Economic versus Psychological Forecasting.
Evidence from Consumer Confidence Surveys

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"There are two kinds of forecasters:
those who don't know, and those who don't know they don't know."
John Kenneth Galbraith (*Wall Street Journal*, Jan 22, 1993)

Abstract

Permanent and widespread psychological biases affect both the subjective probability of future economic events and their retrospective interpretation. They may give rise to a systematic gap between (over-critical) judgments and (over-optimistic) expectations - the "forecast" error. When things go bad, then, psychology suggests that people tend to become particularly bullish, amplifying the forecast error. Also, psychology argues that personal/future conditions are systematically perceived to be better than the aggregate/past ones. All this sharply contrasts with standard economic assumptions. Evidence from a unique dataset covering ten European countries over twenty-two years confirms the presence of structural psychologically driven distortions in people's judgments and expectations formation.

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1. Introduction

By tradition and necessity, economics is a behavioral science and people's expectations play a pivotal role in it. Nevertheless, by recent tradition and analytical necessity, economists tend to approach expectations in a rather axiomatic way. The standard economic literature merely assumes that the representative agent is an unemotional computer which, in the long run, cannot repeat the same mistake. Given a long enough time span and conditional on an information set, objective (i.e. in some sense statistically optimal) and subjective expectations must, on average, coincide. The logic behind is twofold – i) erring is costly; ii) people learn by doing. Although the way in which agents form expectations is not addressed by standard economics homo economicus has, thus, both the motivation and the occasion for operating rationally[1].

Arguably because of its less axiomatic and more descriptive approach, cognitive psychology tells a different story: biases are likely to be the rule, not the exception (Kahneman & Tversky, 1973, 1974, 1982). Kahneman and Tversky (1974) argued that heuristic short-cuts create probability judgments which deviate from statistical principles. Intuitive strategies and simple heuristics are reasonably effective some of the time, but they also produce biases and give rise to systematic incongruities when assessing economic conditions/evolutions. Two things are worth emphasizing here. First, individuals may persist with biased beliefs because they are unaware of being self-incoherent or because they convince themselves that they are right. Whatever the case may be, considering the presence of costs due to errors or waiting for people to change their mind may be misleading. More in general, despite market forces (competition and arbitrage) and learning by doing, psychologists suggest that irrational behavior is not contingent (Mullainathan & Thaler, 2000). Second, psycho-biases affect a significant share of the population: that is, they are not isolated quirks, but deep-seated and systematic behavioral patterns which impinge on people's judgments/expectations formation.

Consumer confidence surveys (CCS) are useful and in fact widely accepted devices with which to gather information about common people's expectations over time (Ludvigson, 2004). A number of recent papers have studied micro data from CCS in an

[1] The rational expectation hypothesis implies more than unbiasedness (Pesaran and Weale, 2006), but here we are only interested in biases.

attempt to identify individual-level forecast errors from consecutive or matched surveys (Brown & Taylor, 2006; Das & van Soest, 1997; Das, Dominitz & van Soest, 1999; Mitchell & Weale, 2007; Souleles, 2004). On studying the difference between ex ante expectations and subsequent realizations, i.e. the "survey" forecast error (SFE), these works usually find a non-zero SFE and they reject the rational expectations hypothesis (REH). Notwithstanding the pivotal role of REH in mainstream economic models, it is hard to understand why so few authors seek to explain the enduring presence of non standard behaviors. Within the economic tradition, Carroll (2003) and Branch (2004) suggest that the REH is rejected because the costs of forming rational expectations exceeding the benefits. Another strand of research, which roughly and somewhat timidly draws on psychology, i) points to belief distortions that may increase the well-being (Brunnermeier & Parker, 2005; Caplin & Leahy, 2001; Yariv, 2001), or it assumes that agents, although rational, ii) have limited information processing capacity (Sims, 2003), or iii) update information infrequently (Reis, 2006).

Against this background the novelty, and the aim, of this study is twofold. First, we propose an unusual psychological interpretation of the SFE and of other similar ex ante/post incongruities in people's judgments/expectations as collected by CCS (Section 2). There are several reasons for addressing CCS data in the light of cognitive psychology. First, as argued by Katona (1958), CCS should/could collect information on sentiments. To the extent that replies reflect moods, they are not statistically-based forecasts and the gaps between judgments and expectations can be well interpreted by means of psychological arguments.[2] Moreover, cognitive psychology allows consideration even of problems linked to retrospective questions. Indeed, by definition, incoherent views may stem from both overly pessimistic judgments and overly optimistic expectations. Instead, however, ex post realizations are often conceived as the "objective (unbiased) benchmark" against which ex ante subjective expectations must be compared. Thus, the psychological approach makes one wonder whether people suffer from biases in both backward- and forward-looking exercises. When ordinary persons are surveyed, moreover, some questions can be considered

[2] Typically, in fact, the economic literature examines whether CCS data add independent (i.e. beyond economic data/models) information about the economy (for a recent survey, see Ludvigson, 2004).

vague and/or hard-to-assess by the respondent (e.g., "How do you expect the general economic situation in the country to develop over the next 12 months?"). These may trigger heuristic, and hence biased, answers (Kahneman & Tversky 1973, 1974, 1982). As regards the SFE, psychology suggests that it may be significantly different from zero considering both many individuals and long periods of time, and that amid real or psychological economic hardships the SFE may be even larger. Other gaps suggested by the psychological analysis of people's replies refer to personal/future conditions, which may be systematically perceived as more bullish than the aggregate/past ones.

The paper's second contribution is that it offers evidence on these psychological biases by taking advantage of a unique dataset covering more than twenty years and ten European countries (Section 3). To our knowledge, then, this paper is the first attempt to conduct empirical analyses of the differences between ex ante expectations and ex post perceptions about "general economic conditions". Apart from being informative about judgments/expectations formation on key macroeconomic situations, the relative categorical answers are not affected by the so-called "Manski critique" (Manski, 1990; Subsection 5.1). On the negative side, respondents are randomly selected so that there are no genuine re-interviews.[3] Also, our basic data are the percentages of respondents who have chosen a particular option (a lot better, better, etc.). Thus, we have no individual-level data even within the same wave. In the present setting, however, these issues do not hamper useful econometric analyses. The study's main empirical goal, in fact, is to test whether judgments and expectations formation is structurally consistent with the innate biases uncovered by psychologists. To this end we regress survey data only on a constant, basing our identification strategy on the logic that the only (main) factors captured by the intercept are psychological biases. That this can be done is because of our unique dataset, dissolving the effects of temporary/localized/disparate elements (mismeasurements, economic shocks, etc.) and, above all, because of the rich set of testable a priori stemming from the analysis of CCS via cognitive psychology. We also control for heteroskedasticity and autocorrelation by computing Newey-West robust standard errors (Newey & West, 1987).

[3] Van Oest and Franses (2008) analyze consumer confidence indicators based on non genuine panels. They fairly argue that this complicates a straightforward interpretation of shifts in confidence and propose a methodology to address the related issues. It should be made clear, instead, that our empirical aim here is to find evidence on innate psycho-phenomena rather than on shifts in confidence.

Confirming previous results based on genuine (but short and single nationwide) panels, the data show that a perennial non-zero survey forecast error pervades Europe. This outcome is consistent with both the recent economic literature and psychology. But we furnish still more findings and interpretations of people's replies. As the interplay between prospect theory and illusion of control leads one to expect, e.g., conditional on having reported an unpleasant situation respondents tend to become particularly optimistic and, consequently, to over-err. More in general, and this is our main point, only psychological suggestions seem to offer a fully comprehensive explanation of the detected structural distortions affecting the formation of Europeans' judgments/expectations as they emerge from CCS data.

2. Psychological biases in judgments and expectations.

2.1. Overview

Humans receive and must arrange massive amount of data. Most of the latter are immediately ignored, discarded or abstracted away by neurological machinery. When new information is "zipped", converted into symbolic format and memorized, it is subject to certain biasing effects. The main problem is not the cost/amount/availability of information, but its handiness. As Simon (1971, p. 40) put it, "(…) a wealth of information creates a poverty of attention". As mentioned, some recent economic study has rediscovered Simon's hints (Reis, 2006; Sims, 2003). However, Kahneman and Tversky (1973, 1974, 1982) have suggested that the processes of intuitive judgment are not merely simpler than rational models demand, but are categorically different in kind. Their theory of heuristics and biases points out that because of the ways in which people process information, having accurate information does not necessarily improve decision-making, and sometimes may detract from it. Rather than accumulate the optimal amount of information, individuals often uncritically accept information that confirms their beliefs while they over-critically reject disconfirming data. They are overconfident in their judgments and are prone to base judgments on information that is vivid and available to memory rather than on information that is more accurate but dull and unmemorable. It is worth noting that these heuristic processes are not exceptional

responses to problems of excessive complexity or to an overload of information; rather, they are normal intuitive responses to even the simplest questions about likelihood, frequency, and prediction. Following the seminal studies of Kahneman and Tversky, many authors have documented numerous ways in which prospective and retrospective views do not cohere, do not follow basic principles of logic and probability, and depend systematically on irrelevant factors such as mood, context, or mode of presentation. Intuitive strategies and simple heuristics are reasonably effective some of the time, but they also produce biases and give rise to systematic incongruities. Therefore, although psychology has not (and may never) develop a unified theory that explains or predicts the full range of human behavior (Kopcke et al., 2004), it nonetheless offers a pragmatic collection of situation-specific mini-theories usefully exploitable in connection with CCS data. Some of the lessons from psychology can be recalled in the present context, and it is important to observe since now that all of them coherently point to the persistence of structural discrepancies in lay people's views on economic developments.

2.2. Why may lay people be prospectively over-optimistic about (especially personal) economic changes?

Representativeness is a heuristic for making probability judgments. A byproduct of representativeness is the law of small numbers. According to this law, people believe that the mean value from a small sample also has a distribution concentrated at the expected value of the random variable. This gives rise to a bias due to "overinference" from (too) short sequences of observations. In an overview of behavioral finance, Shleifer (2000) argues that the law of small numbers may explain the excess sensitivity of stock prices as a result of investors' overreacting to short strings of good news. A related aspect of this law is overconfidence. People tend to make forecasts in uncertain situations by looking for familiar patterns and assuming that future favorable patterns will resemble past ones, often without taking sufficient consideration of the reasons for the pattern or the probability of the pattern repeating itself (Shiller, 2000). Illusion of control (DeBondt & Thaler, 1995) may then explain why people believe that their own future situation will get better "against all odds". Its definition is highlighting: "an expectancy of a personal success probability inappropriately higher than the objective

probability would warrant" (Langer 1975, p. 313). Irrational exuberance, in Mr. Greenspan's famous 1996 speech, may thus be interpreted in the present context as the interplay between overconfidence and illusion of control: the former induces people to overestimate the precision of the signals that they receive; the latter induces individuals to overweight positive signals and to be over-optimistic. Closely related to the illusion of control is the theory of depressive realism. In a seminal paper, Alloy and Abramson (1979) found that non-depressed people are more likely than depressed people to think that outcomes are contingent on their actions when they are not. They concluded that as opposed to depressed persons, whose perceptions are apparently accurate, normal people distort reality in an optimistic fashion.[4]

2.3. Why could lay people be retrospectively over-critical of (especially macro) economic changes?

People suffer from the availability heuristic and unduly emphasize recent events: an economic shock may have psychological effects. These latter, in turn, affect the correct reading of past economic events. According to the so-called availability bias, individuals base their prediction of the frequency of an event on how easily an example can be brought to mind. Because an example is easily brought to mind or mentally "available", the single example is considered to be representative of the whole rather than just a single example in a range of data. This bias may help to explain why, as recently found (Brachinger, 2008), people can overweight the overall inflation rate when price changes hit especially frequently bought goods with small expenditure weight. That said it can also be added that, compared to unfamiliar information, familiar information is more easily accessible from memory, and it is therefore believed to be more real or relevant. It turns out that the mere repetition of certain information in the media, regardless of its accuracy, makes it more easily available and therefore falsely perceived as more accurate. The explanation is completed by observing that, as emphasized by Doms and Morin (2004), the media tend to overweight bad economic

[4] We may also speculate that non-depressed individuals distort reality in an optimistic fashion because being overconfident is an optimal choice. In other words, while psychology is silent on the causality issue, *i.e.* realism may induce depression, there is a body of economic literature which maintains that overconfidence may increase well-being (see Introduction).

news. Whilst this pertains to the nature itself of the news media, Blendon et al. (1997) have pointed out that the public's biases can be attributed to the media's focus on bad news. It has been argued that the over-critical information flow may also run from people to media (Curtin, 2003), although Blood and Phillips (1994) found a reverse causality. When individuals judge past economic conditions, a perverse spiral may in any case lock them into "backward-looking" pessimism. As over critical judgments are magnified in bad times (due to the media coverage) and expectations are "sticky" due to the illusion of control, economic hardships might enlarge the forecast error. It is also important to note that, ex post, economy-wide actual conditions are objectively equal for everyone. Only exploiting psychological considerations one may wonder whether people have a distorted reading of past situations even in the long run.

2.4. Why may lay people be both over-critical ex post and over-optimistic ex ante when asked about economic changes?

Both prospective and retrospective biases are congruent with mental accounting (Thaler, 1999), which posits that people mentally frame assets as belonging to either current or future income. From the individual's standpoint, therefore, judging and forecasting are "time separable" exercises that need not be self-consistent. When inserted in the present setting, then, the prospect theory (Kahneman & Tversky, 1979) suggests another reason why the survey forecast error may not be a zero-mean reverting process due to both ex ante and ex post arguments. Basically, the theory argues that people's attitude toward risk is conditional on some neutral or status quo point, which may vary from situation to situation. If the reference point is defined so that an outcome is viewed as a "gain", then the individual will tend to be risk averse. On the other hand, if the reference point is defined so that an outcome is viewed as a "loss", then the individual will be risk seeking. It turns out that individuals suffering from a reduction in their income tend to become risk lovers. In this event**,** which may be induced/magnified by retrospective pessimism, illusion of control may interact with prospect theory and over-optimistic expectations may be associated with over-critical judgments – economic hardships enlarge the SFE referring to personal situations.

2.5. Testable implications.

Psychology is silent on the magnitude of the biases and on whether the effects of the biases are constant over time and/or homogeneous across individuals. Nevertheless, all the distortions mentioned are innate and therefore so enduring and diffuse that they affect, at least in the long run, the representative individual. In addition, psychology indicates several factors that prevent people from adequately learning from the past and from being aware of their forecast errors. For example, experiments performed by Wason (1969) regarding the difficulty of people in making use of disconfirming information indicate that the inability to learn stems from the unwillingness to examine information that would disprove the position held. Staw and Ross (1989) discuss escalation, a situation in which a course of action has resulted in initial losses, but where action can be taken to modify and possibly reverse the original outcome. They observe that individuals can become locked into the existing course of action, "throwing good money or effort after bad" (page 216). A similar bias stems from conservatism, which is the tendency to change previous probability estimates more slowly than warranted by new data. Usually, slowness is defined relative to the amount of change prescribed by normative rules such as Bayes' theorem. Conservatism is the result of a combination of overconfidence with anchoring-and-adjustment. Consider, finally, the "hindsight/confirmation bias" (Bernstein, 1994). Suppose there is an unexpected event. People tend naturally to concoct explanations for it after the fact, which makes the event more predictable, and less random, than it is. More in general, as argued by Camerer (Kopcke et al., 2004), self-awareness is surprisingly limited.

To summarize, there are well-known psychological departures from statistical/rational expectations which may help understanding of widespread and ineradicable discrepancies between people's judgments and expectations. Whether or not these biases are conscious the point remains: psychological considerations univocally underline the enduring presence of a nonrandom mental "environment" potentially triggering inconsistent views on economic matters. Hence, by exploiting CCS data (Section 3), we may fruitfully test whether:

1. judgments and expectations on the economic situation consistently differ;

2. survey forecast errors are consistently greater in bad than in good times;

3. the personal economic situation is perceived to be structurally brighter (or less dark) than the economy-wide one;

4. the Future is perceived to be systematically brighter (or less dark) than the Past.

3. Data

For the purpose of examining the foregoing psychological implications empirically, a unique dataset can be obtained from the Business Surveys Unit of the European Commission. The dataset is based on monthly surveys carried out at a national level by public and private institutes in the framework of the Joint Harmonised European Union Programme of Business and Consumer Surveys.[5] The surveys are designed to capture the representative European consumer across twenty-seven countries. Almost 40,000 persons are usually selected by a random stratified sampling procedure or by simple random sampling.

Here we focus on four questions concerning general and personal financial situations/evolutions referring to the same past/next year (Appendix A). Respondents may choose among six qualitative reply options (a lot better, better, a lot better, better, the same, worse, a lot worse, don't know) and the individual-level answers are then used to compute the percentages of respondents having chosen a particular option. Only these six aggregate shares are available, and only four of them form the basis of this study. The exceptions are the proportions relative to the options "don't know" and "the same", which are set aside because results based on them are hard-to-interpret. We exclude the former because it is a "non response", i.e. it is not the outcome of an explicit elaboration but, rather, a declaration of no information[6]. In this regard, the European Commission Users' Manual (1997, p. 18) states that: "(…) there are six reply options: five "real" ones and a "do not know" option". Hence, for example, it is not easy to

[5] Detailed information on the Joint Harmonised EU Programme of Business and Consumer Surveys can be found in European Commission (1997, 2007).

[6] However, the data show a reliable distribution: on average, as expected, the greatest number of "do not knows" refer to future macroeconomic changes, the lowest to past personal stances (see Graph. 1, Appendix A).

decipher a survey forecast error computed by comparing prospective and retrospective "don't know". As for the other exclusion, it is important to note that the questions are about "developments/changes" (Appendix A). Thus, one might suspect a priori (Theil, 1961) that individuals respond "the same" on most occasions because it is hard to think of constantly improving/worsening economic conditions (whatever that means for lay people[7]) over many years. Psychology suggests that an over-preference for this neutral choice may be induced by the presence of uninformed and/or uninterested respondents. Part of the problem derives from the respondents' reluctance to admit to a lack of an attitude. Simply because the surveyor is asking the question, respondents believe that they should have an opinion about it. Since unbiased answers may be due to both psychological neutrality and analytical rationality,[8] we prefer to focus on replies in which psychological distortions may play a dominant role. We have rescaled the percentages accordingly[9] - rescaled Z=100*Z/(100-E-N), where Z=LB, B, W, LW.

Despite the fact that only dealt with are questions about general and personal economic conditions, national surveys contain other questions about the labor market, spending intentions on major purchases (furniture, electrical/electronic devices, etc.), savings, etc. Needless to say, each question has potential information content but the questions selected seem particularly suited to the empirical side of this study. When asked about "financial conditions/evolutions", indeed, ordinary people may use heuristic shortcuts to manage large quantities of information that may lead them astray. This is exactly what we want to study: do lay people answer according to a specific underlying framework? Is this latter congruent with the psychological indications of Section 2? Moreover, these data make it possible to match, repeatedly over almost three hundred months and across several European countries, expectations and judgments referring to the same time span (one year). Lastly, there is no need for respondents to address and quantify general economic[10] situations/evolutions exactly: only compared

[7] To the extent that i) GDP growth coincides with people's view of "development in economic condition", and ii) GDP growth follows a stationary process agents should, on average, accumulate towards the "stationary" item of the questionnaire.

[8] Interestingly, the data show that this is in fact the most frequently preferred reply option (see Graph. 1, Appendix A). Similar outcomes, based on genuine panel data, have been found for the UK (Mitchell & Weale, 2007).

[9] LB=a lot better; B=a little better; W=a little worse; LW=a lot worse (Appendix A). If not otherwise stated we henceforth refer to rescaled values. The overall picture is not affected when using non-rescaled percentages (results available upon request).

[10] Although the average value of variables such as GDP, Consumption, Wealth, etc., has been growing

are qualitative answers to the same question (see Sections 4 and Appendix A).

The data suffer from some change throughout the sample. Since 1995, for instance, Italy has replaced on-the-spot interviews with the telephone method. In Germany, apart from the issues arising from the re-unification of 1991, some modifications have been made to both the order and the wording of some questions. Consequently, there are some problems[11] in the time series comparability of the data. In an attempt to reduce temporary data issues and to increase the reliability of the econometric tools employed (see Section 4), we focus on the countries with the longest and most time-comparable datasets. Moreover, a long-lasting dataset reduces the time inconsistencies due to shocks hitting consumers after they have made the forecast and before they make the retrospective judgment - even more so considering that we examine full sample average values, and that we do so for several countries. We end up with ten countries[12] (Belgium, Germany, Ireland, Greece, France, Italy, Finland, Spain, Netherlands, UK) and 268 monthly interviews[13] (from January 1985 to April 2007).

4. Econometric methodology

To examine formally the first psychological suggestion of Subsection 2.5, we test the hypothesis $\beta_{Z\_Gen} \neq 0$ in the following regression

$$SFE\_Z_t\_Gen \equiv Q3\_Z_t - Q4\_Z_{t-12} = \beta_{Z\_Gen} + u_t \qquad (1)$$

where

$Q3\_Z_t$ = % of respondents to the question Q3 having chosen the Z reply option in the survey carried out in month t

$Q4\_Z_{t-12}$ = % of respondents to the question Q4 having chosen the Z reply option in the survey carried out in month t-12

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during the period across the countries under analysis, Europeans have been, on average, more pessimistic than optimistic. On summing over time and across Europe all the proportions relative to the eight pessimistic answers (four queries, two pessimistic reply options, see Appendix A), one obtains a number more than double that emerging from the sum of all the eight optimistic answers.

[11] Other problems affecting the data are more general; e.g., it is easily understood that there are no incentives/disincentives related to a particular answer. The fact that CCS are increasingly widely performed, commented upon and studied indirectly corroborates their reliability (see also Appendix A).

[12] About 20,000 consumers are surveyed each month across the ten European countries examined.

[13] Data for Spain start in June 1986, for Finland in November 1987.

Q3 = How do you think the general economic situation in the country has changed over the past 12 months? It has…

Q4 = How do you expect the general economic situation in the country to develop over the next 12 months? It will…

Z = LB, B, W, LW

LB = get/got a lot better

B = get/got a little better

W = get/got a little worse

LW = get/got a lot worse

β_{Z_Gen} = coefficient

u_t = random disturbance.

Similarly, mutatis mutandis,[14] for the survey forecast error referring to the personal questions: SFE_ Z_t _Per ≡ Q1_Z_t - Q2_Z_{t-12} = β_{Z_Per} + u_t. An example may help clarify the matter. Let the share of individuals forecasting that the system-wide economic situation will be "a little worse" in the next year be, according to the survey performed in January 2000, 35%. After a year, inter alia, interviewees are asked to answer question Q3. If people's forecasts were not affected by psychological distortions and if no shock hits consumers before they respond to Q3, then the share of citizens judging that the economic situation has got "a little worse" should be 35%. Needless to say, people may sometimes err even if they are Muth-rational – according to standard economics the SFEs must cancel out over time, that is to say, β_{Z_Gen}=0 (and β_{Z_Per}=0) whatever Z. According to psychology, instead, β_{Z_Gen} (and β_{Z_Per}) should be both significantly positive for Z=LW, W and significantly negative for Z=LB, B. For instance, if Q3_LW_t is significantly greater than Q4_LW_{t-12}, i.e. if β_{LW_Gen}>0, then judgments prove to be consistently darker than expectations. Likewise, if β_{LB_Gen}, β_{B_Gen}<0, then judgments are structurally less bright than expectations. Hence, psychology gives rise to a rich set of testable indications about the SFE (and not only).

Equation 1) has several good features in the present context. First, measurement errors that influence in the same way the two different waves of surveys used to

[14] Q1=How has the financial situation of your household changed over the last 12 months?
Q2=How do you expect the financial position of your household to change over the next 12 months?

compute the SFE (i.e., those carried out in period t and t_{-12} for t=1,…,n) disappear when differencing. This may happen with respect to sampling errors, which are likely to be a common factor influencing relatively consecutive surveys. Then mismeasurements do not affect the OLS estimate of the constant term (Greene, 2002). It should also be noted that examining the intercept is a necessary and sufficient condition (Boero et al., 2008) for testing immanent psychological implications. In general, our identification strategy relies on the fact that psycho-biases are the only (or, at least, the most important) structural factor captured by the constant. The underlying logic is that psychological biases are natural traits, and it is likely that they emerge when mean values referring to hundreds of observations are examined – all the more so when tests are replicated for ten countries. By the same token, measurement errors and time inconsistencies due to shocks hitting consumers after they have made the forecast and before they make the retrospective judgment do not matter: it is likely that both of them cancel out in the sample. Finally, the logic behind equation 1) can be straightforwardly used to assess the other testable psychological indications pointed out in Subsection 2.5. In fact, all the tests proposed basically amount to compute the average of the dependent variable. Therefore, to verify whether the mean value of the SFE is larger during times of economic hardships (i.e. when individuals respond LW or W) than in good times, we may test $\beta_{Gen}>0$ in the following[15] (suppressing the error term, see also equation 1):

$$(SFE\_LW_t\_Gen + SFE\_W_t\_Gen) - (SFE\_LB_t\_Gen + SFE\_B_t\_Gen) =$$
$$(\beta_{LW\_Gen} + \beta_{W\_Gen}) - (\beta_{LB\_Gen} + \beta_{B\_Gen}) = \beta_{Gen} \quad (2)$$

where Gen=(Q3, Q4)=General questions; and likewise, mutatis mutandis, for the Personal questions (Q1, Q2).

So far, we have contrasted the ex ante/post views of different representative consumers about the same year. In order to verify the last two psychological implications and to offer some robustness checks, we also examine judgments and expectations collected in the same survey. As compared to the previous regressions, the gain is that we study the replies given by the same statistical respondent. Clearly,

[15] We do not report all the four possible combinations (β_{LW} v β_{LB}, β_{LW} v β_{B}, etc.,) in order to save space and, above all, to address the drawbacks discussed in Section 5.

because beliefs refer to different years, the difference is not exactly[16] a SFE. The motivation is that our main empirical aim is to find evidence on psycho-biases and the SFE is just one of them. The logic is that over-critical judgments and over-optimistic expectations do not depend on the time period to which they refer: the tendency of past/general situations to be felt darker than future/personal ones should emerge even in tests examining different years. Basically, we perform regressions similar to equation 1) with two main differences. First, as said, we use contemporaneous proportions; second, we use balances. These latter are computed[17] as follows: $Qib_t=2*LB_t+B_t-W_t-2*LW_t$, where i=1,…4 refers to the number of the query (so that Q1b is the balance relative to the question Q1, etc.). Thus, in order to test the third psychological bias, for example, we regress (Q2b-Q4b) on a constant. A significantly positive intercept would mean that, ex ante, the respondent expects that his/her future economic condition (Q2b) will get systematically better (or less bad) than the economy-wide one (Q4b).

5. Empirical issues and results

5.1. Empirical issues

When categorical expectations and realizations referring to personal stances are compared the results, as argued by Manski (1990), may be misleading. The reason is that expectations reflect some location measure (mean, mode, etc.) of the individual's subjective distribution of the income change, the outcome is one draw from the actual income change distribution. Therefore, even if actual and subjective distributions coincide (i.e., if people are rational), the two categorical variables are not necessarily equal. A simple example makes the point forcefully. Assume that, as for the questions Q1 and Q2 (Section 4), individuals have just two option replies[18], say "better" (B) and "worse" (W). Suppose, then, 65% of the population think there is a 40% chance of the

[16] Although they are not-proper SFE, we refer to them as errors (gaps, discrepancies, etc.).
[17] This is how European Commission computes balances (European Commission, 1997). This makes it possible to save space. More disaggregated tests do not modify the overall picture (results available upon request).
[18] Das, Dominitz and van Soest (1999) extend the Manski critique to surveys with multiple qualitative reply options and alternative response models.

outcome W and 60% of B, whilst 35% think there is a 60% chance of it being W and a 40% chance of it being B. Hence, 35% will predict W and 65% will predict B. In the present context (Section 4), for the SFE to be zero the ex post distribution must be 35-65, too. However, if everyone has rational expectations (that is, if the subjective distributions of the future variables are correct) and there are no aggregate shocks (that is, realizations are independent of each other), then the realizations will be as follows: 47% (=0.65*40+0.35*60) will experience "worse" and 53% (=0.65*60+0.35*40) will experience "better". Therefore, with the data at hand, a persistent non-zero SFE may emerge even with rational expectations: how can we be sure that non-zero SFEs depend on psycho-biases only?

If anything, the Manski critique is weak in our context. First, it merely states that the SFE may be misleadingly different from zero. In contrast, we have a priori on i) the sign of the SFE, ii) the effect of hard times on it and iii) non SFE-based inconsistencies such as the last two psycho-distortions of Subsection 2.5. It is unlikely that evidence coherently supporting all the psychological implications be seriously affected by the critique. Moreover, when macroeconomic conditions are considered (questions Q3 and Q4, Section 4), all citizens will experience the same objective[19] realization (say, GDP growth). Thus, if rational, they should tend to have the same expectations about nationwide economic performances and, in our empirical framework, zero-SFEs should emerge.[20] Finally, as argued by Katona (1958), CCS should/could collect information on sentiments. Sometimes attitude changes conform with changes in income, sometimes attitudes change autonomously,[21] regardless objective developments. As Keynes (1936, pp. 161-162) put it: "most, probably, of our decisions to do something positive, (…) can only be taken as the result of animal spirits - a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities.". This is in stark contrast with the above mentioned concept of expectations formation based on the individual's subjective distribution. More in general, to the extent that replies reflect moods they are not statistically-based forecasts, the Manski critique loses force and the SFE can validly be addressed/interpreted via

[19] As mentioned in Section 2 the psychological approach, unlike economics, makes one wonder whether people suffer from biases even in backward-looking exercises.
[20] Graph. 1 compares the long run distribution of Europeans' replies on economic stances (Appendix A).
[21] In fact, this is the case in which CCS data may be very useful to forecasters of economic activity.

psychological arguments.

The intercepts that we analyze may be different from zero because of over-critical judgments and/or over-optimistic expectations; that is, the lack of an objective "hard" benchmark (e.g., GDP) implies that we can not establish whether people are more over-critical than overconfident. Moreover, we have no a priori on the relative magnitude of the biases: does the illusion of control affect expectations more than, say, the availability and media biases affect the retrospective reading of economic situations?

It is also useful to recall that we are examining i) percentages of respondents based on ii) qualitative reply options. As for the first item, it means that we have not individual-level data. Percentages of respondents are nonetheless useful to our aim. In fact, what we want to verify is whether a significant share of population has distorted judgments/expectations and, conditional upon that, whether the intercepts detected support psychological theories. To this end, individual-level data are not strictly necessary: when the evidence points to non-zero SFEs a significant share of respondents doubtless has distorted judgments/expectations. As for the qualitative nature of data, it is due to the fact that we are inspecting "adjectives" (worse, better, etc). Consequently, even with individual-level data, we would not know the precise magnitude of the gaps. Despite the fact that qualitative data have limited information content, they are not entirely worthless considering that our aim is to test widespread psycho-distortions. The presence of quantitatively very large individual-level intercepts, in fact, may lead to the detection of market-level ex ante/post incoherence even if the number of psychologically biased individuals is relatively (insignificantly?) low. When working with qualitative answers, by contrast, what we study is the share of individuals whose views on economic matters are psychologically driven, and hence are biased, not the average amount of their errors.

Last but not least, the proposed empirical procedure requires a careful treatment of standard errors (more details in Appendix B). For instance, we use monthly data on one-year forecasts. This naturally induces serial correlation – respondents will definitively know that their expectations are erroneous only twelve months after the initial projection, and overlapping same-sign errors are the likely outcome. Once again, this situation can be addressed even via psychological insights. From the psychological standpoint, indeed, conservatism may induce people to hold their expectations for

longer than warranted by objective computations (Section 2). In addition, it should be pointed out that measurement errors affect the disturbance of the regression at least by inflating it (Greene, 2002). All in all, a procedure to compute robust standard errors seems necessary.

5.2. Results

The results set out in Table 1 show that, over the last twenty years, the average SFE has been significantly different from zero in practically all European countries.

TABLE 1 ABOUT HERE

As well-known, few exceptions out of eighty regressions can occur just by chance, especially for the cases of zero SFE referring to the LB option reply. In fact, the LB-proportions have very small values and volatility.[22] This, together with the fact that figures are rounded up to the first decimal, implies that the data somewhat resemble to zero-one binary time series. All this clearly increases the probability of observing zero SFEs just by chance. More importantly, the overall picture strongly supports our psychological interpretation: we obtain both significant positive signs for LW and W and significant negative signs for LB and B. It also confirms existing findings based on genuine, but shorter and single-nation, panel data (Brown & Taylor, 2006; Das & van Soest, 1997; Das, Dominitz & van Soest, 1999; Mitchell & Weale, 2007; Souleles, 2004). Unluckily, and this holds for all our empirical results, data issues and disparate nation-wide objective developments prevent reliable cross section analyses. Although interesting, however, such analyses are outside the empirical scope of this paper.

TABLE 2 ABOUT HERE

[22] For instance, the sample mean for Spain is 2.8 for both $Q1\_LB_t$ and $Q2\_LB_{t-12}$ (hence the recorded β_{LB}=0.0 in Table 1) with a standard deviation of, respectively, 1.2 and 1.3. This is perhaps why other CCS allow only the replies "better" or "worse" without any other qualification (such as "a lot", "a little" and the like). To be noted on passing is that the number of "a lot worse" replies is, on average, much higher than that of "a lot better" throughout Europe – is there no (psychological?) limit to the Worse? (see also footnote 10).

As regards the second psychological implication stated in Subsection 2.5, not reported here are all the four possible combinations[23] (β_{LW} v β_{LB}, β_{LW} v β_{B}, etc.). This saves space and, more importantly, it avoids the drawbacks arising from the presence of dichotomic proportions affecting the LB option reply. The results set out in Table 2 show that people's forecast errors on the economic stance are structurally larger in hard than in good times. This finding is consistent with the interplay between prospect theory and illusion of control: after a negative shock giving rise to bad judgments people's expectations become more over-optimistic, and their SFEs consequently become larger. This evidence confirms the results reported for the UK by Mitchell and Weale (2007).

As mentioned, we also perform tests on non-proper SFEs. In particular, psychological arguments suggest testing whether:[24]

- (Q1b-Q3b)>0. If this is verified, then the respondent judges ex post that his/her financial condition (Q1b) has, on average, got better (or less bad) than the economy-wide one (Q3b). This is compatible with the backward-looking pessimism stemming from the media and availability biases, which especially affect beliefs on macroeconomic conditions.
- (Q2b-Q4b)>0. If this is verified, then the respondent expects that her future economic condition (Q2b) will get systematically better (or less bad) than the economy-wide one (Q4b). This tests the third psychological implication and it is implied by the illusion of control.
- (Q2b-Q1b), (Q4b-Q3b)>0. If these are verified, the respondent believes that the next year will always be more bullish (or less bearish) than the last one as far as, respectively, personal and general economic stances are concerned. This allows the fourth psychological implication to be tested and it stems from both illusion of control and availability/media biases.
- (Q2b-Q3b)>0. This is a sort of "mini-max" overall test: all the psycho-distortions here studied minimize the magnitude of the balance Q3b and maximize that of

[23] Some insights can be obtained by comparing the intercepts reported in Table 1. For instance, it is evident that, conditional on a large and positive β_{LW} (or β_{W}), a negative β_{LB} (or β_{B}) in all likelihood supports the psychological suggestions emphasized. Table 1 shows that this event frequently happens.

[24] $Qib_t=2*LB_t+B_t-W_t-2*LW_t$, where i=1,…4 refers to the number of the question. So, e.g., Q1b is the balance relative to the question Q1 (Section 4).

Q2b. Accordingly, this gap should show the greatest values.

TABLE 3 ABOUT HERE

Table 3 shows that there is no (quasi) exception to psychological arguments. By contrast, these results are hard-to-interpret in the light of objective statistical computations: although they refer to different years, ex ante and ex post perceptions on yearly developments should tend to be self-consistent over time. For instance, the significantly positive intercepts obtained for (Q1b-Q3b) and (Q2b-Q4b) imply that the average citizen judges, and expects, that his/her particular situation has got, and will get, systematically better than that of "his/herself". More in general, and according to the findings of cognitive psychology, the data exhibit that Europeans relentlessly repeat the following mantra: "as usual, it has got worse than I expected. Especially for the others. Nevertheless, I still think that it will get better. Especially for me.".

6. Concluding remarks

In this paper we have examined consumer confidence surveys data across ten European countries. We have compared average values of the differences between prospective vs. retrospective as well as personal vs. general views on economic stances over almost three hundred months. A systematic pattern has emerged whereby lay people's replies are incoherent from an objective, statistical, standpoint. We have argued that the issues stemming from the Manski critique, macroeconomic shocks and the lack of re-interviews may affect the results, if any, only partially and occasionally. Owing to the unique time/space dimension of the dataset, in fact, it is likely that their potential effects have not significantly perturbed our findings. In any case, they cannot totally explain our unequivocal record on the enduring presence of a nonrandom structural framework permeating the data.

In contrast, we have shown that cognitive psychology offers a fully comprehensive reading of the overall evidence. Psychological biases such as illusion of control, availability bias, etc., are natural traits. It comes as no surprise to find that they emerge as statistically significant intercepts when the enduring information content of long-

lasting surveys, aimed to capture the average citizen, is analyzed. On the other hand, psychologists put forward a large number of competing theories on human behavior. In the absence of an agreed-upon paradigm, empirical analyses are paramount, and our findings are based upon a dataset with an unparalleled time/space dimension. Addressing CCS data via cognitive psychology, therefore, may be useful for both economists and psychologists.

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Appendix A. Data: definitions and distributions.

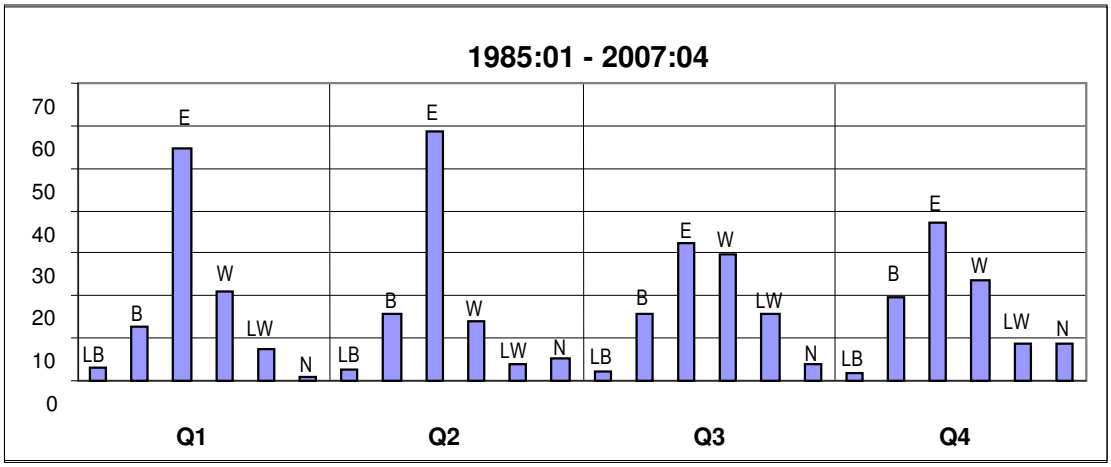
Participants in the survey are asked the following questions, which are harmonized in all countries according to the EU guidelines (European Commission, 1997, 2007):

Q1=How has the financial situation of your household changed over the last 12 months? It has ...
Q2=How do you expect the financial position of your household to change over the next 12 months? It will ...
Q3=How do you think the general economic situation in the country has changed over the past 12 months? It has ...
Q4=How do you expect the general economic situation in the country to develop over the next 12 months? It will ...

LB=got/get a lot better;
B=got/get a little better;
E=stayed/stay the same;
W=got/get a little worse;
LW=got/get a lot worse;
N=don't know.

LB, B, E, etc. are the percentage of respondents having chosen the corresponding option so that LB+B+E+W+LW+N=100.

Graph. 1. The long run distribution of Europeans' replies on economic stances



Note: Histograms report average values (%). Europeans=Belgium, Germany, Ireland, Greece, France, Italy, Finland, Spain, The Netherlands, UK. Starting date for Spain 1987:06, for Finland 1988:11.

Appendix B. Econometric Methodology: computing robust standard errors.

A critical component of the proposed empirical approach is the variance-covariance matrix of OLS parameter estimates. This is addressed it via the covariance estimator proposed by Newey and West (1987), which is robust to both heteroskedasticity and autocorrelation of unknown form (NW-HAC). The present setting calls for this correction. For instance, we use monthly data on one-year forecasts. This naturally induces serial correlation – respondents will definitively know that their expectations are erroneous only twelve months after the initial projection, and overlapping same-sign errors are the likely outcome. Once again, this situation can be addressed even via psychological insights. From the psychological standpoint, indeed, conservatism may induce people to hold their expectations for longer than warranted by objective computations (Section 2). As for heteroskedasticity, it should be pointed out that measurement errors affect the disturbance of the regression at least by inflating it (Greene, 2002). Clearly, a robust procedure increases the reliability of the outcome. As well known, the NW-HAC covariance estimator needs long-lasting samples and this is another reason why we prefer countries for which full-sample data is available (Section 3).

That said, consider the general regression model (k-dimensional regressor x_i with coefficient vector β)

$$y_i = x_i^T \beta + u_i \quad (i=1,\ldots,n) \text{ or, in matrix notation, } y=X\beta + u. \tag{3}$$

The covariance matrix is usually denoted in one of the following ways:

$$\Psi = \mathrm{VAR}[\beta] = (X^TX)^{-1} X^T\Omega X(X^TX)^{-1} \tag{4}$$

$$= (n^{-1}X^TX)^{-1}X^Tn^{-1}\phi(n^{-1}X^TX)^{-1} \tag{4a}$$

where $\mathrm{VAR}[u] = \Omega$ and $\phi = n^{-1}X^T\Omega X$. ϕ =is essentially the covariance matrix of the scores or estimating functions $V_i(\beta) = x_i (y_i - x_i^T \beta)$. The estimating functions evaluated at the parameter estimates $\overline{V}_i = V_i(\overline{\beta})$ have sum zero. For inference in the linear regression model, it is essential to have a consistent estimator for Ψ. What kind of estimator should be used depends on the assumptions about Ω. In the classical linear model independent and homoskedastic errors with variance σ^2 are assumed, yielding Ω

$= \sigma^2 I_n$ and $\Psi = \sigma^2 (X^T X)^{-1}$, which can be consistently estimated by plugging in the usual OLS estimator $\overline{\sigma}^2 = (n-k)^{-1} \sum_{i=1}^{n} \overline{u}^2$. As noted, instead, in the present context Ω is likely to be both not diagonal (i.e. errors may be autocorrelated) and/or have non constant diagonal elements (i.e. errors may be heteroskedastic). If the form of heteroskedasticity and autocorrelation is unknown, a solution is to estimate ϕ instead of Ω. Newey and West suggest computing $\overline{\psi}$ by plugging, into equation (4a), the following: $\overline{\phi} = n^{-1} \sum_{i,j=1}^{n} w_{|i-j|} \overline{V}_i \overline{V}^T_j$ where $w=(w_0, \ldots, w_{n-1})^T$ is a vector of weights. A reasonable assumption is that the autocorrelations should decrease with increasing lag $l = |i-j|$. Otherwise, in fact, β can typically not be estimated consistently by OLS. So, the weights w_l should also decrease. We follow the suggestion of Newey and West by i) using linearly decaying weights, $w_l = 1 - l/(L+1)$, where L is the maximum lag, and ii) setting[25] $L=4=\text{floor}[4(n/100)^{2/9}]$.

[25] Correlograms, not reported, confirm that this choice is palatable. Floor=largest integer.

Table 1. Size of forecast errors

		Per	Gen				Per	Gen
BELGIUM	β_{LW}	6.1***	8.3***		ITALY	β_{LW}	6.6***	15.1***
	β_{W}	10.4***	3.9***			β_{W}	19.5***	9.0***
	β_{B}	-15.6***	-12.0***			β_{B}	-25.3***	-22.1***
	β_{LB}	-0.8***	-0.2			β_{LB}	-0.7***	-2.0***
GERMANY°	β_{LW}	4.2***	6.9***		FINLAND	β_{LW}	5.3***	5.9***
	β_{W}	3.3***	-3.6			β_{W}	7.3***	0.8
	β_{B}	-7.7***	-4.3*			β_{B}	-12.9***	-7.5***
	β_{LB}	0.2	**1.0*** **			β_{LB}	0.3	0.8***
IRELAND	β_{LW}	5.3***	7.0***		SPAIN	β_{LW}	6.0***	5.4***
	β_{W}	6.5***	**-3.3** **			β_{W}	13.5***	7.6***
	β_{B}	-12.6***	-7.5***			β_{B}	-19.6***	-13.5***
	β_{LB}	0.7***	3.8***			β_{LB}	-0.0	0.5***
GREECE	β_{LW}	1.9	0.4		NETHERLAND	β_{LW}	7.5***	7.5***
	β_{W}	14.1***	16.7***			β_{W}	**-2.5*** **	**-6.1** **
	β_{B}	-15.0***	-15.3***			β_{B}	-7.8**	-5.8***
	β_{LB}	-1.0***	-1.7***			β_{LB}	**2.8*** **	**4.4*** **
FRANCE	β_{LW}	9.4***	12.5***		UK	β_{LW}	8.0***	9.3***
	β_{W}	10.2***	3.1***			β_{W}	4.6***	4.3***
	β_{B}	-17.3***	-14.7***			β_{B}	-12.9***	-13.0***
	β_{LB}	-2.3***	-0.9***			β_{LB}	0.2	-0.6*

Note. Sample 1985:12 – 2007:04 (starting date for Spain 1987:06, for Finland 1988:11). Reported values are the intercepts of Per=$(Q1\_Z_t\text{-}Q2\_Z_{t-12})=\beta_{Z\_Per}$; Gen=$(Q3\_Z_t\text{-}Q4\_Z_{t-12})=\beta_{Z\_Gen}$. (Z=LW, W, B, LB). Percentages are rescaled: Z=100*Z/(100-E-N). Q1=How has the financial situation of your household changed over the last 12 months? It has...Q2=How do you expect the financial position of your household to change over the next 12 months? It will...Q3=How do you think the general economic situation in the country has changed over the past 12 months? It has...Q4=How do you expect the general economic situation in the country to develop over the next 12 months? It will...LB=got/get a lot better; B=got/get a little better; W=got/get a little worse; LW=got/get a lot worse. ***=p-value<1% (**<5%, *<10%) with Newey-West robust standard errors. The answer is "Yes" if β_{Z_Gen} and β_{Z_Per} are significantly positive for Z=LW, W and significantly negative for Z=LB, B. Results significantly rejecting the presence of psycho-biases are in bold.

° As mentioned (Section 3), data for Germany suffer from the country's reunification. We consequently ran regressions starting from January 1992. Few parameters substantially changed: β_{W_Gen}=0.1; β_{LB_Per} = -0.4*; β_{LB_Gen}=0.2.

Table 2. Size of forecast errors when predictions were pessimistic

	β_{Per}		β_{Gen}		β_{Per}		β_{Gen}
BELGIUM	32.9***		24.4***	**ITALY**	52.1***		48.2***
GERMANY	15.0***		6.6	**FINL.**	25.2***		13.4***
IRELAND	23.7***		7.4*	**SPAIN**	39.1***		26.0***
GREECE	32.0***		34.1***	**NETHERL.**	10.0***		2.8
FRANCE	39.2***		31.2***	**UK**	25.3***		27.2***

Note: Positive values=Yes. $\beta_{Per}=\beta_{LW\_Per}+\beta_{W\_Per}-(\beta_{LB\_Per}+\beta_{B\_Per})$; $\beta_{Gen}=\beta_{LW\_Gen}+\beta_{W\_Gen}-(\beta_{LB\_Gen}+\beta_{B\_Gen})$. Other details under Table 1.

Table 3. Differences in responses to personal and general economic situation questions

	Q1b-Q3b	Q2b-Q4b	Q2b-Q1b	Q4b-Q3b	Q2b-Q3b
BELGIUM	33.3	21.8	15.5	27.0	48.8
	3.64	2.33	0.64	2.37	3.70
GERMANY	22.8	18.1	11.1	15.8	33.9
	3.69	2.04	1.21	2.99	4.41
FINLAND	**7.4**	**4.0**	10.7	14.1	18.1
	5.51	**3.20**	0.93	5.87	5.90
GREECE	7.06	***2.65***	23.6	28.0	30.7
	1.55	***1.55***	0.93	1.69	1.72
SPAIN	14.8	11.0	17.8	21.6	32.6
	2.86	1.46	0.91	2.83	3.37
FRANCE	51.4	31.9	17.4	37.0	68.9
	2.55	1.75	0.51	1.96	2.75
IRELAND	***3.46***	8.14	18.9	14.2	22.3
	5.14	2.51	1.41	4.73	5.98
ITALY	41.4	14.0	23.7	51.1	65.1
	3.12	1.76	1.65	3.62	3.91
NETHER.	13.6	14.9	7.46	***6.16***	21.1
	6.18	3.79	1.72	***5.02***	6.64
UK	32.1	22.5	20.0	29.7	52.2
	3.00	2.56	1.11	3.44	3.57

Note: Positive values=Yes. $Qib_t=2*LB_t+B_t-W_t-2*LW_t$, where i=1,…4 refers to the number of the query (so, Q1b is the balance relative to question Q1, etc.). For each country, the first row reports the mean value of the corresponding difference between balances; Newey-West robust standard errors are reported in the corresponding second row. Insignificant values in bold. The tests can be read as follow: (Q1b-Q3b)>0 implies that people judge their financial condition as having got systematically better (or less bad) than the economy-wide one. This is consistent with the availability and media biases. (Q2b-Q4b)>0 implies that people expect that their future economic condition will be systematically better (or less bad) than the economy-wide one. This is consistent with the presence of illusion of control. (Q2b-Q1b) and (Q4b-Q3b)>0 imply that people expect that, respectively, both personal and general next-year financial conditions will get systematically better (or less bad) than those of the previous year. This is consistent with both the illusion of control and availability and media biases. That said, it should be clear that (Q2b-Q3b) refers to a sort of "mini-max" overall test and that, according to the psycho-biases under scrutiny, it should show the greatest positive values.