

E.3 Do the above incomes contribute to maintain other people (for instance, children, parents, etc.) who live somewhere else?  
*(only one answer allowed)*

Yes.....	1
No .....	2
Do not know/No answer (not to be read).....	9

*(for everybody)*

E.4 What is your current employment situation?  
*(only one answer allowed)*

Permanent employee.....	01
Fixed-term employee or consultant .....	02
Independent worker .....	03
Unemployed.....	04
Unemployed looking for a job for the first time .....	05
Pensioner (from occupation).....	06
Pensioner for other reasons (e.g invalid, war wounds).....	07
Student.....	08
Housewife .....	09
Other (please specify).....	10
Do not know/No answer (not to be read).....	99

*(only if E.4 different from 04, 05, 07, 08, 09 or 99)*

E.5 Which professional category do you belong to?  
*(only one answer allowed)*

Self-employed worker .....	1
Retailer .....	2
Professional .....	3
Entrepreneur .....	4
Blue-collar / production worker.....	5
Clerical worker / teacher.....	6
Manager .....	7
Other (please specify).....	8
Do not know / No answer (not to be read).....	9

*(for everybody)*

E.6 What is your educational qualification?  
*(only one answer allowed)*

None.....	1
Elementary school .....	2
Middle school .....	3
High school or professional diploma .....	4
University degree.....	5
Postgraduate qualification .....	6
Do not know/No answer (not to be read).....	9

## Appendix C – Descriptive results

**Table C.1 - Inflation perceptions by socio-demographic characteristics (1)**  
(percentages)

	Perceived inflation					
	Qualitative				Quantitative	
	Low	Moderate	High	Total	Mean	Median
<b>Size of the municipality (residents)</b>						
≤ 10,000	32.0	44.5	23.5	100.0	18.0	15
>10,000 and < 30,000	28.9	42.5	28.6	100.0	17.0	10
≥ 30,000 and < 100,000	38.8	36.9	24.2	100.0	15.3	10
≥ 100,000 and < 250,000	28.8	55.5	15.7	100.0	12.6	8
≥ 250,000	31.3	48.8	19.8	100.0	18.4	10
<b>Geographical area</b>						
Centre	30.5	53.8	15.7	100.0	13.6	10
Islands	8.3	69.1	22.6	100.0	28.0	20
North-East	46.7	19.5	33.9	100.0	10.3	4
North-West	38.7	43.4	18.0	100.0	13.4	10
South	27.0	54.3	18.8	100.0	26.2	20
<b>Gender</b>						
Male	35.6	49.4	15.0	100.0	15.2	10
Female	23.6	43.3	33.1	100.0	24.1	20
<b>Age</b>						
< 30	1.7	54.8	43.5	100.0	21.6	20
30-40	62.8	19.7	17.5	100.0	9.9	5
40-50	27.8	45.1	27.1	100.0	18.1	10
50-65	31.5	51.5	17.0	100.0	19.7	10
> 65	31.2	55.4	13.4	100.0	17.2	20
<b>Education</b>						
Up to middle school	27.5	44.8	27.7	100.0	25.1	20
High school or professional diploma	31.3	47.6	21.1	100.0	16.2	10
University or postgraduate degree	40.5	52.0	7.4	100.0	10.2	10
<b>Working status</b>						
Permanent employee	40.0	35.2	24.8	100.0	16.8	10
Fixed-term employee	36.2	45.8	18.0	100.0	14.2	15
Independent worker	22.2	73.7	4.1	100.0	17.0	10
Unemployed	0.6	40.7	58.7	100.0	16.9	10
Retired	35.3	54.2	10.6	100.0	17.3	10
Housewives	6.1	55.4	38.6	100.0	25.8	10
Students	27.2	36.7	36.1	100.0	24.7	20
<b>Professional category</b>						
Self-employed worker	23.5	61.5	15.0	100.0	17.7	20
Retailer	6.0	86.0	8.0	100.0	29.8	40
Professional or entrepreneur	47.5	48.7	3.8	100.0	6.7	7
Production worker	19.5	59.5	21.0	100.0	24.2	20
Clerical worker	45.3	35.7	19.1	100.0	13.7	10
Manager	4.4	78.5	17.1	100.0	17.5	20
<b>Total sample</b>						
Frequency	308	458	195	962	17.7	10.0
Percentage	32.1	47.6	20.3	100.0		

Notes: (1) Based on answers to questions A.1, A.1b, S.1, S.2, S.3, E.4, E.5, E.6 (see Appendix B).

**Table C.2 – Knowledge and understanding of inflation statistics (1)**  
(percentages)

	Responses		Inflation perceptions				
	%	Qualitative				Quantitative	
		Low	Moderate	High	Total	Mean	Median
<b>Price levels versus price changes</b>							
Wrong / Doesn't know	52.9	39.1	34.9	26.0	100.0	16.8	10
Right	47.1	24.1	61.9	14.0	100.0	18.7	10
<b>Absolute price changes versus percentage price changes</b>							
Wrong / Doesn't know	27.3	40.4	36.7	22.9	100.0	19.5	15
Right	72.7	28.9	51.7	19.4	100.0	17.1	10
<b>Composition of the price index basket</b>							
Wrong / Doesn't know	66.9	33.1	44.6	22.3	100.0	18.0	10
Right	33.2	29.9	53.8	16.3	100.0	17.2	10
<b>Treatment of house prices in the price index basket</b>							
Wrong / Doesn't know	51.4	29.1	46.4	24.5	100.0	20.4	10
Right	48.6	35.2	48.9	15.9	100.0	15.1	10
<b>Composite indicator of the degree of knowledge of inflation</b>							
0	9.2	48.3	32.2	19.6	100.0	21.4	15
1	24.6	35.2	29.8	35.1	100.0	17.7	10
2	31.5	27.9	54.3	17.8	100.0	20.1	17
3	24.8	30.4	56.7	12.8	100.0	12.5	10
4	9.9	26.7	62.3	11.1	100.0	20.4	20
<b>Total sample</b>	100.0	32.1	47.6	20.3	100.0	17.7	10

Notes: (1) Based on answers to questions D.1, D.2, D.3, D.4 (see Appendix B). The “composite indicator” refers to the number of “correct” answers to the above questions.

**Table C.3 - Awareness of price reductions (1)**  
(number of observations and percentages)

	Responses		Perceived inflation				
	%	Qualitative				Quantitative	
		Low	Moderate	High	Total	Mean	Median
<b>Awareness of price reductions</b>							
yes	17.1	62.9	25.2	11.9	100.0	7.9	7.0
no	79.9	26.1	51.6	22.3	100.0	19.9	15.0
don't know	3.0						
<b>Total</b>	100.0	32.1	47.6	20.3	100.0	17.7	10.0

Notes: (1) Based on answers to questions A.1, A.1b, A.3 (see Appendix B).

**Table C.4 – Recall of newspapers’ price and euro-lira conversion rate (1)**  
(percentages)

	Responses	Perceived inflation					
		Qualitative			Quantitative		
		Low	Moderate	High	Total	Mean	Median
<b>current price (€)</b>							
less than 0.80	0.1	14.2	32.5	53.3	100.0	28.6	30
between 0.80 and 0.89	1.8	0.5	96.6	2.9	100.0	10.3	10
between 0.90 and 1	86.0	36.8	47.6	15.6	100.0	15.8	10
between 1.01 and 1.10	1.3	40.2	16.2	43.6	100.0	34.0	20
more than 1.10	10.8	16.1	31.4	52.5	100.0	22.3	20
Total	100.0	33.9	46.4	19.8	100.0	16.4	10
<b>price one year earlier (€)</b>							
less than 0.80	8.3	4.0	71.1	24.9	100.0	25.4	40
between 0.80 and 0.89	16.2	27.5	59.5	13.0	100.0	16.9	10
between 0.90 and 1	69.9	38.6	43.5	17.9	100.0	15.6	10
between 1.01 and 1.10	3.0	10.6	0.8	88.6	100.0	10.2	0 (2)
more than 1.10	2.6	5.4	19.0	75.7	100.0	26.8	30
Total	100.0	32.2	46.5	21.3	100.0	16.7	10
<b>price in 2001 (lire)</b>							
less than 1,000	19.4	33.3	62.4	4.4	100.0	17.4	10
equal to 1,000	40.4	26.7	44.5	28.9	100.0	22.2	20
between 1,000 and 1,499	19.8	26.9	58.7	14.5	100.0	12.8	10
equal to 1,500	16.1	30.0	41.6	28.4	100.0	19.8	20
more than 1,500	4.4	78.3	11.1	10.6	100.0	9.1	8
Total	100.0	30.8	48.8	20.4	100.0	18.1	12
<b>lira-euro conversion rate (3)</b>							
correct	77.4	37.4	45.7	16.9	100.0	13.4	10
close to correct	16.6	19.4	57.1	23.5	100.0	34.3	30
incorrect	6.0	9.6	66.4	24.0	100.0	32.4	40
Total	100.0	32.8	48.8	18.4	100.0	17.8	10

Notes: (1) Based on answers to questions A.5a, A.5b, A.5c, D.6 (see Appendix B). - (2) This value results from the very low number of respondents belonging to this category and the weighted distribution of their answers. - (3) Legend: "correct" denotes an error smaller than 10 lire; "close to correct" an error between 10 and 70 lire (thus including the mental approximate conversion rate of 1 euro=2,000 lire); "incorrect" an error greater than 70 lire.

**Table C.5 - Households' economic condition (1)**  
(number of observations and percentages)

	Responses		Perceived inflation					
	Frequency	%	Qualitative				Quantitative	
			Low	Moderate	High	Total	Mean	Median
<b>Financial situation</b>								
incur debts or draw on savings	195	20.4	9.8	62.8	27.3	100.0	24.4	20
right on the limit	404	42.4	26.5	52.1	21.4	100.0	20.8	20
save something or quite a lot	355	37.2	50.2	34.8	15.0	100.0	11.5	7
Total	954	100.0	31.9	47.8	20.2	100.0	17.8	10
<b>Incomes per member (2)</b>								
<0.25	93	9.8	15.6	53.1	31.4	100.0	25.2	20
>0.25 and ? 0.5	265	28.1	27.1	49.3	23.7	100.0	20.1	15
>0.5 and <1	182	19.3	20.3	64.0	15.7	100.0	22.4	20
1	404	42.8	45.6	37.5	16.9	100.0	11.8	10
Total	944	100.0	32.6	47.4	20.0	100.0	17.6	10
<b>Pay a rent</b>								
yes	195	20.3	24.7	46.4	28.8	100.0	27.3	20
no	767	79.7	33.9	47.9	18.2	100.0	15.4	10
Total	962	100.0	32.1	47.6	20.3	100.0	17.7	10
<b>Dwelling transaction or search</b>								
yes	310	34.6	42.9	41.7	15.4	100.0	11.5	8
no	587	65.4	28.5	48.1	23.4	100.0	18.9	10
Total	897	100.0	33.5	45.9	20.7	100.0	16.2	10

Notes: (1) Based on answers to questions A.1, A.1b, B.1, B.2, E.1, E.2 (see Appendix B). - (2) Ratio of the number of household's members earning an income and total household's members.

## Appendix D – The variables included in the econometric model

Explanatory variables	Definition	Expected sign of the relationship with inflation perceptions
knowledge	Dummy variable assuming value 1 if the respondent provides the correct answer to at least 3 out of four questions on the understanding of inflation and of inflation statistics, and 0 otherwise (D.1, D.2, D.3, D.4)	-
buy food products	Dummy variable assuming value 1 if the respondent usually takes charge of food purchases, and 0 otherwise (C.2)	+
buy durable products	Variable assuming values from 0 to 3 according to the number of durables considered in the questionnaire (TV, personal computer, mobile phone) actually purchased by the respondent during the last 5 years (C.7)	-
awareness of price decreases	Dummy variable assuming value 1 if the respondent reports that something has become cheaper during the last five years, and 0 otherwise (A.3)	-
newspaper price last year	Dummy variable assuming value 1 if the respondent correctly recalls the price of a newspaper 1 year before the study (range 0.90-1 euro) and 0 otherwise (A.5b)	-
newspaper price 5 years ago	Dummy variable assuming value 1 if the respondent has a very incorrect recall of the pre-euro price of a newspaper (i.e. indicates 1,000 lire) and 0 otherwise (A.5c)	+
lira-euro exchange rate	Variable assuming values 1 if the respondent reports a lira-euro conversion rate which differs (in absolute term) from the correct rate by less than 10 lire, 2 if the difference is between 10 and 70 lire (thus including the mentally approximation 1 euro=2,000 lire), and 3 for differences greater than 70 lire (D.6)	+
financial situation	Dummy variable assuming value 0 if the respondent reports that in order to meet monthly expenditure he/she has either to incur debts or draw on savings and 1 otherwise (B.1)	-
incomes per member	Dummy variable assuming value 1 if each member of the family earned an income over the last 6 months, and 0 otherwise (E.1, E.2)	-
pay a rent	Dummy variable assuming value 1 if the respondent pays a rent for the dwelling in which he/she lives and spends for this item a fraction of his/her monthly income greater than 30%, and 0 otherwise (B.2, B.2a)	+
dwelling transaction	Dummy variable assuming value 1 if the respondent, during the last 5 years, has been involved in an activity related to buying or selling a dwelling, and 0 otherwise (B.3)	+/-
search	Dummy variable assuming value 1 if the respondent normally visits more than 3 retailers before purchasing a durable good (TV, personal computer, mobile phone) and 0 otherwise (C.3)	-
use of internet	Variable assuming value 1 if the respondent uses the Internet "often" to purchase or to gather information on the products he/she intends to purchase, and 0 otherwise (C.9)	-
use of cash card	Variable assuming value 0 if the respondent does not possess a cash or credit card, 1 if he/she possesses a card but uses it only rarely or never, 2 if he/she uses the card often or always (C.13, C.14)	-

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