BANCA D'ITALIA

EUROSISTEMA

Temi di discussione
del Servizio Studi

Memory for prices and the euro cash changeover: An analysis for cinema prices in Italy

by Vincenzo Cestari, Paolo Del Giovane and Clelia Rossi-Arnaud

Number 619 - February 2007

The purpose of the Temi di discussione *series is to promote the circulation of working papers prepared within the Bank of Italy or presented in Bank seminars by outside economists with the aim of stimulating comments and suggestions.*

The views expressed in the articles are those of the authors and do not involve the responsibility of the Bank.

MEMORY FOR PRICES AND THE EURO CASH CHANGEOVER:
AN ANALYSIS FOR CINEMA PRICES IN ITALY

by Vincenzo Cestari*, Paolo Del Giovane** and Clelia Rossi-Arnaud***

Abstract

The question addressed by this study is whether consumers remember past prices correctly. We test Italian citizens' memory for cinema prices with questionnaires distributed to movie-goers. The analysis concentrates on the memory of pre-euro prices, but the recall for a more recent period is also investigated. The results show that only a small percentage of respondents recalled the correct price, and that the average prices recalled were much lower than the actual pre-euro prices and dated back to years before the changeover. Price recall is less accurate for the respondents who perceive higher and more persistent inflation; it is also worse for the older respondents and for the less frequent movie-goers.

Contents

---

*   Università Lumsa, Faculty of Educational Science, and CNR, Institute of Neuroscience.

**   Banca d'Italia, Economic Research Department.

*** Università di Roma "La Sapienza", Psychology Department.

1. Introduction[1]

Following the introduction of euro banknotes and coins euro-area residents perceived a much sharper increase in prices than the moderate rise registered by official statistics. The perceived surge in prices was popularly associated with the cash changeover, even though the official estimates of the national statistical institutes and central banks indicated that the impact on consumer prices had been modest.

Several studies have suggested explanations for the disparity between perceived and measured inflation. European Central Bank (2003a,b) and Aucremanne and Collin (2005) discuss the issue for the euro area as a whole, and a series of papers examine individual countries (for a survey see Del Giovane and Sabbatini 2005). In the case of Italy, where the phenomenon was particularly intense and persistent, Del Giovane and Sabbatini (2006) cite several factors that contributed to determining the disparity. They include the combination between the psychological mechanisms at work in the formation of inflation perceptions (stronger impact of more frequently purchased products[2] and asymmetric perceptions of price increases and decreases[3]) and the characteristics of the distribution of price changes after the changeover (larger price rises for frequently bought goods and services, an increase in the proportion of prices that changed, whether upwards or downwards, and a higher percentage of very large increases in the service sector). The effect of these factors may have been amplified if there was a link between individuals' expectations about the impact of the cash changeover and their ex-post perceptions (Traut-Mattausch *et al.* 2004).

Gaiotti and Lippi (2004) and Del Giovane and Sabbatini (2006) suggest, further, that the individual perceptions of high inflation may also have been related to an inaccurate memory of pre-euro prices and a difficulty in distinguishing the period of time over which the price change has taken place. This may have induced consumers to blame the euro also for price rises that came before its introduction and had nothing to do with the new currency. In the case of durable goods, which are purchased rarely, for example, it is most likely that consumers, mentally referring to their last purchase, refer to a time before December 2001. For goods and services that are bought more frequently, the consumer's memory might refer not to a single price but to a number of prices observed over a more or less extended span of time or at different sales points.[4]

Little is known about the mechanisms underlying the memory for prices. Although this can be considered as part of the question of everyday memory (Neisser, 1982; Cohen, 1996), evidence from cognitive studies on this issue is seldom found in psychological

---

[2] This hypothesis is confirmed by the experimental evidence provided by Marques and Dehaene (2004).

[3] Relevant examples of the heuristics employed in subjective assessments and asymmetry in subjective evaluation are provided respectively by Tversky and Kahneman (1974) and Kahneman and Tversky (1979).

[4] Gaiotti and Lippi (2004) report interesting results on Italian restaurant prices, which are a frequently mentioned example of the impact of the new currency. According to this study, the price rise recorded by Italian restaurants in 2002 (about 9 per cent) was only part of an overall increase of 40 per cent between 1998 and 2003. Furthermore, contrary to the popular belief, the restaurant price rises around the changeover period, though large, were not exceptional with respect to the previous period: 2002 was characterized by a surge in the percentage of restaurants that changed prices, not by the greater size of the changes (which actually peaked in 2001, before the introduction of the euro).

research. Rather, it is covered in a broader social sciences literature that includes marketing and consumer behaviour (Dickson and Sawyer 1990; Monroe and Lee 1999).

The present study presents an assessment of the hypothesis that consumers have an imperfect memory for past prices. Although we concentrate on the particular case of the euro changeover, the issue has a broader relevance. The lively debate in the post-changeover period shows that consumers have strong opinions on inflation. In principle, this implies that they should be able to calculate, at least roughly, the rate of change in the prices of the wide range of goods and services included in the official index. To do so, however, they need to remember the past prices of these products. Even considering the individual's personal experience of inflation, rather than the average inflation in a country, consumers should at least be able to remember the past prices of the products that make up their personal consumption basket. The question addressed by this study is whether they actually can.

Our analysis fits in with the recent behavioural economic literature, which postulates deviations from the assumption of rational, computationally unconstrained agents. This literature has explored the implications of consumers' having limited information-processing capacity and being rationally inattentive (see, among others, Sims 2003, Ameriks *et al.* 2004, Levy *et al.* 2006, Reis 2006) or having limited memory (Mullainathan 2002). Mastrobuoni (2004) and Ehrmann (2006) investigate whether imperfect information models can explain the evolution of prices and the mismatch between perceived and actual inflation in the aftermath of the euro cash changeover.

The changeover period is chosen for the study as a particularly interesting case per se and because it bears on the key question of whether inflation perceptions in the post-changeover period are related to the presence of a bias in price recall. Although inflation perceptions have receded in Italy since 2004 (as shown by the European Commission surveys), we are still confronted with the belief by many citizens that the present prices of most products are twice as high, or in any case much higher, than they were before the introduction of the euro. The old prices of many goods and services are commonly believed to have been converted at a rate of 1,000 lire to the euro, rather than at the official rate of 1,936.27. This widespread belief is based on what consumers claim to be precise recall of the pre-euro prices, which is a good reason to investigate whether their confidence in their memory is well-founded. We also consider the possibility of a reversed causal link, from the conviction that many prices have doubled to a "memory" that simply confirms that belief.

Our study focuses on Italian consumers' memory of cinema prices, submitting a questionnaire to movie-goers. We chose this price because it can be reconstructed for the past with extreme precision and is less subject to differences (due to quality or brand) than many other goods and services. And as the survey was conducted in movie theatres we can be sure that the sample consists of people who actually consume that particular service at least occasionally (participants were in any case requested to specify their frequency of movie-going).

The answers on recalled prices are analysed in the light of further questions aimed at elucidating the mechanisms of price recall; measuring the relationship between price memories and such other factors as habits in using the new currency (mental conversion into lire vs. thinking in euro), frequency of movie-going and attitudes toward the euro; and assessing the relationship between the memory of the specific price considered and the perceptions on the average change in the general price level. Lastly, the results on price recall are also related to personal characteristics (age, gender, education and occupation).

To investigate the extent to which consumers' memory for prices is influenced by the change of currency, alternative questionnaires were given to two different sub-groups of

respondents, asking, respectively, the pre-euro price expressed in euro (rather than in lire as in the standard questionnaire) or the price in 2003.

Respondents were asked to recall both the full and the reduced price. Italian cinemas typically offer reduced prices on weekday afternoons or on one weekday evening. In Rome, where the questionnaire was to be given, a Wednesday reduction was introduced in February 1998 and maintained thereafter, including the changeover period. To control that the answers for the full price were not influenced by memory of the reduced price and also to test respondents' memory using a second price we included separate questions for the two prices.

2. The method

2.1 The respondents

Respondents were randomly sampled among members of the audience in movie theatres; they participated on a voluntary basis. Respondents older than 65 years of age were excluded as they enjoyed a discounted ticket in 2001 and/or at the moment of the study. A total of 225 people filled in one of the questionnaires. The number of respondents for each questionnaire, with gender, age and education, is shown in Table 1. The questionnaires were given in two well-know cinemas in Rome[5] whose price in 2001 coincided with the mode for all first-run movie theatres in Rome. We chose these two cinemas also because they ensured good control on the survey conditions (full co-operation by the employees and a suitable area where people could fill out the questionnaires without interference). It is worth noting that these cinemas are attended by an audience characterized by a high level of education (and presumably income) and rather high frequency of movie-going. The experiment followed a between-subject design, i.e. each group of respondents filled in only one questionnaire.

Table 1. Respondents

	Questionnaire on pre-euro price in lire	Questionnaire on pre-euro price in euro	Questionnaire on 2003 price
Number of respondents	150	40	35
Male	53	20	10
Female	88	18	24
Gender not indicated	9	2	1
Age range	19-65	18-62	18-65
Mean age (stand. dev.)	42 (11.77)	40 (12.87)	44 (15.72)
Lower than high-school degree	3	2	
High-school degree	36	25	
University degree	107	48	
Education not indicated	4	0	

Note: Information is provided separately for each of the three questionnaires used (see section 2.2).

2.2 The questionnaires

Our standard questionnaire is reproduced in Appendix 1. It comprised 14 questions plus 4 items on personal data (age, gender, education, occupation). The first two questions regarded memory for cinema prices (for the full and the reduced price respectively) with reference to the period immediately preceding the changeover, when prices were still in lire.

The other questions were intended first, to capture the mechanisms through which prices were recovered (e.g. memory vs. calculation); second, to elicit frequency of movie-going, habits in using the new currency (mental conversion into lire vs. thinking in euro) and

---

[5] Cinema Nuovo Sacher and Cinema Quattro Fontane.

attitudes towards the euro both before its introduction and currently; third, to record the perceptions on the average change in the general price level.

To investigate how the memory of prices is influenced by the currency changeover, two alternative questionnaires were administered to separate groups of respondents. One was asked to indicate the pre-euro price expressed in euro rather than in lire as in the standard questionnaire, the other the price in 2003. Where necessary the other questions were slightly adjusted. The rationale was to check whether expressing the old price in euros encouraged consumers to better reflect on the difference between the recalled and the present price and on the implicit rate of change, thereby improving the accuracy of the recall. The question on the 2003 price allowed us to verify the correctness of memory with respect to a more recent period that did not coincide with a currency changeover.

2.3 The procedure

The questionnaires were administered by doctoral students in psychology, under the supervision of the authors, on four evenings in May 2006. Participants were asked to answer the questions in order and without reading ahead. They were given no time limit and asked to complete the questionnaire as accurately as possible without communicating with other participants.

The answers on the pre-euro price expressed in euro and on the price in 2003 were compared with those on the pre-euro price expressed in lire by considering, for the latter, only the questionnaires administered in the same movie theatre and on the same evenings.

Price memory was compared with the actual prices in effect before the launch of the euro. Since the questionnaire asked for the price in lire in the period "immediately preceding" the cash changeover we could have simply considered the price at the very end of 2001. However, since several movie theatres in Rome had raised their prices in mid-December 2001, we considered the actual prices both in the first half and in the second half of December, taking into account that: a) the price increase in mid-December could be interpreted as an anticipated effect of the euro and b) the last price in lire might have not been memorized by the public, as it lasted only two weeks.

On 8 December the average cinema price was 12,630 lire, while both the median and the mode were 13,000 lire. On 22 December the mean was slightly higher, the median unchanged and the mode had become 14,000. As to the possibility that the prices in the first half of December had also been affected by the imminent changeover, analysis of the time series in the previous years shows that that this was not the case, since prices had been at about the same levels in the four years preceding the changeover (see below for more evidence).

On this basis we considered as a correct memory for the pre-euro price of the full ticket both 13,000 lire (the mode prevailing until a few weeks before the changeover and in the four previous years except 2000) and 14,000 lire, which was the mode of the very last price in lire. These were the prices charged in the first and second half of December, respectively, in our two cinemas and in other movie theatres with the same quality standard and so correspond closely to the questionnaire (which asked the price in a first-run movie theatre "similar to this one"). The answer 12,000 lire was considered as close to correct, since this was the price still charged by about 20 per cent of the cinemas at the end of 2001.

For the reduced price, the correct answer was 8,000 lire, the price charged by a large majority of the cinemas that offered a discount on Wednesday. At the time of the changeover

that reduced price (agreed and advertised by the association of cinemas in Rome) had been unchanged for almost four years, since its introduction in February 1998.

3. The results

3.1 Documenting the discrepancy between recalled and actual pre-euro prices

The main finding is that our sample's recalled pre-euro prices are much lower than the actual prices at the end of 2001. Figure 1 compares the percentage of respondents recalling each price (dark histogram) with the percentage of cinemas that actually charged that price in the first half of December 2001 (light histogram).

Only 8 per cent of the respondents said either 13,000 or 14,000, which we consider to be the correct answers (see Section 2.3). A sixth (16.7 per cent) indicated 12,000, which is close to correct. The majority (56 per cent) indicated prices lower than 10,000 lire, which were non-existent in the months preceding the launch of the euro.

Interestingly, the mode of the recalled price (7,000 lire) corresponds to the mode of the prices at the time of the study (7 euro) converted at a rate of 1,000 lire to 1 euro.

Figure 1. Recalled vs. actual cinema prices (full ticket)

On the horizontal axis, the prices of full cinema tickets (in lire); on the vertical axis, the percentage of respondents indicating the price as their recall (dark histogram) and the percentage of cinemas that charged that price in the first half of December 2001 (light histogram).
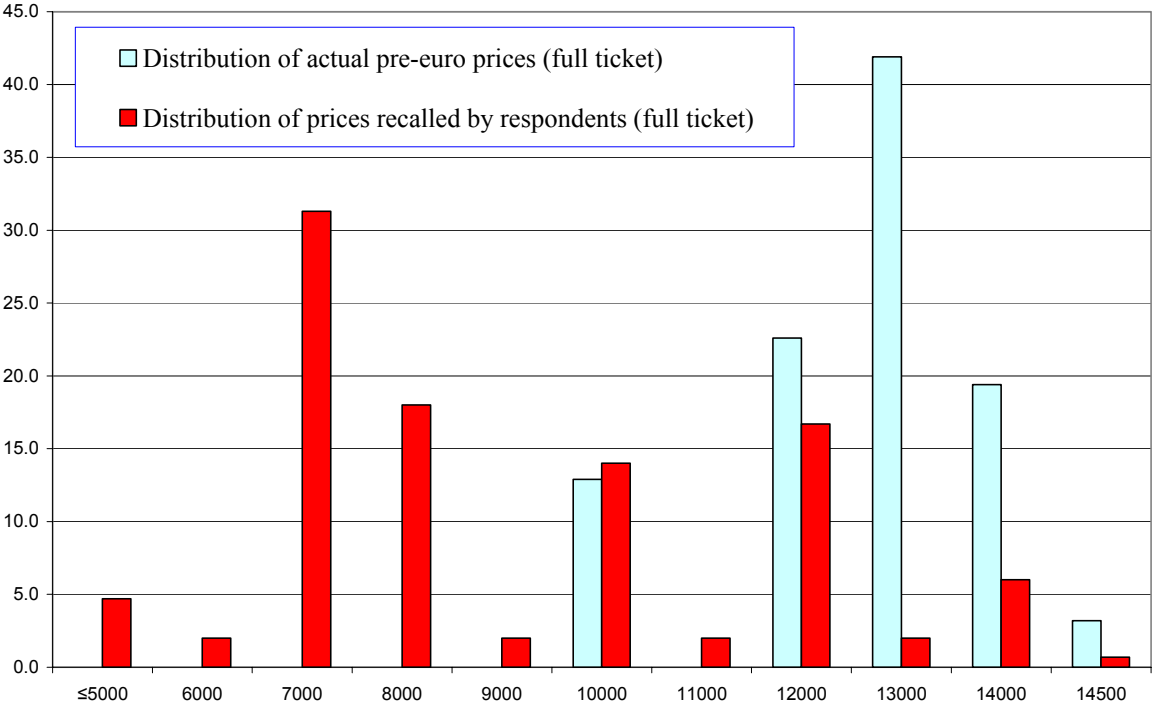
Note: The cinemas considered are those located in Rome showing newly released films. Source: *La Repubblica* daily newspaper.

The findings obtained for the reduced price are similar (Figure 2). Only a very small fraction of the respondents (8 per cent, as in the case of the full price) recall the actual price (8,000 lire). Around a fifth (21 per cent) recall a price (7,000 or 7,500) that is not too far off. Most respondents (61.1 per cent) recall a price (6,000 lire or less) that is much lower than the

actual price. The mean of the recalled price is 5,500 lire. As in the case of the full price, the mode of the recalled price (5,000 lire) corresponds to the mode of the actual prices at the time of the study (5 euro) converted at a rate of 1,000 lire to 1 euro.

Figure 2. Recalled vs. actual cinema prices (reduced ticket)

On the horizontal axis, the prices of reduced cinema tickets (in lire); on the vertical axis, the percentage of respondents indicating the price as their recall (dark histogram) and the percentage of cinemas that charged that price in December 2001 (light histogram).
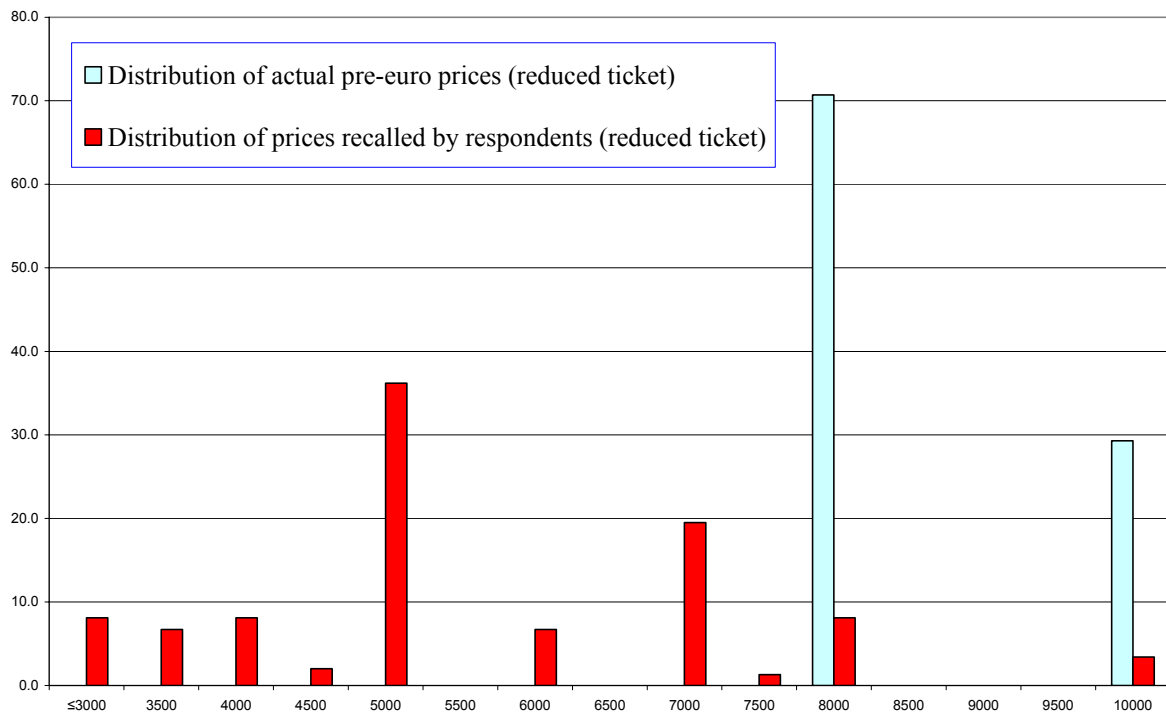
Note: The few cinemas that did not offer a reduced price on Wednesday were excluded from the computation. Source: *La Repubblica* daily newspaper.

Finally, the prices recalled date back to a period long before the changeover: as shown in Figure 3, the mean and the mode of the recalled prices (full ticket) correspond to the actual prices observed, respectively, in 1990 and 1987, more than ten years before the launch of the euro.

8

Figure 3. Recalled pre-euro prices compared to actual prices in historical perspective

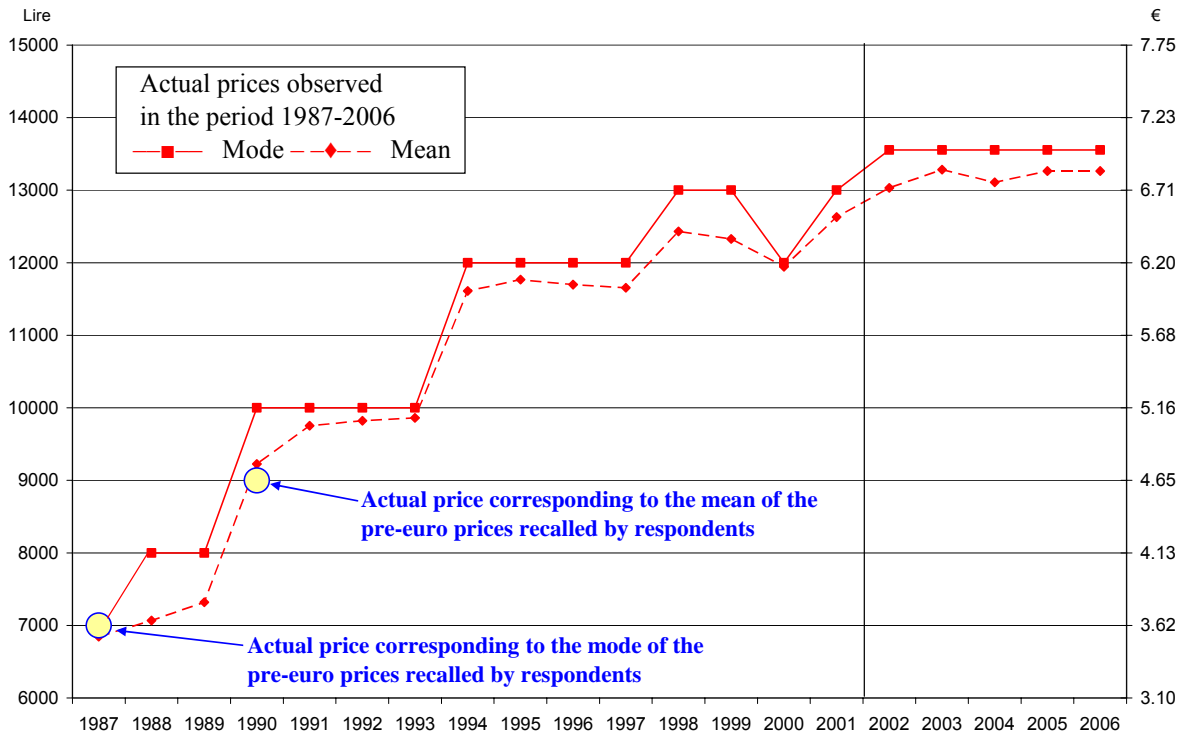Actual cinema prices over the last twenty years (left-hand scale: lire; right-hand scale: euros). The two circles indicate the actual prices corresponding to the mean and the mode of the pre-euro prices recalled by respondents.

Note: Actual prices are those charged for a full ticket by first-run movie theatres in Rome (source: *La Repubblica*). End-of-year figures (first half of December for 2001, see Section 2.3) with the exception of 2006, for which they refer to May 2006, when we carried out the study.

3.2 Memory inaccuracy: some insights from the respondents' answers

Complete descriptive evidence on the relationship between the price recalled by the respondents and their answers to the other questions is given in Table A1 in Appendix 2.

The results of the statistical analyses for the relation between the recall of full prices and the answers relating to individual memory (reported precision of recall and memory of the changeover year), individual habits concerning mental conversion into lire and frequency of movie-going are given in Table 2. The main findings are:[6]

- no significant difference between the prices indicated by respondents claiming precise recall and by participants having a vague memory;[7]

- participants who correctly indicate 2002 as the year of the euro cash changeover have more accurate memory than those who get the year wrong;[8]

---

[6] The same tests were conducted for the reduced price, yielding a similar pattern of results.

[7] Participants were requested first to say whether their price assessment was a recall of the old lira price or a mental calculation starting from the present euro price. Only respondents who reported the former (95 per cent) were asked to indicate the precision of their own recall.

[8] Almost half the respondents (47 per cent; Table A1) report the correct year. A third (33 per cent) indicate 2001, which is not surprising, considering that in 2001 the media and the public already paid a lot of attention to the impending introduction of euro banknotes and coins. Note that the respondents who have an incorrect memory of the year are implicitly recalling a pre-euro price that goes back to an earlier or (in a few cases) a later period than the end of 2001. We kept this in mind in the analyses below.

- the price reported by participants who say that they "always think in euro" or "convert rarely" is significantly higher (and thus more accurate) than that recalled by those who say they "convert sometimes", "often" or "always";[9]
- the price recalled by participants who went to the movies twice a month or more is significantly higher than for participants who attended the cinema once a month or less.

Table 2. Price recalled and respondents' answers relating to individual memory, habits of mental conversion and frequency of movie-going

For each group, number of respondents and mean and standard deviation of the price recalled. For each comparison, t-test of difference between means.

	Reported precision of recall	
	Precise	Vague
N	*52*	*80*
Mean (SD)	9173 (2849)	9125 (2340)
T-test	t(130) = 0.10, not significant	
	Reported year of the euro cash changeover	
	Correct year	Mistaken year
N	*68*	*78*
Mean (SD)	9419 (2541)	8564 (2552)
T-test	t(144) = 1.81, p < 0.10	
	Habits of mental conversion in lire	
	Answers "always think in euro" or "convert rarely"	Answers "convert sometimes", "often" or "always"
N	*72*	*77*
Mean (SD)	9417 (2659)	8591 (2399)
T-test	t(147) = 1.99, p < 0.05	
	Frequency of movie-going	
	Twice a month or more	Once a month or less
N	*85*	*65*
Mean (SD)	9406 (2527)	8462 (2487)
T-test	t(148) = 2.29, p < 0.05	

Note: Number of subjects and degrees of freedom vary depending on the number of missing answers.

3.3 Recall of prices and inflation perceptions

The descriptive statistics (Table A1) suggest a link between the recalled price and individual inflation perceptions (measured by the opinion on the rate of change of the general price level), both in the two years following the changeover and in the two years preceding

---

[9] This relationship, however, is no longer significant once we consider it in the context of a multivariate analysis (see Section 3.7).

the study.[10] However, no statistical test could be conducted on the first period due to the extremely asymmetrical distribution of the answers (only 12 respondents answered "fallen", "stayed about the same" or "risen slightly").

The statistical analysis was thus conducted by grouping subjects according to their opinion on inflation both in the two years after the changeover and in the two years preceding the study, according to two criteria.

a) Responses (fallen, stayed about the same, risen slightly, risen moderately, risen a lot) were assigned scores from 1 to 5 and the scores for the two different periods were summed (e.g., a score of 10 corresponds to "risen a lot" for both periods). The sum of the two periods thus corresponds to the time horizon for which we tested memory for prices.

b) Responses were assigned scores from 1 to 5 and the score for the more recent period was subtracted from that for the two years following the changeover, to capture the persistence of individuals' beliefs concerning inflation.

The scores thus obtained ranged, respectively, from 5 to 10 and from -4 to 3. They were distributed as reported in Table 3.

Table 3. Perceived increase in the general price level

Measures of the respondents' opinion concerning the average change in prices. Responses (fallen, stayed about the same, risen slightly, risen moderately, risen a lot), respectively for the two years following the euro cash changeover and for the two years before the study, were assigned scores from 1 to 5. The sum for the two periods was calculated and also the difference between the post-changeover period and the more recent two-year period. The table shows the number of respondents for each combined score.

Combined score (sum)	2	3	4	5	6	7	8	9	10
N	–	–	–	2	8	13	53	32	40
Combined score (difference)	-4	-3	-2	-1	0	1	2	3	4
N	1	1	4	11	67	30	29	5	–

The statistical analysis (Table 4) shows that movie prices recalled by participants who indicate low inflation over the entire period are significantly higher than those reported by participants with a high level of perceived inflation, especially when "high perceived inflation" is defined as a combined score of 10 (i.e. "risen a lot" both in the two years following the changeover and the last two years). And the prices recalled by participants who perceived the same degree of price increase for both periods are significantly lower (and thus further from the actual price) than for participants who perceived lower inflation in the more recent period than in the two years following the changeover.

---

[10] Although referred to longer time horizons, the questions were phrased as in the European Commission survey, with the same list of possible answers. As in the EC survey, respondents were asked to state their views regarding past price developments in qualitative terms, rather than to make a numerical estimate.

Table 4. Price recalled and inflation perceptions

Relationship between the pre-euro price recalled and the respondents' inflation perceptions (based on the combined scores reported in Table 3) and agreement with the statement "1 euro = 1,000 lire". For each group, number of respondents and mean and standard deviation of the price recalled. For each comparison, t-test of difference between means.

	Inflation perceptions **(sum of scores for the entire post-changeover period)**	
	Low perceived inflation (combined scores from 5 to 8)	High perceived inflation (combined scores from 9 to 10)
N	76	72
Mean (SD)	9388 (2524)	8597 (2544)
T-test	t(146) = 1.90, p < 0.10	
	Low perceived inflation (combined scores from 5 to 9)	High perceived inflation (combined score of 10)
N	108	40
Mean (SD)	9310 (2455)	8175 (2671)
T-test	t(146) = 2.35, p < 0.05	
	Persistence of inflation perceptions **(difference between scores for the two periods considered)**	
	Unchanged perceived inflation (0 rating)	Lower perceived inflation in the more recent period (ratings from of 1 to 3)
N	67	64
Mean (SD)	8493 (2683)	9461 (2493)
T-test	t(129) = 2.14, p < 0.05	
	Agreement with the statement **"What cost 1,000 lire before the introduction of the euro now costs 1 euro"**	
	Strong agreement	All others
N	68	82
Mean (SD)	8602 (2622)	9223 (2449)
T-test	t(148) = 1.73, p < 0.10	

Opinions on inflation were also investigated by asking for the degree of agreement with the statement "What cost 1,000 lire before the introduction of the euro now costs 1 euro", which is apparently what many Italian consumers believe (implying a price rise of practically 100 per cent). The results do not provide clear indications. They do confirm that this opinion is widely spread, almost half of the respondents (45 per cent) strongly agreeing. And these respondents recall a price that is lower than that recalled, on average, by all the others (Table 4). On the other hand, we obtained the unexpected result that the median and the mode of the prices recalled are the same for those who strongly agree with the statement and for the few respondents who strongly disagree (Table A1). Moreover, in multivariate analysis the relationship between the price recalled and the answers to this specific question is not significant (see Section 3.7).

As to the expected effects of the euro introduction on prices, while the participants who said that they had expected a very strong increase recalled a much lower price, this could not be tested statistically since only 10 subjects belong to this category (Table A1). The vast majority (125 out of 138) report that they had expected no change or a moderate increase and recall very similar prices. The prices recalled are slightly lower for subjects whose opinion on the overall effect of the euro for Italy ranges from very disadvantageous to neutral than for those who believe it to have been rather or very advantageous (Table A1). But the difference is not statistically significant: t (140) = 0.84.

3.4 Price recall and age

We divided participants into 3 age groups: age 19-34, 35-50 and 51-65 (Table 5).

Table 5. Price recalled and age

Pre-euro price recalled and age of respondents. For each age group, number of respondents, mean and standard deviation of age, mean and standard deviation of price recalled.

		Age 19-34	Age 35-50	Age 51-65
Age	*N*	*25*	*86*	*34*
	mean (SD)	28.84 (4.55)	41.50 (4.65)	57.65 (3.16)
Price recalled	mean (SD)	10080 (2344)	9006 (2504)	8176 (2528)

The analysis of variance (ANOVA) showed a significant effect of age on the accuracy of price recall ($F_{(2,144)} = 4.23$, $p < 0.05$). A post hoc test (Scheffe multiple comparison) indicated that respondents aged 51 to 65 recall prices that are significantly lower (and thus more inaccurate) than the 19-34 age group ($p < 0.05$), while the difference between the price recall of the intermediate age group and that of the other two groups was not significant.

No significant differences were found on price recalled according to gender, occupational status and level of education. On education, however, the sample is strongly concentrated at a high level (see Section 2.1).

3.5 Expressing the recalled price in euro

The findings obtained by giving a questionnaire in which respondents were asked to indicate the pre-euro price in euro rather than in lire are summarised in Table 6, where answers expressed in euros are also presented converted in lire to make them comparable with the answers to the standard questionnaire. In doing this we used both the official conversion rate of 1,936.27 lire to the euro and the approximate rate of 2,000 to 1 that Italians use in mental conversions. The answers were compared to the answers expressed in lire by considering, for the latter, only the 46 questionnaires administered in the same movie theatre and on the same evenings. The respondents who were asked to express the pre-euro price in euros had a slightly better recall: the mean recalled price is 4.73 euros, which corresponds to about 9,200 or 9,500 lire depending on the conversion rate, against about 8,900 lire when the price is expressed in lire. But the difference is not statistically significant (t(84) = 0.53, and t(84) = 1.09, respectively).

3.6 Recalling the 2003 price

The prices recalled for 2003 are reported in Table 6. The analysis of variance (ANOVA) showed that the type of price requested (pre-euro price in lire, pre-euro price in euro, or price in 2003) had a significant effect on accuracy (measured by the percentage difference between the mean recalled price and the corresponding actual price): $F(2,118) = 4.97$, $p < 0.01$. A post hoc test (Scheffe multiple comparison) indicated that the memory error for the 2003 price was smaller than for the pre-euro price in lire ($p < 0.05$) and, though less significantly, for the pre-euro price in euro ($p < 0.10$). Although closer to the actual price than for the pre-euro period, the prices recalled for 2003 are still significantly lower than the actual prices ($t(33) = 5.93$, $p < 0.01$). The mode of the prices recalled is 27 per cent lower than the actual price.

The respondents' memory for 2003 implies a perceived rate of increase in cinema prices of about 8 per cent on an annual basis in the 2003-06 period, while in reality prices were virtually unchanged. This distortion was somewhat less than the corresponding bias for the previous part of the sample period (from the changeover to 2003), for which respondents' recall of pre-euro prices implied an upward bias of about 11 per cent a year (the difference between a perceived implicit rate of increase of 13 per cent and an actual rate of about 2 per cent between December 2001 and mid-2003).[11]

---

[11] We divided the period between the changeover and May 2006, when we carried out the study, into two sub-periods: from the launch to mid-2003 and from mid-2003 to May 2006. We considered mid-2003 rather the end of the year because respondents were requested to indicate generically the price "in 2003". In estimating the implicit rates of price increase we kept in mind that some respondents did not correctly remember the year of the euro cash changeover (see Section 3.2), so in annualizing we considered time horizons of varying length, according to the year recalled. The estimate of the implicit rate in the latter period is based on a comparison between the price recalled for 2003 and the actual price observed in May 2006; if respondents had an imperfect knowledge of the current price the rate of increase implicit in their perception would differ correspondingly from our estimate (respondents were not asked to indicate the current price, since it was posted at the box office and easily readable).

Table 6 - Types of price recall: pre-euro price expressed in lire or euros; 2003 price

Answers obtained by giving to three different groups of respondents one of three questionnaires in which respondents were asked to indicate, respectively, the pre-euro price expressed in lire (standard questionnaire), the pre-euro price expressed in euros, or the 2003 price. For comparison, answers expressed in euros are also presented converted in lire, both at the official conversion rate and at the approximate "mental" conversion rate of 2,000 lire to 1 euro. The answers expressed in euros are compared with those expressed in lire by considering, for the latter, only the 46 questionnaires administered in the same movie theatre and on the same evenings.

		Pre-euro price recalled in lire	Pre-euro price recalled in euro			Recalled 2003 price		
			€	lira equivalent [1]	lira equivalent [2]	€	lira equivalent [1]	lira equivalent [2]
		(n = 46)	(n = 41)			(n = 35)		
	mean	8870	4.73	9159	9460	5.67	10979	11340
full	median	8000	5.00	9681	10000	6.00	11618	12000
	mode	7000	5.00	9681	10000	5.00	9681	10000
	SD	2475	1.23	2382	2460	1.09	2111	2180
		(n = 45)	(n = 37)			(n = 35)		
	mean	5622	3.10	6002	6200	3.71	7184	7420
reduced	median	5000	3.00	5809	6000	3.50	6777	7000
	mode	5000	2.50	4841	5000	3.00	5809	6000
	SD	1819	1.04	2014	2080	0.92	1781	1840

(1) Price in euros converted into lire at the official conversion rate of 1 euro to 1,936.27 lire.
(2) Price in euros converted into lire at the approximate conversion rate of 1 euro to 2,000 lire

3.7 Regression analysis

As a synthesis of the relationships between the price recalled and the other variables, and to test which variables remain significant when they are considered simultaneously, Table 7 reports the results of linear regressions of the pre-euro price recalled for the full cinema ticket against a set of variables derived from the other questions. Given that the pre-euro price recalled did not differ significantly with the currency in which it was expressed, we considered both the answers to the standard questionnaire (pre-euro price recalled in lire) and those to the alternative questionnaire (pre-euro price recalled in euros). In any case, a dummy variable to control for the possible influence of the currency was also included.[12] All the coefficients have the expected signs. Among the variables that were significantly related to the correctness of recall according to the bivariate analysis (Section 3.2), the coefficients of frequency of movie-going and of perceived inflation – considering either the two years following the changeover or the combined score variable that sums the responses for the two periods – are both significantly different from zero. The coefficient of age is also significantly different from zero, while the coefficient of agreement with the statement "1 euro = 1,000 lire" and of the habits on conversion are not significantly different from zero. For the latter variable, this probably reflects a correlation with age. Older respondents, whose recall is less accurate, are more inclined to mental conversion than younger participants (a significant correlation, r (145) = 0.20 p < 0.05, was found between age and reported habits on mental conversion). The coefficient for the euro/lire dummy variable is not significantly different from zero, confirming the results reported in Section 3.5.[13]

4. Discussion

The main results described in Section 3 show that most participants had highly inaccurate memory of pre-euro prices in lire. An overwhelming majority indicated prices for the full ticket that were non-existent or in effect in just a few cinemas in the months preceding the launch of the euro, while very few respondents reported prices that can be deemed correct. The prices recalled date to a period long before the changeover – as far back as 1987, in fact. The results for the reduced price were similar, which is particularly interesting considering that this price had been unvaried for almost four years at the moment of the changeover.

Overall these results suggest that the consumers' common claim that they can properly compare present and pre-euro prices is likely to be less than well-founded. This conclusion is strengthened by our finding that the accuracy of price recall is no better among respondents who claim a precise recall than among those who claim only a vague memory. Many consumers, one could conclude, cannot judge the actual precision of their price recall and are overconfident about its quality.

---

[12] Each variable was assigned a value from 1 and 5 (or 6) according to the sequence of possible answers to the respective question, as reported in Table A1. The exceptions are the regressors "age", included as collected in the questionnaire, and "recall for the year of the euro launch", which takes value 0 or 1 depending on whether the answer is wrong or right (assigning to this variable a score that depends on the difference between the answer and 2002 yields similar results). A dummy variable is included for the currency in which prices are recalled (lire or euros).

[13] As a robustness test, and to capture possible nonlinear relationships, we also ran the regression with an alternative coding of the answers, i.e. 5 (or 6) dummy variables for each question, corresponding to the alternative answers to that question. The results were in line with those reported in Table 7: the coefficients were significantly different from zero only for some of the answers relating to frequency of movie-going, inflation perceptions and age.

Table 7. Summary regressions - dependent variable: recalled price for cinema tickets before the euro cash changeover (1)

Regression of recalled pre-euro cinema prices on other variables derived from the answers to the questionnaire, each variable being assigned a value from 1 to 5 (or 6) according to the sequence of possible answers, as reported in Table A1. The only exceptions are the regressors *age*, included as collected in the questionnaire, and *recall of the year of the euro launch*, which takes 0 for a wrong answer and 1 for right (results assigning a score that depends on the difference between the answer and 2002 are similar). A dummy variable is included for the currency in which prices are recalled (lire or euros). *, ** and *** indicate statistical significance at respectively 0.10, 0.05 and 0.01 levels.

	(1)	(2)	(3)	(4)	(5)	(6)
Recall for the year of the euro launch	0.106	0.107	0.096	0.100	0.107	
	t = 1.380	t = 1.401	t = 1.250	t = 1.255	t = 1.361	
	p = 0.169	p = 0.163	p = 0.213	p = 0.211	p = 0.176	
Frequency of cinema attendance	0.136*	0.141 *	0.141 *	0.162 **	0.153 *	0.166**
	t = 1.738	t = 1.815	t = 1.826	t = 1.982	t = 1.898	t = 2.285
	p = 0.084	p = 0.071	p = 0.070	p = 0.049	p = 0.060	p = 0.024
Mental conversion	-0.109	-0.106	-0.091	-0.093	-0.056	
	t = -1.444	t = -1.416	t = -1.215	t = -1.184	t = -0.710	
	p = 0.151	p = 0.159	p = 0.226	p = 0.238	p = 0.479	
Currency of response (lire/euro)	-0.001	-0.015	-0.016	-0.024	-0.032	
	t = -0.013	t = -0.207	t = -0.219	t = -0.310	t = -0.414	
	p = 0.990	p = 0.837	p = 0.827	p = 0.757	p = 0.679	
Inflation perception (2 years following the changeover)		-0.135 *				
		t = -1.814				
		p = 0.071				
Inflation perception (2 years following the changeover + last 2 years)			-0.153 **	-0.135 *	-0.140 *	-0.172**
			t = -2.043	t = -1.706	t = -1.792	t = -2.383
			p = 0.043	p = 0.090	p = 0.075	p = 0.018
Conversion 1000 lire = 1 euro				-0.003	-0.025	
				t = -0.037	t = -0.326	
				p = 0.970	p = 0.745	
Expectations				-0.092	-0.077	
				t = -1.158	t = -0.990	
				p = 0.248	p = 0.324	
General opinion on euro adoption				0.063	0.095	
				t = 0.814	t = 1.223	
				p = 0.417	p = 0.223	
Age					-0.197 **	-0.189***
					t = -2.509	t = -2.601
					p = 0.013	p = 0.010
R-squared	0.053	0.071	0.076	0.088	0.124	0.096
Adjusted R-squared	0.031	0.044	0.049	0.041	0.073	0.080

The distorted memory of the pre-euro price cannot apparently be ascribed simply to the length of time that has passed, since memory for prices in 2003 is also quite poor. This suggests that the difficulty in retrieving prices from the past is not specific to the changeover period, although in this case the difference between memory and reality is somewhat smaller than for the pre-euro price. We are planning a study in an EU country that has not adopted the euro, to test price memory over the same span of time unaffected by the currency changeover.

The results from the alternative questionnaire indicate that asking respondents to express the pre-euro price in euros rather than in lire was not enough to stimulate them to compare their answer to the present price and reflect better on the variation implied by the recalled price.

The great discrepancy between the cinema prices recalled and the prices actually in effect before the launch of the euro suggests, prima facie, that poor memory could be a relevant factor in explaining individual inflation perceptions. In our study, the recall for the pre-euro period would imply a 50 to 90 per cent rise in cinema prices (depending on whether we consider the mean or the mode) over four and a half years, as against the actual increase of about 5 per cent.

There is a relationship between the price recalled and the general inflation perception (the individual's opinion on the rate of change of the aggregate price level): respondents who perceive higher and more persistent inflation had on average a more inaccurate recall of pre-euro cinema prices.

However, these results must be interpreted with caution. In the first place, the study was conducted in 2006, while the leap in inflation perceptions, in Italy as in other euro-area countries, came in the two years immediately following the changeover. Although we asked separate questions for the post-changeover period and for the more recent period, we are aware that retrospective answers require very careful interpretation. Moreover, it would be hazardous to draw general conclusions on the relation between the individual perception about inflation (i.e. the rate of change in the aggregate price level) and individual price memory from the recalled price of a single item. More evidence is needed, and we plan to conduct further analysis on a range of products and different time spans.

An interesting finding is that the mode of the price recalled – 7,000 lire for the full price and 5,000 lire for the reduced price – corresponds to the mode of the prices prevailing when we conducted the study (7 and 5 euros, respectively) converted at a rate of 1,000 lire. This result suggests the possibility of a back-causation from the fairly widespread conviction that most prices have been converted at a rate of 1,000 lire to 1 euro to the "recall" of a price in lire that corresponds to that belief. Yet, the answers to the question that investigates this belief directly – asking whether the respondent agrees with the statement "What cost 1,000 lire before the introduction of the euro now costs 1 euro" – do not provide a clear indication in this regard. They do show that this opinion is widely shared, and respondents who strongly agree with the statement recall a price that is lower than that recalled, on average, by the other participants. But in multivariate analysis the correlation between the price recalled and the answer to this specific question is not significant. Moreover, unexpectedly, the mode of the price recalled is the same (7,000 lire) for those who strongly agree with the statement and for the few respondents who strongly disagree. While this recall of the pre-euro price – though completely wrong – is perfectly consistent with the belief of the former group, it is difficult indeed to reconcile with the belief of the latter. This inconsistency might be explained to some extent by the fact that we asked participants to express their agreement with a general statement while the memory for prices is measured for the price of cinema tickets only. In principle, we cannot exclude that some respondents considered the statement to be false in

general, but with some exceptions including the price of cinema. However, this result might also suggest difficulty for some respondents in relating the memory for single prices and the assessment on the rate of change of these prices, or more generally of the rate of change of the overall price level.

Another relevant result, in the light of the literature briefly discussed in the Introduction, is that the accuracy of price recall is significantly affected by the frequency of cinema attendance. This suggests that the more frequently they buy items, the better is consumers' memory for prices. This in turn is consistent with the empirical evidence that inflation perceptions are affected disproportionately by the price rises of the goods that are purchased most frequently.

The finding of no significant relationship between prices recalled and attitudes toward the euro (considering both the expectations for prices and the present opinion on the overall effect of the euro for Italy) suggests that these factors did not count much in orienting the memory of prices.[14]

The relationship between age and price recall is consistent with the existing literature, showing a progressive age-related decline in various systems of memory (Craik *et al.* 1990, Cockburn and Smith 1991, Baddeley 1999). In this regard, an interesting study is Aalto-Setala and Raijas (2003), showing a decline in the ability to estimate prices after the euro changeover among Finnish consumers aged above fifty years.

Finally, while explaining such very bad price memory is beyond the scope of this paper, some possible explanations, in addition to the specific factors considered so far, can be usefully discussed on the basis of the cognitive literature on memory.[15]

One possible explanation of incorrect recall is that the price was not encoded (i.e. stored in memory for later retrieval) in the first place. Price knowledge surveys conducted in stores show a surprisingly low level of price knowledge. Dickson and Sawyer (1990) found that only 56 per cent of the respondents knew the price of an item they had just placed in their shopping cart.

Alternatively, the price could have been encoded but no longer present in the subject's long-term memory. The trace could have been removed by proactive inhibition (earlier memories supplanting more recent ones; Underwood 1957) or retroactive interference (forgetting old information due to new information; McGeoch and McDonald 1931, Slamecka 1960). Due to price variation both in time and across locations and sales points, interference is clearly at work on most prices. In our case of cinema tickets, this effect should not be large, as prices were quite stable both in the years preceding the changeover and in the following years and also quite uniform (on 8 December 2001 only four different prices were charged by at least 10 per cent of movie theatres; Figure 1). However, as noted above, the mode of the recalled prices in lire and that of the prices in euro prevailing at the time of the study have a feature in common, namely the prominence of the number 7 for the full ticket and of the number 5 for the reduced one. Therefore, we cannot rule out retroactive interference of the

---

[14] Naturally, participants' accounts of the expectations they had had before the launch of the euro is subject to the standard objections to all retrospective answers. However, the answers in this study are as a whole consistent with the results of the consumer surveys conducted before the changeover (European Commission 2001), according to which the expectation of strong price increases was less common in Italy than in other euro-area countries, in particular Germany (the country considered by Traut-Mattausch *et al.* 2004).

[15] This discussion takes into account the interdisciplinary character of the paper and the wide interest in the questions it treats. We have therefore tried to minimize or explain specialized language, so as to make this section accessible to both economists and psychologists and, as far as possible, to laymen.

price of the cinema ticket in euro at the time of the survey (7 and 5 euros) with the price recalled (7,000 and 5,000 lire).

A third possibility is that the price is still stored in long-term memory but for some reason cannot be retrieved. A lack of contextual information might explain the difficulty in retrieving the correct price (Tulving 1983), although, following Vanhuele and Drèze (2002), the test was conducted inside movie theatres in order to maximise contextual cues.

Lastly, given that prices have different types of representation in memory (Dehaene 1992 classifies them as auditory verbal code, visual Arabic code, and approximate quantities on a dimension termed number line), one could argue that price recall was influenced by the way in which we have measured price knowledge (see Monroe, Powell and Choudhury 1986). However, most studies investigating memory for price information have focused on recall and this is the main reason why we chose this for the present study. Recall was used instead of recognition also to avoid providing respondents with any information regarding the magnitude of prices in the period considered.

Further research, possibly including experimental work, will help elucidate which of the above memory mechanisms may best explain our results.

5. Summary and conclusions

This study investigated the memory for pre-euro cinema prices, submitting questionnaires to members of the public in movie theatres in Rome. The results show that the prices recalled are much lower than the actual prices that were in effect before the euro cash changeover. In the case of the full ticket, the mode and the mean are 7,000 and 9,000 lire, respectively, compared to the actual price in December 2001 of 13,000 lire at most theatres in Rome. The prices recalled date to a period long before the changeover, indeed as early as 1987. Similar results are obtained for the price of the reduced ticket offered on Wednesdays by most theatres: the mode of the price recalled is 5,000 lire, compared to the actual price of 8,000 lire, which is particularly striking considering that at the time of the changeover this price had been unchanged for almost four years.

Overall, the results suggest that people have highly distorted memories for prices and that the claim of many consumers that they can properly compare present prices with those in being before the introduction of the euro is likely to be less well-founded than they may believe. This conclusion is strengthened by our finding that the quality of price recall is not better for respondents claiming precise recall than for those admitting to having a vague memory, which suggests that many respondents are unaware of the real degree of accuracy of their price recall and overconfident about its quality.

It appears that the distorted memory for the price in 2001 cannot be ascribed simply to amount of time that has elapsed, since memory for the 2003 prices also appears to be quite poor. The results on the 2003 price suggest that the respondents' difficulty in retrieving prices is not specific to the changeover period, although the difference between the price recalled and the actual price is smaller than for the pre-euro price.

A significant relationship is found between the price recalled and subjects' individual inflation perceptions, measured by the assessments of the rate of change of the general price level in the two years following the changeover and in the two years preceding the study. Price recall is less accurate for those who perceive higher and more persistent inflation.

An interesting result is that the mode of the pre-euro price recalled for both full and reduced tickets corresponds to the actual prices at the time of the study (7 and 5 euros

respectively) converted at a rate of 1,000 lire to 1 euro (compared to the official conversion rate of almost 2,000 lire). While this suggests the possibility of a back-causation from the belief that most prices were converted at that rate to a consequent "recall", the answers to the question specifically investigating that belief do not provide clear indications in this regard.

Finally, price recall is more inaccurate for older respondents, and improves with the frequency of movie-going. The latter result is consistent with the hypothesis that consumers have a better memory for prices the more frequently they buy an item and with the empirical evidence that inflation perceptions are disproportionately affected by the prices of the products that are bought most frequently.

All in all, this paper provides a neat case study. A caveat, however, is essential. While the choice of the item and the size and composition of the sample are appropriate for the objective of the paper, excessive generalization in interpreting the results is unwarranted. In particular, although we find a relationship between the inaccuracy of price recall and individual opinions on inflation, we do not claim that this alone explains the Italian consumers' perception of a surge in inflation following the cash changeover, because of the long time between that event and the study and the fact that only a single price is considered. Nor do we believe that our results imply that the perception of a process of impoverishment on the part of some categories of consumers is due only to inaccurate memory for past prices or other psychological factors, as the perception may also reflect real factors affecting one's economic situation – not necessarily related to consumer price inflation but hard to distinguish from it – such as large price increases in items not included or only partially covered in the official index (owner-occupied housing being the main example), modest average increases in real incomes and distributive changes across socio-economic groups, as argued by Boeri and Brandolini (2004) and Del Giovane and Sabbatini (2006).

Appendix 1: Standard Questionnaire (English translation)

1) Could you tell us what was the price in Lire for the full cinema ticket (in a movie theatre showing newly released movies similar to this one) in the period immediately preceding the euro cash changeover?

<div align="center">Price in Lire:…………………………..</div>

2) What was the price for the reduced ticket in that period (Wednesday evening)?

<div align="center">Price in Lire:…………………………..</div>

3) Your answers are yielded from:

- ☐   A recall of the old price in lire
- ☐   A mental calculation based upon the present price in euro
- ☐   Other (please specify)………………………………….

4) If your answers were based upon a recall of the price in lire, please specify which type of recall:

- ☐   A precise recall of the price
- ☐   A precise recall linked to an action (for instance taking the money from your wallet)
- ☐   A precise recall linked to a specific event
- ☐   A vague memory
- ☐   Other (please specify) ………………………………….

5) Roughly how frequently did you go to the movies in the period preceding the euro cash changeover?

- ☐   Less than once in 2 months
- ☐   Once in 2 months
- ☐   Once a month
- ☐   Twice or three times a month
- ☐   Once a week
- ☐   Twice or more a week

6) How frequently do you go to the movies now?

- ☐   Less than once in 2 months
- ☐   Once in 2 months
- ☐   Once a month
- ☐   Twice or three times a month
- ☐   Once a week
- ☐   Twice or more a week

7) If the frequency with which you go to the movies has increased/decreased between the two periods, what is this change due to? (do not answer unless frequency has changed)

- ☐   Changes in my personal/family situation
- ☐   Changes in my financial position
- ☐   Changes in the cinema ticket price
- ☐   Alternatives to going to the movies (DVD, Pay-TV)
- ☐   Other (please specify) ………………………………….

8) Do you remember at the beginning of which year the euro cash changeover took place?

<div align="center">………………………………….</div>

9) In your opinion, in the 2 years that followed the introduction of the euro banknotes and coins, prices of goods consumed by Italian families have on average:

- ☐ Fallen
- ☐ Stayed about the same
- ☐ Risen slightly
- ☐ Risen moderately
- ☐ Risen a lot
- ☐ Don't know

10) In your opinion, in the last 2 years, prices of goods consumed by Italian families have on average:

- ☐ Fallen
- ☐ Stayed about the same
- ☐ Risen slightly
- ☐ Risen moderately
- ☐ Risen a lot
- ☐ Don't know

11) In your daily shopping how do you do to estimate how much you spend?

- ☐ I always think in euros
- ☐ I rarely convert into lire
- ☐ I sometimes convert into lire
- ☐ I often convert into lire
- ☐ I always convert into lire
- ☐ Don't know

12) Before the euro cash changeover, you expected that the euro would cause:

- ☐ A sharp decrease in prices
- ☐ A moderate decrease in prices
- ☐ Neither an increase nor a decrease in prices
- ☐ A moderate increase in prices
- ☐ A sharp increase in prices
- ☐ Don't know

13) In your opinion, overall for Italy the adoption of the euro has been:

- ☐ Very disadvantageous
- ☐ Rather disadvantageous
- ☐ Neither disadvantageous nor advantageous
- ☐ Rather advantageous
- ☐ Very advantageous
- ☐ Don't know

14) What is your degree of agreement with the statement "What cost 1,000 lire before the introduction of the euro now costs 1 euro"" :

- ☐ Strongly disagree
- ☐ Partially disagree
- ☐ Neither agree nor disagree
- ☐ Partially agree
- ☐ Strongly agree
- ☐ Don't know

Questions on gender, age, education and occupation (not included here) completed the questionnaire

Appendix 2: Descriptive statistics

Table A1

		Precision of recall					
		Precise	Precise, linked to action	Precise, linked to specific event	Vague	Don't know	
		(n=36)	(n=13)	(n=3)	(n=80)	(n=3)	(n=135)
full	mean	9500	7692	11667	9125	7000	9096
	median	9000	8000	11000	8000	7000	8000
	mode	7000	8000	10000	7000	7000	7000
reduced	mean	5819	4538	5000	5663	5000	5567
	median	5000	4000	5000	5000	5000	5000
	mode	5000	3000	5000	5000	4000	5000
		Recall of the year of the euro cash changeover					
		1999	2000	2001	2002	2003	2004
		(n=2)	(n=20)	(n=48)	(n=68)	(n=7)	(n=1)	(n=146)
full	mean	6500	8700	8917	9419	7571	7000	9010
	median	6500	8000	8000	9000	7000	7000	8000
	mode	6000	7000	7000	7000	7000	7000	7000
reduced	mean	4000	5225	5365	5799	5429	4000	5521
	median	4000	5000	5000	5000	5000	4000	5000
	mode	3000	5000	5000	5000	5000	4000	5000
		Habits on mental conversion to lire					
		Always think in euro	Convert Rarely	Convert sometimes	Convert often	Convert always	
		(f=50)	(f=22)	(f=38)	(f=32)	(f=7)	(f=149)
full	mean	9360	9545	8526	8703	8429	8990
	median	8500	10000	8000	8000	7000	8000
	mode	7000	7000	7000	7000	7000	7000
reduced	mean	5740	5932	5184	5452	4857	5524
	median	5000	5500	5000	5000	5000	5000
	mode	5000	5000	5000	5000	4000	5000
		Frequency of movie-going before the euro					
		Less than once in 2 months	Once in 2 months	Once a month	2-3 times a month	Once a week	Twice or more a week
		(n=15)	(n=15)	(n=35)	(n=54)	(n=25)	(n=6)	(n=150)
full	mean	8667	8200	8486	9176	9440	11333	8997
	median	7000	7000	8000	8000	10000	12500	8000
	mode	7000	7000	7000	7000	10000	14000	7000
reduced	mean	5267	5214	5329	5620	5700	6667	5534
	median	5000	5000	5000	5000	5000	7000	5000
	mode	3000	5000	5000	5000	5000	5000	5000
		Perceived change in prices in the two years following the changeover					
Price		Fallen	Stayed about the same	Risen slightly	Risen moderately	Risen a lot	Total
		(n=1)	(n=3)	(n=8)	(n=46)	(n=92)	(n=150)
full	mean	12000	10667	9500	8957	8886	8997
	median	12000	10000	10000	8000	8000	8000
	mode	12000	10000	10000	8000	7000	7000
reduced	mean	6000	8000	5688	5344	5527	5534
	median	6000	7000	5500	5000	5000	5000
	mode	6000	7000	5000	5000	5000	5000

		Perceived change in prices in the last two years					
		Fallen (n=0)	Stayed about the same (n=11)	Risen slightly (n=33)	Risen moderately (n=49)	Risen a lot (n=55)	(n=148)
full	mean	-	9091	9682	9143	8455	9003
	median	-	8000	10000	8000	7500	8000
	mode	-	7000	12000	7000	7000	7000
reduced	mean	-	5318	5939	5646	5164	5507
	median	-	5000	7000	5000	5000	5000
	mode	-	5000	7000	5000	5000	5000

		Degree of agreement with the statement "1,000 lire equal to 1 euro"					
		Strongly disagree (n=22)	Partially disagree (n=8)	Neither agree nor disagree (n=5)	Partially agree (n=47)	Strongly agree (n=68)	(n=150)
full	mean	8841	9125	11600	9340	8603	8997
	median	8000	9000	12000	10000	8000	8000
	mode	7000	7000	12000	7000	7000	7000
reduced	mean	5114	5875	7600	5745	5328	5534
	median	5000	5500	7000	5000	5000	5000
	mode	5000	4000	7000	5000	5000	5000

		Expected effect on prices of the euro introduction					
Recalled Price		Sharp decrease (f=1)	Moderate decrease (f=2)	Neither increase nor decrease (f=80)	Moderate increase (f=45)	Sharp increase (f=10)	Total (f=138)
full	mean	14000	9500	9094	9167	7850	9069
	median	14000	9500	8000	8000	7250	8000
	mode	8000	7000	7000	7000	7000	7000
reduced	mean	8000	6000	5722	5300	4900	5544
	median	8000	6000	5000	5000	5000	5000
	mode	8000	4000	5000	5000	5000	5000

		Opinion on the overall effect of the euro adoption for Italy					
		Very disadvant. (f=18)	Rather disadvant. (f=39)	Neither disadv. nor advant. (f=17)	Rather advant. (f=46)	Very advant. (f=22)	(f=142)
full	mean	8722	8962	8824	9348	9000	9046
	median	8000	8000	8000	8000	8000	8000
	mode	7000	7000	8000	7000	7000	7000
reduced	mean	5639	5303	5265	5902	5591	5582
	median	5000	5000	5000	5000	5500	5000
	mode	5000	5000	5000	5000	5000	5000

References

AALTO-SETALA V. AND RAIJAS A. (2003), Consumer price knowledge before and after the euro changeover, *International Journal of Consumer Studies*, 27, 3, 210-217.

AMERIKS J., CAPLIN A. AND LEAHY (2004), The absent-minded consumer, NBER Working Papers, 10216, January.

AUCREMANNE L. AND COLLIN M. (2005), Is there a discrepancy between measured and perceived inflation in the euro area since the euro cash changeover?, paper presented at the OECD Seminar: Inflation Measures: Too High – Too Low – Internationally Comparable?, Paris, 21-22 June.

BADDELEY A. D. (1999), Essentials of human memory, Psychology Press, Hove.

BOERI T. AND BRANDOLINI A. (2004), The age of discontent: Italian households at the beginning of the decade, *Giornale degli Economisti e Annali di Economia*, 63, 449-487.

COCKBURN J. AND SMITH P.T. (1991), The relative influence of intelligence and age on everyday memory, *Journal of Gerontology: Psychological Sciences*, 46, 31-36.

COHEN G. (1996), Memory in the Real World, Psychology Press, Hove.

CRAIK F.I.M., MORRIS R.G. AND GICK M.L. (1990), Adult age differences in working memory, in Vallar G. and Shallice T. (eds.), Neuropsychological impairments of short-term memory, Cambridge University Press, Cambridge.

DEHAENE S. (1992), Varieties of numerical abilities, *Cognition*, 44, 1-42.

DEL GIOVANE P., LIPPI F. AND SABBATINI R. (2005) (eds.), L'euro e l'inflazione. Percezioni, fatti e analisi, Il Mulino, Bologna.

DEL GIOVANE P. AND SABBATINI R. (2005), The cash changeover: the impact on prices and inflation perceptions in the euro area, mimeo, Italian version in Del Giovane P., Lippi F. and Sabbatini R. (2005).

DEL GIOVANE P. AND SABBATINI R. (2006), Perceived and measured inflation after the launch of the euro: explaining the gap in Italy, *Giornale degli Economisti e Annali di Economia*, 65 (2), 155-192.

DICKSON P.R. AND SAWYER A.G. (1990), The price knowledge and search of supermarket shoppers, *Journal of Marketing*, 54, 42-53.

EHRMANN M. (2006), Rational inattention, inflation developments and perceptions after the euro cash changeover, European Central Bank Working Paper Series, 588, February.

EUROPEAN CENTRAL BANK (2003a), Effects of the introduction of the euro banknotes and coins on consumer prices, *Annual Report 2002*, 40-42.

EUROPEAN CENTRAL BANK (2003b), Recent developments in euro area inflation perceptions, *Monthly Bulletin*, October, 24-25.

EUROPEAN COMMISSION (2001), Euro Attitudes (wave 6) – Euro Zone, *Flash Eurobarometer*, 115.

GAIOTTI E. AND LIPPI F. (2004), Pricing behavior and the introduction of the euro: evidence from a panel of restaurants, *Giornale degli Economisti e Annali di Economia*, 63, 491-526.

KAHNEMAN D. AND TVERSKY A. (1979), Prospect theory: an analysis of decision under risk, *Econometrica*, 47, 263-291.

LEVY D., CHEN H., RAY S. AND BERGEN M. (2006), Asymmetric price adjustment in the small, Bar-Ilan University Economics Working Paper Series, November.

MARQUES J.F. AND DEHAENE S. (2004), Developing intuition for prices in euros: Rescaling or relearning prices?, *Journal of Experimental Psychology: Applied*, 10, 3, 148-155.

MASTROBUONI G. (2004), The effects of the euro-conversion on prices and price perceptions, *CEPS Working Paper*, No. 101, September.

MCGEOCH J.A. AND MCDONALD W.T. (1931), Meaningful relation and retroactive inhibition, *American Journal of Psychology*, 43, 579-588.

MONROE K.B. AND LEE A.Y. (1999), Remembering versus knowing: Issues in buyers' processing of price information, *Journal of the Academy of Marketing Science*, 27(2), 207-255.

MONROE, K.B., POWELL P. AND CHOUDHURY P.K. (1986), Recall versus recognition as a measure of price awareness, in Lutz R. (ed) Advances in Consumer Research, vol. 13.

MULLAINATHAN S. (2002), A memory-based model of bounded rationality, *The Quarterly Journal of Economics*, CXVII, 3, 735-774.

NEISSER U. (1982), (ed.), Memory observed: remembering in natural contexts, San Francisco, CA, Freeman.

REIS R. (2006), Inattentive Consumers, *Journal of Monetary Economics*, 53 (8).

SIMS, C.A. (2003), Implications of rational inattention, *Journal of Monetary Economics*, 50, 665-690.

SLAMECKA N.J. (1960), Retroactive inhibition of connected discourse as a function of practice level, *Journal of Experimental Psychology*, 59, 104-108.

TRAUT-MATTAUSCH E., SCHULZ-HARDT S., GREITEMEYER T. AND FREY D. (2004), Expectancy confirmation in spite of disconfirming evidence: The case of price increases due to the introduction of the Euro, *European Journal of Social Psychology*, Vol. 34, 6, 739-760.

TULVING E. (1983), Elements of episodic memory, Oxford: Oxford University Press.

TVERSKY A. AND KAHNEMAN D. (1974), Judgment under uncertainty: heuristics and biases, *Science*, 185, 1124-1131.

UNDERWOOD B.J. (1957), Interference and forgetting, *Psychological review*, 64, 49-60.

VANHUELE M. AND DRÈZE X. (2002) Measuring the price knowledge shoppers bring to the store, *Journal of Marketing*, 66, 72-85.

RECENTLY PUBLISHED "TEMI" (*)

N. 596 – *Social interactions in high school: Lesson from an earthquake*, by Piero Cipollone and Alfonso Rosolia (September 2006).

N. 597 – *Determinants of long-run regional productivity: The role of R&D, human capital and public infrastructure*, by Raffaello Bronzini and Paolo Piselli (September 2006).

N. 598 – *Overoptimism and lender liability in the consumer credit market*, by Elisabetta Iossa and Giuliana Palumbo (September 2006).

N. 599 – *Bank's riskiness over the business cycle: A panel analysis on Italian intermediaries*, by Mario Quagliariello (september 2006)

N. 600 – *People I know: Workplace networks and job search outcomes*, by Federico Cingano and Alfonso Rosolia (September 2006).

N. 601 – *Bank profitability and the business cycle*, by Ugo Albertazzi and Leonardo Gambacorta (September 2006).

N. 602 – *Scenario based principal component value-at-risk: An application to Italian banks' interest rate risk exposure*, by Roberta Fiori and Simonetta Iannotti (September 2006).

N. 603 – *A dual-regime utility model for poverty analysis*, by Claudia Biancotti (September 2006).

N. 604 – *The political economy of investor protection*, by Pietro Tommasino (December 2006).

N. 605 – *Search in thick markets: Evidence from Italy*, by Sabrina Di Addario (December 2006).

N. 606 – *The transmission of monetary policy shocks from the US to the euro area*, by S. Neri and A. Nobili (December 2006).

N. 607 – *What does a technology shock do? A VAR analysis with model-based sign restrictions*, by L. Dedola and S. Neri (December 2006).

N. 608 – *Merge and compete: Strategic incentives for vertical integration*, by Filippo Vergara Caffarelli (December 2006).

N. 609 – *Real-time determinants of fiscal policies in the euro area: Fiscal rules, cyclical conditions and elections*, by Roberto Golinelli and Sandro Momigliano (December 2006).

N. 610 – *L'under-reporting della ricchezza finanziaria nell'indagine sui bilanci delle famiglie, by* Leandro D'Aurizio, Ivan Faiella, Stefano Iezzi, Andrea Neri (December 2006).

N. 611 – *La polarizzazione territoriale del prodotto pro capite: un'analisi del caso italiano sulla base di dati provinciali* by Stefano Iezzi (December 2006).

N. 612 – *A neural network architecture for data editing in the Bank of Italy's business surveys* by Claudia Biancotti, Leandro D'Aurizio and Raffaele Tartaglia Polcini (February 2007).

N. 613 – *Outward FDI and local employment growth in Italy*, by Stefano Federico and Gaetano Alfredo Minerva (February 2007).

N. 614 – *Testing for trend,* by Fabio Busetti and Andrew Harvey (February 2007).

N. 615 – *Macroeconomic uncertainty and banks' lending decisions: The case of Italy,* by Mario Quagliariello (February 2007).

N. 616 – *Entry barriers in italian retail trade,* by Fabiano Schivardi and Eliana Viviano (February 2007).

N. 617 – *A politicy-sensible core-inflation measure for the euro area,* by Stefano Siviero and Giovanni Veronese (February 2007).

N. 618 – *Le opinioni degli italiani sull'evasione fiscale,* by Luigi Cannari and Giovanni D'Alessio (February 2007).

"TEMI" LATER PUBLISHED ELSEWHERE

2000

P. ANGELINI, *Are banks risk-averse? Intraday timing of the operations in the interbank market*, Journal of Money, Credit and Banking, Vol. 32 (1), pp. 54-73, **TD No. 266 (April 1996).**

F. DRUDI and R. GIORDANO, *Default Risk and optimal debt management,* Journal of Banking and Finance, Vol. 24 (6), pp. 861-891, **TD No. 278 (September 1996)**.

F. DRUDI and R. GIORDANO, *Wage indexation, employment and inflation,* Scandinavian Journal of Economics, Vol. 102 (4), pp. 645-668, **TD No. 292 (December 1996)**.

F. DRUDI and A. PRATI, *Signaling fiscal regime sustainability,* European Economic Review, Vol. 44 (10), pp. 1897-1930, **TD No. 335 (September 1998)**.

F. FORNARI and R. VIOLI, *The probability density function of interest rates implied in the price of options,* in: R. Violi, (ed.) , Mercati dei derivati, controllo monetario e stabilità finanziaria, Il Mulino, Bologna, **TD No. 339 (October 1998)**.

D. J. MARCHETTI and G. PARIGI, *Energy consumption, survey data and the prediction of industrial production in Italy,* Journal of Forecasting, Vol. 19 (5), pp. 419-440, **TD No. 342 (December 1998)**.

A. BAFFIGI, M. PAGNINI and F. QUINTILIANI, *Localismo bancario e distretti industriali: assetto dei mercati del credito e finanziamento degli investimenti,* in: L.F. Signorini (ed.), Lo sviluppo locale: un'indagine della Banca d'Italia sui distretti industriali, pp. 237-256, Meridiana Libri, **TD No. 347 (March 1999)**.

F. LIPPI, *Median voter preferences, central bank independence and conservatism*, Public Choice, v. 105, 3-4, pp. 323-338 **TD No. 351 (April 1999)**.

A. SCALIA and V. VACCA, *Does market transparency matter? A case study*, in: Market Liquidity: Research Findings and Selected Policy Implications, Basel, Bank for International Settlements, **TD No. 359 (October 1999)**.

F. SCHIVARDI, *Rigidità nel mercato del lavoro, disoccupazione e crescita*, Giornale degli economisti e Annali di economia, Vol. 59 (1), pp. 115-141, **TD No. 364 (December 1999)**.

G. BODO, R. GOLINELLI and G. PARIGI, *Forecasting industrial production in the euro area,* Empirical Economics, Vol. 25 (4), pp. 541-561, **TD No. 370 (March 2000)**.

F. ALTISSIMO, D. J. MARCHETTI and G. P. ONETO, *The Italian business cycle: Coincident and leading indicators and some stylized facts,* Giornale degli economisti e Annali di economia, Vol. 60 (2), pp. 147-220, **TD No. 377 (October 2000)**.

C. MICHELACCI and P. ZAFFARONI, *(Fractional) Beta convergence*, Journal of Monetary Economics, Vol. 45 (1), pp. 129-153, **TD No. 383 (October 2000)**.

R. DE BONIS and A. FERRANDO, *The Italian banking structure in the nineties: Testing the multimarket contact hypothesis*, Economic Notes, Vol. 29 (2), pp. 215-241, **TD No. 387 (October 2000)**.

S. SIVIERO and D. TERLIZZESE, *La previsione macroeconomica: alcuni luoghi comuni da sfatare*, Rivista italiana degli economisti, v. 5, 2, pp. 291-322, **TD No. 395 (February 2001)**.

G. DE BLASIO and F. MINI, *Seasonality and capacity: An application to Italy*, IMF Working Paper, 80, **TD No. 403 (June 2001)**.

2001

M. CARUSO, *Stock prices and money velocity: A multi-country analysis,* Empirical Economics, Vol. 26 (4), pp. 651-672, **TD No. 264 (February 1996)**.

P. CIPOLLONE and D. J. MARCHETTI, *Bottlenecks and limits to growth: A multisectoral analysis of Italian industry*, Journal of Policy Modeling, Vol. 23 (6), pp. 601-620, **TD No. 314 (August 1997)**.

P. CASELLI, *Fiscal consolidations under fixed exchange rates,* European Economic Review, Vol. 45 (3), pp. 425-450, **TD No. 336 (October 1998)**.

F. ALTISSIMO and G. L. VIOLANTE, *The non-linear dynamics of output and unemployment in the US,* Journal of Applied Econometrics, Vol. 16 (4), pp. 461-486, **TD No. 338 (October 1998)**.

F. NUCCI and A. F. POZZOLO, *Investment and the exchange rate: An analysis with firm-level panel data*, European Economic Review, Vol. 45 (2), pp. 259-283, **TD No. 344 (December 1998)**.

A. ZAGHINI, *Fiscal adjustments and economic performing: A comparative study*, Applied Economics, Vol. 33 (5), pp. 613-624, **TD No. 355 (June 1999)**.

L. GAMBACORTA, *On the institutional design of the European monetary union: Conservatism, stability pact and economic shocks,* Economic Notes, Vol. 30 (1), pp. 109-143, **TD No. 356 (June 1999)**.

P. FINALDI RUSSO and P. ROSSI, *Credit costraints in italian industrial districts,* Applied Economics, Vol. 33 (11), pp. 1469-1477, **TD No. 360 (December 1999)**.

A. CUKIERMAN and F. LIPPI, *Labor markets and monetary union: A strategic analysis,* Economic Journal, Vol. 111 (473), pp. 541-565, **TD No. 365 (February 2000)**.

G. PARIGI and S. SIVIERO, *An investment-function-based measure of capacity utilisation, potential output and utilised capacity in the Bank of Italy's quarterly model*, Economic Modelling, Vol. 18 (4), pp. 525-550, **TD No. 367 (February 2000)**.

P. CASELLI, P. PAGANO and F. SCHIVARDI, *Investment and growth in Europe and in the United States in the nineties,* Rivista di politica economica, v. 91, 10, pp. 3-35, **TD No. 372 (March 2000)**.

F. BALASSONE and D. MONACELLI, *Emu fiscal rules: Is there a gap?,* in: M. Bordignon and D. Da Empoli (eds.), Politica fiscale, flessibilità dei mercati e crescita, Milano, Franco Angeli, **TD No. 375 (July 2000)**.

A. B. ATKINSON and A. BRANDOLINI, *Promise and pitfalls in the use of "secondary" data-sets: Income inequality in OECD countries as a case study*, Journal of Economic Literature, Vol. 39 (3), pp. 771-799, **TD No. 379 (October 2000)**.

D. FOCARELLI and A. F. POZZOLO, *The patterns of cross-border bank mergers and shareholdings in OECD countries*, Journal of Banking and Finance, Vol. 25 (12), pp. 2305-2337, **TD No. 381 (October 2000)**.

M. SBRACIA and A. ZAGHINI, *Expectations and information in second generation currency crises models*, Economic Modelling, Vol. 18 (2), pp. 203-222, **TD No. 391 (December 2000)**.

F. FORNARI and A. MELE, *Recovering the probability density function of asset prices using GARCH as diffusion approximations,* Journal of Empirical Finance, Vol. 8 (1), pp. 83-110**, TD No. 396 (February 2001)**.

P. CIPOLLONE, *La convergenza dei salari dell'industria manifatturiera in Europa,* Politica economica, Vol. 17 (1), pp. 97-125, **TD No. 398 (February 2001)**.

E. BONACCORSI DI PATTI and G. GOBBI, *The changing structure of local credit markets: Are small businesses special?*, Journal of Banking and Finance, Vol. 25 (12), pp. 2209-2237, **TD No. 404 (June 2001)**.

L. DEDOLA and S. LEDUC, *Why is the business-cycle behaviour of fundamentals alike across exchange-rate regimes?,* International Journal of Finance and Economics, v. 6, 4, pp. 401-419, **TD No. 411 (August 2001)**.

M. PAIELLA, *Limited Financial Market Participation: a Transaction Cost-Based Explanation,* IFS Working Paper, 01/06, **TD No. 415 (August 2001)**.

G. MESSINA, *Per un federalismo equo e solidale: obiettivi e vincoli per la perequazione regionale in Italia,,* Studi economici, Vol. 56 (73), pp. 131-148, **TD No. 416 (August 2001)**.

L GAMBACORTA *Bank-specific characteristics and monetary policy transmission: the case of Italy,* ECB Working Paper, 103, **TD No. 430 (December 2001)**.

F. ALTISSIMO, A. BASSANETTI, R. CRISTADORO, M. FORNI, M. LIPPI, L. REICHLIN and G. VERONESE *A real time coincident indicator of the euro area business cycle,* CEPR Discussion Paper, 3108, **TD No. 436 (December 2001)**.

A. GERALI and F. LIPPI, *On the "conquest" of inflation,* CEPR Discussion Paper, 3101, **TD No. 444 (July 2002)**.

L. GUISO and M. PAIELLA, *Risk aversion, wealth and background risk,* CEPR Discussion Paper, 2728, **TD No. 483 (September 2003)**.

2002

R. CESARI and F. PANETTA, *The performance of italian equity fund*, Journal of Banking and Finance, Vol. 26 (1), pp. 99-126, **TD No. 325 (January 1998)**.

F. ALTISSIMO, S. SIVIERO and D. TERLIZZESE, *How deep are the deep parameters?,* Annales d'Economie et de Statistique, (67/68), pp. 207-226, **TD No. 354 (June 1999)**.

F. FORNARI, C. MONTICELLI, M. PERICOLI and M. TIVEGNA, *The impact of news on the exchange rate of the lira and long-term interest rates,* Economic Modelling, Vol. 19 (4), pp. 611-639, **TD No. 358 (October 1999)**.

D. FOCARELLI, F. PANETTA and C. SALLEO, *Why do banks merge?,* Journal of Money, Credit and Banking, Vol. 34 (4), pp. 1047-1066, **TD No. 361 (December 1999)**.

D. J. MARCHETTI, *Markup and the business cycle: Evidence from Italian manufacturing branches,* Open Economies Review, Vol. 13 (1), pp. 87-103, **TD No. 362 (December 1999)**.

F. BUSETTI, *Testing for (common) stochastic trends in the presence of structural break,* Journal of Forecasting, Vol. 21 (2), pp. 81-105, **TD No. 385 (October 2000)**.

F. LIPPI, *Revisiting the Case for a Populist Central Banker,* European Economic Review, Vol. 46 (3), pp. 601-612, **TD No. 386 (October 2000)**.

F. PANETTA, *The stability of the relation between the stock market and macroeconomic forces,* Economic Notes, Vol. 31 (3), pp. 417-450, **TD No. 393 (February 2001)**.

G. GRANDE and L. VENTURA, *Labor income and risky assets under market incompleteness: Evidence from Italian data,* Journal of Banking and Finance, Vol. 26 (2-3), pp. 597-620, **TD No. 399 (March 2001)**.

A. BRANDOLINI, P. CIPOLLONE and P. SESTITO, *Earnings dispersion, low pay and household poverty in Italy, 1977-1998,* in D. Cohen, T. Piketty and G. Saint-Paul (eds.), The Economics of Rising Inequalities, Oxford, Oxford University Press, **TD No. 427 (November 2001)**.

E. GAIOTTI and A. GENERALE, *Does monetary policy have asymmetric effects? A look at the investment decisions of Italian firms,* Giornale degli economisti e annali di economia, v. 61, 1, pp. 29-60, **TD No. 429 (December 2001)**.

G. M. TOMAT, *Durable goods, price indexes and quality change: An application to automobile prices in Italy, 1988-1998,* ECB Working Paper, 118, **TD No. 439 (March 2002)**.

A. PRATI and M. SBRACIA, *Currency crises and uncertainty about fundamentals,* IMF Working Paper, 3, **TD No. 446 (July 2002)**.

L. CANNARI and G. D'ALESSIO, *La distribuzione del reddito e della ricchezza nelle regioni italiane,* Rivista Economica del Mezzogiorno, Vol. 16 (4), pp. 809-847, Il Mulino, **TD No. 482 (June 2003)**.

2003

L. GAMBACORTA, *Asymmetric bank lending channels and ECB monetary policy,* Economic Modelling, Vol. 20, 1, pp. 25-46, **TD No. 340 (October 1998)**.

F. SCHIVARDI, *Reallocation and learning over the business cycle,* European Economic Review, Vol. 47 (1), pp. 95-111, **TD No. 345 (December 1998)**.

P. CASELLI, P. PAGANO and F. SCHIVARDI, *Uncertainty and slowdown of capital accumulation in Europe,* Applied Economics, Vol. 35 (1), pp. 79-89, **TD No. 372 (March 2000).**

F. LIPPI, *Strategic monetary policy with non-atomistic wage setters,* Review of Economic Studies, v. 70, 4, pp. 909-919, **TD No. 374 (June 2000)**.

P. ANGELINI and N. CETORELLI, *The effect of regulatory reform on competition in the banking industry,* Journal of Money, Credit and Banking, Vol. 35, 5, pp. 663-684, **TD No. 380 (October 2000)**.

P. PAGANO and G. FERRAGUTO, Endogenous growth with intertemporally dependent preferences, Contribution to Macroeconomics, Vol. 3 (1), pp. 1-38, **TD No. 382 (October 2000).**

P. PAGANO and F. SCHIVARDI, *Firm size distribution and growth,* Scandinavian Journal of Economics, Vol. 105 (2), pp. 255-274, **TD No. 394 (February 2001)**.

M. PERICOLI and M. SBRACIA, *A Primer on Financial Contagion,* Journal of Economic Surveys, Vol. 17 (4), pp. 571-608, **TD No. 407 (June 2001)**.

M. SBRACIA and A. ZAGHINI, *The role of the banking system in the international transmission of shocks,* World Economy, Vol. 26 (5), pp. 727-754, **TD No. 409 (June 2001)**.

L. GAMBACORTA, *The Italian banking system and monetary policy transmission: evidence from bank level data,* in: I. Angeloni, A. Kashyap and B. Mojon (eds.), Monetary Policy Transmission in the Euro Area, Cambridge University Press, **TD No. 430 (December 2001).**

M. EHRMANN, L. GAMBACORTA, J. MARTÍNEZ PAGÉS, P. SEVESTRE and A. WORMS, *Financial systems and the role of banks in monetary policy transmission in the euro area,* in: I. Angeloni, A. Kashyap and

B. Mojon (eds.), Monetary Policy Transmission in the Euro Area, Cambridge, Cambridge University Press, **TD No. 432 (December 2001)**.

F. SPADAFORA, *Official bailouts, moral hazard and the "Specialtiy" of the international interbank market*, Emerging Markets Review, Vol. 4 (2), pp. 165-196, **TD No. 438 (March 2002)**.

D. FOCARELLI and F. PANETTA, *Are mergers beneficial to consumers? Evidence from the market for bank deposits*, American Economic Review, Vol. 93 (4), pp. 1152-1172, **TD No. 448 (July 2002)**.

E.VIVIANO, *Un'analisi critica delle definizioni di disoccupazione e partecipazione in Italia,* Politica Economica, Vol. 19 (1), pp. 161-190, **TD No. 450 (July 2002)**.

M. PAGNINI, *Misura e determinanti dell'agglomerazione spaziale nei comparti industriali in Italia*, Rivista di Politica Economica, Vol. 93 (3-4), pp. 149-196, **TD No. 452 (October 2002)**.

F. PANETTA, *Evoluzione del sistema bancario e finanziamento dell'economia nel Mezzogiorno,* Moneta e credito, v. 56, 222, pp. 127-160, **TD No. 467 (March 2003)**.

F. BUSETTI and A. M. ROBERT TAYLOR, *Testing against stochastic trend and seasonality in the presence of unattended breaks and unit roots*, Journal of Econometrics, Vol. 117 (1), pp. 21-53, **TD No. 470 (March 2003)**.

P. ZAFFARONI, *Testing against stochastic trend and seasonality in the presence of unattended breaks and unit roots,* Journal of Econometrics, v. 115, 2, pp. 199-258, **TD No. 472 (June 2003)**.

E. BONACCORSI DI PATTI, G. GOBBI and P. E. MISTRULLI, *Sportelli e reti telematiche nella distribuzione dei servizi bancari,* Banca impresa società, v. 2, 2, pp. 189-209, **TD No. 508 (July 2004)**.

2004

P. ANGELINI and N. CETORELLI, *Gli effetti delle modifiche normative sulla concorrenza nel mercato creditizio,* in F. Panetta (eds.), Il sistema bancario negli anni novanta: gli effetti di una trasformazione, Bologna, il Mulino, **TD No. 380 (October 2000)**.

P. CHIADES and L. GAMBACORTA, *The Bernanke and Blinder model in an open economy: The Italian case,* German Economic Review, Vol. 5 (1), pp. 1-34, **TD No. 388 (December 2000)**.

M. BUGAMELLI and P. PAGANO, *Barriers to Investment in ICT*, Applied Economics, Vol. 36 (20), pp. 2275-2286, **TD No. 420 (October 2001)**.

F. BUSETTI, *Preliminary data and econometric forecasting: An application with the Bank of Italy quarterly model*, CEPR Discussion Paper, 4382, **TD No. 437 (December 2001)**.

A. BAFFIGI, R. GOLINELLI and G. PARIGI, *Bridge models to forecast the euro area GDP*, International Journal of Forecasting, Vol. 20 (3), pp. 447-460,**TD No. 456 (December 2002)**.

D. AMEL, C. BARNES, F. PANETTA and C. SALLEO, *Consolidation and Efficiency in the Financial Sector: A Review of the International Evidence*, Journal of Banking and Finance, Vol. 28 (10), pp. 2493-2519, **TD No. 464 (December 2002).**

M. PAIELLA, *Heterogeneity in financial market participation: Appraising its implications for the C-CAPM*, Review of Finance, Vol. 8, 3, pp. 445-480, **TD No. 473 (June 2003)**.

F. CINGANO and F. SCHIVARDI, *Identifying the sources of local productivity growth,* Journal of the European Economic Association, Vol. 2 (4), pp. 720-742, **TD No. 474 (June 2003)**.

E. BARUCCI, C. IMPENNA and R. RENÒ, *Monetary integration, markets and regulation*, Research in Banking and Finance, (4), pp. 319-360, **TD No. 475 (June 2003)**.

G. ARDIZZI, *Cost efficiency in the retail payment networks: first evidence from the Italian credit card system*, Rivista di Politica Economica, Vol. 94, (3), pp. 51-82, **TD No. 480 (June 2003)**.

E. BONACCORSI DI PATTI and G. DELL'ARICCIA, *Bank competition and firm creation*, Journal of Money Credit and Banking, Vol. 36 (2), pp. 225-251, **TD No. 481 (June 2003)**.

R. GOLINELLI and G. PARIGI, *Consumer sentiment and economic activity: a cross country comparison*, Journal of Business Cycle Measurement and Analysis, Vol. 1 (2), pp. 147-170, **TD No. 484 (September 2003)**.

L. GAMBACORTA and P. E. MISTRULLI, *Does bank capital affect lending behavior?*, Journal of Financial Intermediation, Vol. 13 (4), pp. 436-457, **TD No. 486 (September 2003)**.

F. SPADAFORA, *Il pilastro privato del sistema previdenziale: il caso del Regno Unito,* Economia Pubblica, 34, (5), pp. 75-114, **TD No. 503 (June 2004)**.

C. BENTIVOGLI and F. QUINTILIANI, *Tecnologia e dinamica dei vantaggi comparati: un confronto fra quattro regioni italiane*, in C. Conigliani (eds.), *Tra sviluppo e stagnazione: l'economia dell'Emilia-Romagna*, Bologna, Il Mulino, **TD No. 522 (October 2004)**.

G. GOBBI and F. LOTTI, *Entry decisions and adverse selection: an empirical analysis of local credit markets,* Journal of Financial services Research, Vol. 26 (3), pp. 225-244, **TD No. 535 (December 2004)**.

E. GAIOTTI and F. LIPPI, *Pricing behavior and the introduction of the euro:evidence from a panel of restaurants*, Giornale degli Economisti e Annali di Economia, 2004, Vol. 63, (3/4), pp. 491-526, **TD No. 541 (February 2005)**.

2005

L. DEDOLA and F. LIPPI, *The monetary transmission mechanism: Evidence from the industries of 5 OECD countries,* European Economic Review, 2005, Vol. 49, (6), pp. 1543-1569, **TD No. 389 (December 2000)**.

D. J. MARCHETTI and F. NUCCI, *Price stickiness and the contractionary effects of technology shocks.* European Economic Review, v. 49, pp. 1137-1164, **TD No. 392 (February 2001)**.

G. CORSETTI, M. PERICOLI and M. SBRACIA, *Some contagion, some interdependence: More pitfalls in tests of financial contagion,* Journal of International Money and Finance, v. 24, 8, pp. 1177-1199, **TD No. 408 (June 2001)**.

GUISO L., L. PISTAFERRI and F. SCHIVARDI, *Insurance within the firm.* Journal of Political Economy, 113, pp. 1054-1087, **TD No. 414** (**August 2001**)

R. CRISTADORO, M. FORNI, L. REICHLIN and G. VERONESE, *A core inflation indicator for the euro area,* Journal of Money, Credit, and Banking, v. 37, 3, pp. 539-560, **TD No. 435 (December 2001)**.

F. ALTISSIMO, E. GAIOTTI and A. LOCARNO, *Is money informative? Evidence from a large model used for policy analysis,* Economic & Financial Modelling, v. 22, 2, pp. 285-304, **TD No. 445 (July 2002)**.

G. DE BLASIO and S. DI ADDARIO, *Do workers benefit from industrial agglomeration?* Journal of regional Science, Vol. 45, (4), pp. 797-827, **TD No. 453 (October 2002).**

R. TORRINI, *Cross-country differences in self-employment rates: The role of institutions*, Labour Economics, V. 12, 5, pp. 661-683, **TD No. 459 (December 2002)**.

A. CUKIERMAN and F. LIPPI, *Endogenous monetary policy with unobserved potential output,* Journal of Economic Dynamics and Control, v. 29, 11, pp. 1951-1983, **TD No. 493 (June 2004)**.

M. OMICCIOLI, *Il credito commerciale: problemi e teorie,* in L. Cannari, S. Chiri e M. Omiccioli (eds.), *Imprese o intermediari? Aspetti finanziari e commerciali del credito tra imprese in Italia*, Bologna, Il Mulino, **TD No. 494 (June 2004)**.

L. CANNARI, S. CHIRI and M. OMICCIOLI, *Condizioni di pagamento e differenziazione della clientela,* in L. Cannari, S. Chiri e M. Omiccioli (eds.), *Imprese o intermediari? Aspetti finanziari e commerciali del credito tra imprese in Italia*, Bologna, Il Mulino, **TD No. 495 (June 2004)**.

P. FINALDI RUSSO and L. LEVA, *Il debito commerciale in Italia: quanto contano le motivazioni finanziarie?,* in L. Cannari, S. Chiri e M. Omiccioli (eds.), *Imprese o intermediari? Aspetti finanziari e commerciali del credito tra imprese in Italia*, Bologna, Il Mulino, **TD No. 496 (June 2004)**.

A. CARMIGNANI, *Funzionamento della giustizia civile e struttura finanziaria delle imprese: il ruolo del credito commerciale,* in L. Cannari, S. Chiri e M. Omiccioli (eds.), *Imprese o intermediari? Aspetti finanziari e commerciali del credito tra imprese in Italia*, Bologna, Il Mulino, **TD No. 497 (June 2004)**.

G. DE BLASIO, *Credito commerciale e politica monetaria: una verifica basata sull'investimento in scorte,* in L. Cannari, S. Chiri e M. Omiccioli (eds.), *Imprese o intermediari? Aspetti finanziari e commerciali del credito tra imprese in Italia*, Bologna, Il Mulino, **TD No. 498 (June 2004)**.

G. DE BLASIO, *Does trade credit substitute bank credit? Evidence from firm-level data.* Economic notes, Vol. 34 (1), pp. 85-112, **TD No. 498 (June 2004).**

A. DI CESARE, *Estimating Expectations of Shocks Using Option Prices,* The ICFAI Journal of Derivatives Markets, Vol. 2, (1), pp. 42-53, **TD No. 506 (July 2004).**

M. BENVENUTI and M. GALLO, *Il ricorso al "factoring" da parte delle imprese italiane,* in L. Cannari, S. Chiri e M. Omiccioli (eds.), *Imprese o intermediari? Aspetti finanziari e commerciali del credito tra imprese in Italia*, Bologna, Il Mulino, **TD No. 518 (October 2004)**.

L. CASOLARO and L. GAMBACORTA, *Redditività bancaria e ciclo economico,* Bancaria, v. 61, 3, pp. 19-27, **TD No. 519 (October 2004)**.

F. PANETTA, F. SCHIVARDI and M. SHUM, *Do mergers improve information? Evidence from the loan market,* CEPR Discussion Paper, 4961, **TD No. 521 (October 2004)**.

P. Del Giovane and R. Sabbatini, *La divergenza tra inflazione rilevata e percepita in Italia,* Bologna, Il Mulino, **TD No. 532 (December 2004).**

R. Torrini, *Quota dei profitti e redditività del capitale in Italia: un tentativo di interpretazione*, Politica economica, v. 21, pp. 7-42, **TD No. 551 (June 2005)**.

M. Omiccioli, *Il credito commerciale come "collateral"*, in L. Cannari, S. Chiri, M. Omiccioli (eds.), Imprese o intermediari? Aspetti finanziari e commerciali del credito tra imprese in Italia, Bologna, il Mulino, **TD No. 553 (June 2005)**.

L. Casolaro, L. Gambacorta and L. Guiso, *Regulation, formal and informal enforcement and the development of the household loan market. Lessons from Italy,* in Bertola G., Grant C. and Disney R. (eds.) The Economics of Consumer Credit: European Experience and Lessons from the US, Boston, MIT Press, **TD No. 560 (September 2005)**.

S. Di Addario and E. Patacchini, *Wages and the city: The italian case,* University of Oxford, Department of Economics. Discussion Paper, 243, **TD No. 570 (January 2006)**.

P. Angelini and F. Lippi, *Did inflation really soar after the euro changeover? Indirect evidence from ATM withdrawals,* CEPR Discussion Paper, 4950, **TD No. 581 (March 2006)**.

2006

C. Biancotti, *A polarization of inequality? The distribution of national Gini coefficients 1970-1996*, Journal of Economic Inequality, v. 4, 1, pp. 1-32, **TD No. 487 (March 2004)**.

M. Bofondi and G. Gobbi, *Information barriers to entry into credit markets,* Review of Finance, Vol. 10 (1), pp. 39-67, **TD No. 509 (July 2004).**

Lippi F. and W. Fuchs, *Monetary union with voluntary participation,* Review of Economic Studies, 73, pp. 437-457 **TD No. 512 (July 2004).**

Gaiotti E. and A. Secchi, *Is there a cost channel of monetary transmission? An investigation into the pricing behaviour of 2000 firms*, Journal of Money, Credit, and Banking, v. 38, 8, pp. 2013-2038 **TD No. 525 (December 2004)**.

A. Brandolini, P. Cipollone and E. Viviano, *Does the ILO definition capture all unemployment?,* Journal of the European Economic Association, v. 4, 1, pp. 153-179, **TD No. 529 (December 2004)**.

A. Brandolini, L. Cannari, G. D'Alessio and I. Faiella, *Household Wealth Distribution in Italy in the 1990s,* In E. N. Wolff (ed.) International Perspectives on Household Wealth, Cheltenham, Edward Elgar, **TD No. 530 (December 2004)**.

A. Nobili, *Assessing the predictive power of financial spreads in the euro area: does parameters instability matter?,* Empirical Economics, v. 31, 4, pp. , **TD No. 544 (February 2005)**.

L. Guiso and M. Paiella, *The Role of Risk Aversion in Predicting Individual Behavior, In P. A. Chiappori e C. Gollier (eds.) Competitive Failures in Insurance Markets: Theory and Policy Implications, Monaco, CESifo*, **TD No. 546 (February 2005).**

G. M. Tomat, *Prices product differentiation and quality measurement: A comparison between hedonic and matched model methods*, Research in Economics, No. 60, pp. 54-68, **TD No. 547 (February 2005)**.

M. Caruso, *Stock market fluctuations and money demand in Italy, 1913 - 2003*, Economic Notes, v. 35, 1, pp. 1-47, **TD No. 576 (February 2006)**.

R. Bronzini and G. de Blasio, *Evaluating the impact of investment incentives: The case of Italy's Law 488/92.* Journal of Urban Economics, vol. 60, n. 2, pag. 327-349, **TD No. 582 (March 2006).**

A. Di Cesare, *Do market-based indicators anticipate rating agencies? Evidence for international banks*, Economic Notes, v. 35, pp. 121-150, **TD No. 593 (May 2006).**

FORTHCOMING

S. Magri, *Italian Households' Debt: The Participation to the Debt market and the Size of the Loan*, Empirical Economics, **TD No. 454 (October 2002)**.

Lippi F. and S. Neri, *Information variables for monetary policy in a small structural model of the euro area*, Journal of Monetary Economics **TD No. 511 (July 2004)**.

Dedola L. and S. Neri, *What does a technology shock do? A VAR analysis with model-based sign restrictions*, Journal of Monetary Economics **TD No. 607 (December 2006)**.