Department of Economics

Understanding Individuals' Beliefs

Paulina Andrea Granados Zambrano

Thesis submitted for assessment with a view to obtaining the degree of Doctor of Economics of the European University Institute

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EUROPEAN UNIVERSITY INSTITUTE
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Jury Members:

Prof. Luigi Guiso Supervisor, EUI
Prof. Andrea Ichino, University of Bologna
Prof. Eleonora Patacchini, Università di Roma "La Sapienza"
Prof. Andrea Repetto, Adolfo Ibañez University, Chile

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Part I

Introduction

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We live in a world surrounded by uncertainty and within this uncertainty human beings have to decide every action, every turn of life. “To be or not to be, that is the question” is the starting line of Hamlet´s musings (Shakespeare, 1602) contrasting the pain of life with the fear of the uncertainty of death. Hamlet’s dilemma exemplifies the relevance of beliefs, in his case about the consequences of death, determining individuals’ actions, Hamlet’s decision about to live or to die. When individuals take decisions the true value of parameters relevant for that decision are usually unknown and rarely important *ex-ante*. The final outcome, realized *ex-post*, indeed depends on the true parameters, but the decision does not. It usually depends just on the beliefs individuals have about these parameters. The aim of this dissertation is to contribute to a better understanding of the formation of individuals’ beliefs under realistic economic environments.

The neoclassical approach of decision making has been widely challenged by behavioral economics during the last century. The simplified assumptions of the neoclassical approach (rational individuals with well behaved preferences), even though useful given the framework from a normative point of view, add tractability to the analysis to the detriment of really explaining observed human behavior. This research relies on the recognition that behavioral economics “increases the realism of the psychological underpinnings of economic analysis, improving economics on its own terms: generating theoretical insights, making better predictions of field phenomena and suggesting better policy” (Camerer, Loewenstein and Rabin, 2003). The new paradigm opens novel perspectives to better understand individuals’ behavior.

The complexity of human behavior was noticed at an early stage in an economic context by Adam Smith in “The Theory of Moral Sentiment” (1759)[1]. Smith built a pluralistic approach to morality based on a multitude of psychological motives. He explains the observed behavior of human beings as the struggle between their “passions” and the “impartial spectator”. These “passions” refer, for example, to basic biological needs,

[1] See Ashraf, Camerer and Loewenstein (2005) for a deeper analysis of Smith’s influence on modern Behavioural Economics.

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emotions, feelings, hopes, expectations; anything that could trigger a human reaction. The role of the “impartial spectator”, from Smith’s point of view, is to guide individuals to behave by following the rules of morality. Smith states the “perfection” of human nature is the ability to “self-command” our “ungovernable passions” through virtuously sympathizing with others. Even at this early stage, Smith presaged many insights that have later appeared in the literature and this thesis also highlights some important of his early observations.

Smith was a pioneer in noticing the intertemporal choice and self-control of human beings: "The pleasure which we are to enjoy ten years hence interests us so little in comparison with that which we may enjoy today, the passion which the first excites, is naturally so weak in comparison with that violent emotion which the second is apt to give occasion to, that the one could never be any balance to the other, unless it was supported by the sense of propriety." Smith also discussed the overconfident nature of individuals, noticing that "the chance of gain is by every man more or less over-valued, and the chance of loss is by most men under-valued, and by scarce any man, who is in tolerable health and spirits, valued more than it is worth." Specifically related to performance, he commented about the "over-weening conceit which the greater part of men have of their own abilities." These two observations, the self-control problem and the recognition of overconfidence, are central to Chapter 1. The last two chapters of this thesis are related to Smith´s discussion regarding Social Preferences. The central forces determining a given social output would strongly depend on the degree of “sympathy” among individual, citizens, nations, etc. Smith believed that humans have a natural tendency to care about the well being of others for no other reason than the pleasure one gets from seeing them happy. It is logical to also infer that this sympathy at an aggregate level (social preferences) could materialize in beliefs about social outcomes that affect societies as a whole. Chapter 2 deals with the determinants of aggregate beliefs and, even though not explicitly discussed by Smith, with the dynamics of beliefs over time. Chapter 3 explores the determinants of trust or, in Smith´s words, “mutual sympathy”.

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The recognition that information is, most of the time, incomplete and imperfect is essential in understanding the nature of the formation of beliefs. Information matters in the formation of beliefs and so also, for decision making. In the first stage, I am interested in knowing how people deal with available information to update beliefs. One important branch of individual decisions is that of human capital accumulation, where one of the key variables for the investment decision is the individual's ability. It is important to realize the agent never knows his/her true ability. He/she only has an *ex-ante* notion of his/her believed ability and the truth is only revealed *ex-post.* Once the true ability is known and the payoffs realized, we observe different reactions that range from disappointment to happiness. The logical question is then, who would have preferred not to know the truth? **Chapter 1** deals with the information acquisition decisions of individuals who face uncertainty about their own ability. At a theoretical level (Bénabou and Tirole, 2002), it has been shown that overconfident individuals (people with beliefs about themselves higher than reality) with time inconsistent preferences have more at stake when they face the decision of learning the truth about themselves than more pessimistic agents. To test this prediction, I design a field experiment where students face the decision of learning, or not, their true ability before performing a test. It will be shown that overconfident students indeed more often decide not to learn their true ability.

It is also important to notice that the formation of beliefs is a dynamic process, where the relevance for decision making is especially important when related to social outcomes. The support politicians get is strongly connected to the beliefs of citizens. Democratic leaders around the world would have never been elected if people would have not believed in them and in their promises. I am interested in exploring what affect aggregate beliefs and their dynamic over time. **Chapter 2** explores the dynamics of beliefs with respect to the benefits of the introduction of the single currency (Euro) in Europe. I propose a framework where the formation of beliefs is the result of the interaction between demand (intrinsic motivation) and supply forces (interested actor manipulating individuals' beliefs). The main result supports the existence of more optimistic beliefs during both the dates of the introduction of the Euro (the non-physical introduction in 1999 and the physical introduction in 2002) with respect to the period before and the period after the implementation. There is empirical evidence of demand forces, specifically self-serving

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beliefs, in the neighborhood of the implementation dates, reflected in the higher impact of these forces diminishing the probability of being against the Euro. The most relevant effect after the physical introduction of the Euro in 2002 is the diminished impact of supply side forces (interested actors). However, there is an increased role of European institutions in sustaining the credibility of the Euro among citizens, especially after the physical implementation of the single currency in 2002.

Finally, **Chapter 3** explores the determinants of trust in order to better estimate the causal effect of trust on social efficiency. This is an issue closely related to Smith's statement concerning "mutual sympathy" among human beings, as previously discussed. The main problem when estimating the effect of trust on social efficiency is the weak specification of the relevant causal relationship. Whilst it may be true that trust can facilitate cooperation and, as a result, social efficiency it may be equally valid that efficient social institutions promote trust. The reverse-causality problem, which leads to spurious coefficient estimates, is addressed by introducing an innovative set of instruments for trust from the field of neuroeconomics, as research in this area has shown that the levels of oxytocin in the brain facilitate trusting behavior among humans. Following Zak and Fakhar (2006), proxy measures for levels of these neuroactive hormones are used to instrument for trust. The depurated effect is higher than in previous research, emphasizing the relevance of trust in increasing the efficiency of social organizations.

To understand the mechanisms behind the formation of individuals' beliefs is the key ingredient in better understanding human behavior. This thesis attempts to empirically contribute to this research in economics from a positive point of view and to bring the evidence for further normative analysis.

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Part II

Chapters

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Chapter 1: *I prefer not to know!* Analyzing the decision of getting information about your ability

1.1 Introduction

Is information always valuable for the decision making process, as it is in classical decision theory? This question is easily answered when the decision makers are fully rational individuals maximizing a *well-behaved* utility function with uncertain inputs. Information about the unknown is indeed always valuable in this setting. However, when individuals exhibit time inconsistent behavior (for example, hyperbolic preferences) with incomplete and imperfect information, access to information can damage more than help during the decision making process for certain types of people. This heterogeneity amongst individuals is related to how close/far are their beliefs about states of the world, which are relevant for their utility functions, from the truth. If the relevant state of the world for the decision making is the ability of the individual, when his believed ability is above his *true* ability, we observe overconfidence. Bénabou and Tirole (2002) emphasizes the theoretical detrimental effect of information about true ability when performing a task for overconfident individuals with time inconsistent preferences. In this chapter, I design and implement a *field*[2] experiment to test this hypothesis in order to provide supporting empirical evidence.

This chapter builds on three hypotheses. First, most of the information about fundamentals in the real world is unknown or partially known. Information is not perfect or complete. Second, individuals have beliefs about these fundamentals which are relevant to their decision making process. Therefore, decisions are made based on beliefs when accurate information is not available. Third, in a variety of situations individuals exhibit time inconsistent preferences. Bénabou and Tirole (2002) provides a theoretical model showing

[2] I used the word "field" to emphasis the experiment was applied to students in standard Universities, not to a social laboratory using volunteers. However, the key element of field experiments is not present in the setting here, i.e. the introduction of exogenous variation.

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that overconfident people (i.e. people whose beliefs are 'better' than the truth) prefer not to get information about their true ability when they have the option to decide. The key crucial assumptions for this prediction are the time inconsistent nature of human beings and the recognition of heterogeneity across individuals in their believed confidence. The authors model the self-control problem of an individual with hyperbolic preferences that has to decide whether or not to learn his true ability before performing a task. Utility depends directly on ability. They provide theoretical support for the trade-off between *the risk of overconfidence* (engaging on a project when you are not capable enough to succeed) and *the self-confidence maintenance* (abandoning the project even though *a priori* you are capable enough to succeed). When the self-confidence maintenance motive is big enough the individual prefers not to know his true ability. This happens only for overconfident individuals. Information, then, is not always valued as it is in classical decision theory. On the other hand if the person is under-confident (accurate), information is always valuable (neutral). Moreover, if the assumption of time inconsistent preferences is ignored, the heterogeneity on believed confidence is irrelevant and information is always valuable.

The contribution of this chapter is the design and implementation of a *field* experiment in the area of education to test the predictions of the Self Control model by Bénabou and Tirole (2002). The sample consists of students from standard taught courses at undergraduate or postgraduate level. The structure of the course has to have (at least) one test accounting for X% of the final score and a (1-X)% final exam. The official information rule and common knowledge is that the result of the test(s) is not revealed until the final exam has been taken. The experimental setup is the following: immediately after the X% test, students are given the option to decide if they want to privately learn the score they got in test X% immediately before (minutes) the final exam (or the next test). Given the student knows how much he studied and the difficulty of the X% test they just performed, I assume that the score is a good private signal to proxy for ability. According to the Bénabou and Tirole model, we would expect overconfident students to decide more often not to learn the result of the preceding test. A general questionnaire is applied to all the students of the class during the term. The most important measures to classify the students by their degree of overconfidence will be extracted here. Also, individual characteristics like age, gender and degree of risk aversion are collected.

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In practice, to finally provide the feedback to the students according to their stated preferences was not possible because of Institutional rules. Immediately after the test corresponding to the X% of the final degree, the professors did communicate that the result of the test could not be revealed until the next test (or final exam). Therefore, the students had the option to decide on the information structure in advance. Students were asked to answer a small questionnaire in which they had to state whether or not they wanted to privately learn the result of the actual test immediately before the next test. With this information, and as the setting required, the professor would then reveal the scores accordingly. In the next lecture, the professor apologized and communicated that the rules of the Institution with respect to the partial scores had to be applied (in general, students have the right to learn their scores weeks in advance the next test, for pedagogical reasons). Therefore, at the end the rules of the Institution were not modified, but the students stated their preference for knowing or not their *true ability* believing they had the option to decide, exactly the behavior I wanted to catch.

The experiment was applied to 282 undergraduate students during the Spring term 2009 (September-December) in Santiago, Chile. They came from compulsory courses in **Chemistry (1st year), Statistics** and **Economics (4th year)** in the Engineering Faculty of the University of Chile; and compulsory **Micro-** and **Macroeconomics** courses (2nd and 3rd year) at *Universidad Diego Portale*s. The result supports the prediction that the decision of learning the true ability is decreasing in the degree of overconfidence: the more overconfident, the less the students were likely to want to learn their previous score before the next test.

Information on overconfidence and other characteristics was also collected for 473 additional students, corresponding to five parallel Chemistry classes in the Engineering Faculty of the University of Chile, Spring term 2009. Score records for most of these classes, in addition to the classes in the experiment, were also available. The scores students obtain in their respective classes are a mix of ability and effort, which are impossible to disentangle under this setting. Therefore, to look for the causal effect of overconfidence on performance would give spurious results. In any case, the result of no correlation between performance and overconfidence is interesting.

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This chapter is organized as follows. Section 1.2 discusses the literature relevant for the present research. Section 1.3 develops the model from Bénabou and Tirole (2002), adding the analysis for different degrees of risk aversion. Section 1.4 presents the experiment design and the details of the implementation. Section 1.5 describes the data collected and some important sample statistics. Section 1.6 presents the main results and Section 1.7 concludes.

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1.2. Literature Review

The empirical question analyzed in this chapter relies on three fundamental pillars of decision making analysis in modern economics.

The first is the recognition that human behavior does depart from the *homos economicus* standard. The interrelation between psychology and economics has been widely developed during the last decades. The predictions coming from fully rational individuals and well-behaved preferences have been challenged by an increasing number of authors. Behavioral economics amends the assumption of fully rational agents and takes seriously the malleability of human beliefs. Gleaser (2004) states that "the promise of economics and psychology is that the tools of economics can predict the extent that beliefs and preferences are manipulated in the market".

Beliefs are relevant for decision making because information is imperfect and incomplete most of the time. The information acquisition process to update beliefs has exogenous and endogenous components. Individuals are supposed to deal optimally with the information they have access to, costly or not. This is the second key element of the present research framework: the information acquisition process under uncertainty is essential for the utility maximization process.

There are many examples from psychology supporting the idea that individuals indeed manipulate at their convenience (or *believed* convenience) the information to update beliefs about personal characteristics. Thus, Bénabou and Tirole (2001) puts together observational findings in psychology to better understand their main economic implications. The paper is able to give formal content to individuals' traits such as self-confidence, intrinsic motivation, dependence/autonomy and power of will, as well as to cognitive processes such as wishful thinking or selective memory, self monitoring and the setting of personal rules. It departs from the typical rational economic agent allowing for imperfect self-knowledge, imperfect willpower and imperfect recall. Specifically, imperfect self-knowledge refers to the uncertainty that people face about their own abilities and even preferences, which could exert some behavioral bias toward instant gratification. Imperfect willpower reflects the fact that people do not always act in their best interest, therefore self-

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destructive behavior and also time inconsistent preferences are allowed. Finally, imperfect recall takes into account that memory is imperfect, attention is limited and awareness can therefore only be selected. At the same time, Bénabou and Tirole (2001) maintains the classical approach with the intertemporal utility maximization problem the individual has to solve when choosing an action, i.e., the agent tries to do what is best for himself given his current (often inaccurate) perception of his own interests and abilities. The skepticism with respect to the messages of others and one's own memories or rationalizations is represented by Bayes' rule. It is under this framework that self-confidence emerges as a valuable asset in the decision making process.

Bénabou and Tirole (2002) derives important implications on how agents process information and make decisions. It highlights the importance of self-confidence for the individual decision making process via three channels: *consumption value* in the sense that self-image is included simply as another argument of the utility function; *signaling value* because if you really think you are "good" (or a "high type" in the typical task-effort agent problem) you can more easily convince others of this; *and motivation value* in the sense that self-confidence improves individuals' motivation to undertake projects and persevere in the pursuit of their goals, in spite of the setbacks and temptations that periodically test their willpower. The authors emphasize this last channel because of its substantially broader explanatory power. More particularly, the motivation value channel yields an endogenous value of self-confidence that responds to the situations and incentives the individual faces, in a way that can account for both "can-do" optimistic beliefs about themselves and others, and "defensive" pessimism.

There is evidence of heterogeneity across individuals' beliefs on a variety of topics. Bénabou and Tirole (2006) develops a theoretical framework to explain why most people need to believe in a just world (*you get what you deserve, effort pays,* etc.). The paper argues that differences in the valuation of these beliefs across countries and their prevalence could explain important international divergences in aggregate macroeconomic variables. I would like to emphasize this *need* to believe which, implicitly, makes reference to a characteristic of human beings that is going to be the third pillar of this research.

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It has been observed that individuals are sometimes willing to sustain false (or inaccurate) beliefs about themselves, even though accurate information is available. Gleaser (2004) claims that, given the psychological evidence of malleability of human perceptions and emotional states, decisions are made based on local influences more than on long-run wellbeing. He discusses an economic model of false beliefs and the implications for their prevalence, where beliefs are the result of external and internal influences. In the present research we are interested in the beliefs that individuals sustain about their perceived ability and how they deal with the available information to update these beliefs, to become closer (or not) to the truth. Bénabou and Tirole (2002) provides a theoretical model showing that overconfident people (i.e. people with beliefs about themselves above the truth) prefer not to get information about their true ability when they have the option to decide. The third pillar of the present research is the recognition of heterogeneity across individuals in their believed confidence with respect to the truth. Therefore, the time inconsistent nature of human beings under uncertainty and their different degree of overconfidence imply different responses in the information acquisition problem. The model that forms the basis of the experimental setting, the Self Control Problem, is developed in detail in the next section.

Confidence can be understood in terms of the feeling of certainty about a state of reality. The strength of this feeling is what it is known as confidence (Pulford, 1996). Self-confidence refers to how certain we are about our own ability in different situations. In this context, overconfidence appears when your predicted ability is higher than in reality. One of the manifestations of overconfidence, relevant for this study, is *miscalibration*[3].

At the empirical level, research in psychology has focused on how to properly measure overconfidence (West and Stanovich, 1997; Pulford, 1996; Klayman et al, 1999; among others). The main conclusions are that on average people have a tendency towards overconfidence, that there is a lot of heterogeneity in confidence across individuals, that overconfidence increases with the difficulty of the task and that there is apparent domain specificity in confidence judgments.

[3] The other most common manifestations of overconfidence relevant to economics are known as the "better than average" effect and the "illusion of control" (Deaves, Lüders and Luo, 2009).

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Empirical research in economics has mainly studied the impact of overconfidence on economic outcomes. The main result is that overconfidence does matter. For example, based on a controlled asset experiment, Deaves, Lüders and Luo (2009) provides evidence of additional trade gathered by overconfidence. Biais, Hilton, Mazurier and Pouget (2002) provides evidence supporting the idea that overconfident traders are expected to suffer particularly from the winner´s curse, as they tend to overestimate the precision of their signals. In fact, these traders are found to earn relatively low trading profit.

In a different context, closer to the one analyzed in the present study, Bandiera et al (2005) introduces the idea of overconfidence in an attempt to evaluate the impact of feedback on academic performance. This paper distinguishes theoretically between overconfident and underconfident students, showing the ambiguous *a priori* effect of feedback on effort (and then, in final performance) depending on the prevalence of the *motivation effect* versus *slacker effect*. They find robust evidence that feedback (about past performance) has an effect higher or equal to zero on final performance (or final score in taught postgraduate courses) over the whole distribution of ability. Therefore, under the feedback regime both underconfident and overconfident student should theoretically exert more effort that with no feedback. However, the paper does not have measures of students' overconfidence to check this result empirically. Even though the purpose of the paper is not to know which regime these different types of individuals would prefer if they had the option to decide, it is interesting to think about the different *a priori* theoretical answers to the question, given the degree of overconfidence.

In the area of behavioral finance, Guiso and Japelli (2006) empirically studies the information acquisition effect on portfolio performance. For rational investors, information is always beneficial and improves portfolio performance. However, for overconfident individuals, information could be detrimental. The introduction of overconfidence here accounts for investors systematically overestimating the value of the private signals. For this reason, they spent too much money and time acquiring information which leads to inefficient portfolio allocations. The time spent looking for financial information is shown to be negatively correlated with portfolio performance, supporting the hypothesis of overconfident investors. This effect is stronger for investors "suspected to be" more

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overconfident. There exists two main differences with my own research. First, the authors do not have a measure of overconfidence for each individual so they cannot properly measure the effect of overconfidence on information acquisition. They empirically observe a detrimental effect of information on portfolio performance which is consistent with the overconfidence hypothesis. Then, looking at variables that are supposed to be more frequently associated to overconfident investors, they conclude that the detrimental effect of information on portfolio performance is stronger the more overconfident the investor. Second, the variable for information is *time spent acquiring financial information*. They do not refer to the quality of information; they only state that whatever the quality of information, an overconfident investor tends to overstate its veracity. The investor does not have the option to know how far his believed signal is from the truth, which would be the equivalence with my research.

To my knowledge there is no empirical research analyzing the information acquisition decision about personal characteristics for individuals with different degrees of overconfidence. This study tries to take a first step in filling this gap.

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1.3. The Model

The basic model is developed by Bénabou and Tirole (2002), which provides theoretical support for the tradeoff between *the risk of overconfidence* (engaging in a project when you are not capable enough to succeed) and *the self-confidence maintenance* (abandoning the project even though, *a priori*, individuals are capable enough to succeed). This trade off becomes relevant when individuals are given the option to learn accurate information about their ability before performing a task where the associated utility depends directly on ability. When the self-confidence maintenance motive is strong enough, then the individual would prefer not to know his true ability. Overconfident people (individuals with believed ability higher than the truth) have more at stake when the true ability is revealed and therefore more often prefer not to learn their true ability. Additional to the theoretical conclusions of Bénabou and Tirole, I analyze the role of risk aversion given confidence. The value of information is declining in risk aversion: risk averse individuals would more often prefer not to know the truth.

Basic setting

Bénabou and Tirole (2002) analyzes a game that consists of three periods. In the first period (t=0) an agent has to decide the information structure about his ability at t=1 (θ=ability or probability of succeeding in a task when trying $\in [0,1]$). He decides between learning θ for sure or learning nothing than he did not know at t=0 (i.e. $F_1(\theta)=F_0(\theta)$ where $F_t(\theta)$ is the cumulative distribution ability function at date t). At t=1 the agent decides whether to undertake a project (or exert effort in a project). He is imperfectly informed about the probability of succeeding in a task when trying or, equivalently, about his ability θ. In the last period (t=2) information is revealed and payments realized.

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The payments associated with each period are given by:

$u_0 = 0$ The decision of the information structure for the next period is costless.

$u_1 = \begin{cases} -c \\ 0 \end{cases}$ if taking a project and exerting effort
if not

$u_2 = \begin{cases} \theta V \\ 0 \end{cases}$ if succeeding
if not

where *c>0* is the cost of effort (constant for simplicity), θ is the probability of succeeding if trying (or the ability of the individual), with Cumulative Distribution Function (CDF) $F_t(\theta)$, and *V>0* a constant. Note that there are complementarities between effort and ability: the higher one's ability in the activity, the stronger the incentive to undertake the project.

The player is a risk neutral student[4] and a collection of his incarnations per period of time. I call *Self-t* a student incarnation in time t. The individuals are utility maximizing agents with hyperbolic utility functions, to account for the salience of the present. Therefore, from the point of view of each Self, the intertemporal utilities/payoffs are given by:

$$U_0(\theta) = E_0\left(u_0 + \beta\delta u_1 + \beta\delta^2 u_2\right) = \beta\delta\left[-c + \delta\overline{\theta_0}V\right]$$
$$U_1(\theta) = E_1\left(u_1 + \beta\delta u_2\right) = -c + \beta\delta\overline{\theta_1}V$$
$$U_2(\theta) = u_2 = \theta V$$

$0 < \beta < 1$ reflects the momentary salience of the present and $0 < \delta < 1$ is a standard discount factor.

Solving the problem from the point of view of Self-0, the individual only undertakes the project if his belief about his expected ability is higher than a certain threshold, i.e. $E_0[\,\theta] \equiv \overline{\theta_0} \geq \frac{c}{\delta V}$

[4] The role of risk aversion is analysed later in this chapter.

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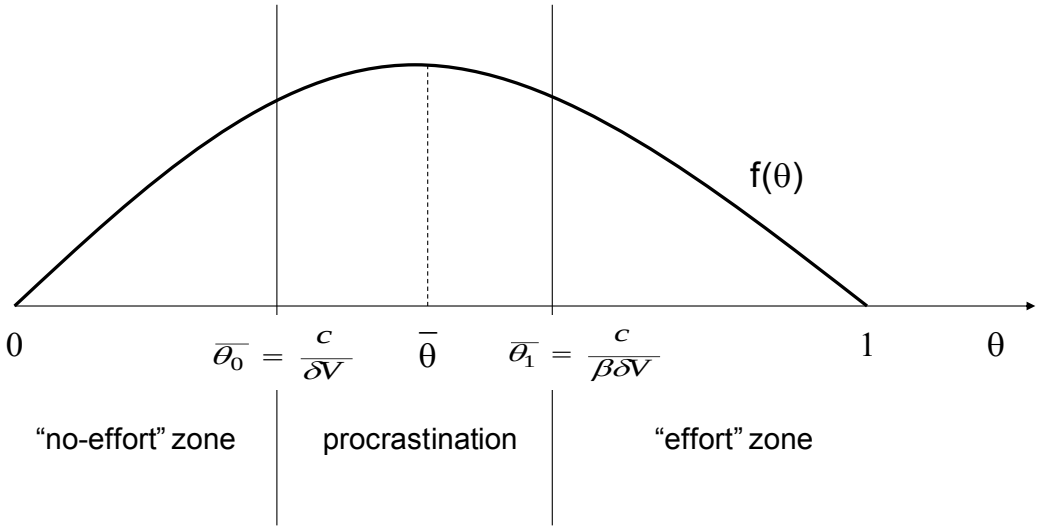
Solving the problem from the point of view of Self-1, the individual only undertakes the project if his belief about his expected ability is bigger than a certain threshold, with outcomes higher than the one solving Self-0 problem, i.e. $E_1[\theta] \equiv \overline{\theta_1} \geq \frac{c}{\beta\delta V}$.

Therefore, due to the time inconsistency of the game, there is a zone in the domain of ability where even though Self-0 was willing to exert effort (or undertake the project), when time passes Self-1 finds it optimal to procrastinate. Figure 1.1 shows this schematically.

Figure 1.1: The Self-Control Problem



Included in the diagram is a hypothetical distribution function of ability that generates an expected belief of ability equal to $\bar{\theta}$. In this case, the individual at time t=0 decides to exert effort but, at t=1 he procrastinates given that, from Self-1's point of view, it is no longer optimal to undertake the project. If the expected ability $\bar{\theta}$ would have been in the "effort" zone, the individual always exerts effort given that, for that value of ability, it is always optimal to undertake the project. Similarly, if the expected ability $\bar{\theta}$ would have been in the "no-effort" zone, the individual never exerts effort as for that value of ability it is always optimal not to undertake the project.

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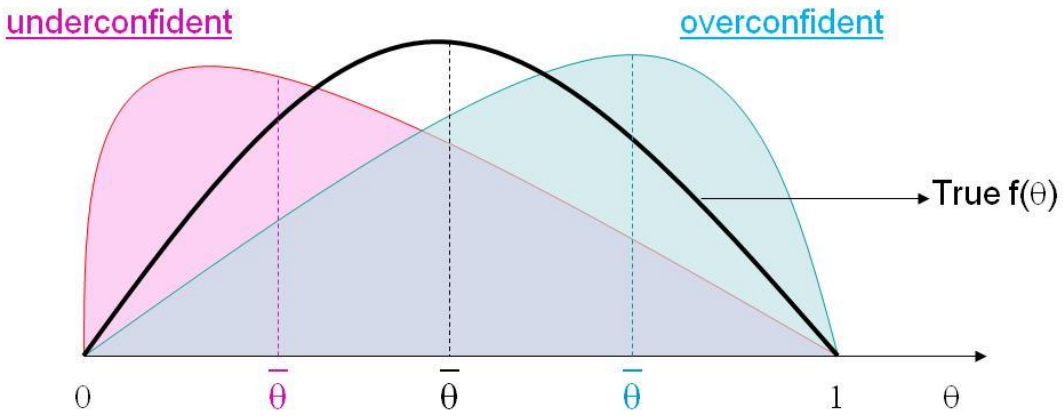
The value of Information

Remember that we are interested in the information acquisition decision at t=0, i.e. we want to know *what kind* of individuals are more willing to decide to learn their true ability before undertaking the project. As such, we introduce the concept of overconfidence, underconfidence and accuracy.

Confidence can be understood in terms of the feeling of certainty about a state of reality. The strength of this feeling is what it is known as confidence (Pulford, 1996). Self-confidence refers to how certain we are about our own ability in different situations.

In this context, overconfidence appears when you think your predicted ability is higher than it truly is in reality. Following the same logic, underconfidence appears when your expectation is below the truth (Figure 1.2). A well calibrated or accurate person would be the individual holding a belief about his ability similar to the truth.

Figure 1.2: Overconfidence, Accuracy and Underconfidence.



Notice that you *never know the truth* in the setting for the information acquisition decision. The only information you have are your beliefs about θ or, more specifically, the expected value of ability given your beliefs: $\bar{\theta} = \int_0^1 \theta dF(\theta)$.

Now we focus attention on the problem of an overconfident individual in the context of the game under analysis. Assume that the individual has beliefs about ability above $\frac{c}{\beta\delta V}$ while

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the truth is below. The individual thus thinks he is inside the "effort" zone. Therefore, without information, it is always optimal to exert effort. The value of information for this individual will be given by:

$$I_F(overconfidence) = \beta\delta\left[\int_0^{\frac{c}{\delta V}}(c-\delta V\theta)dF(\theta) - \int_{\frac{c}{\delta V}}^{\frac{c}{\beta\delta V}}(\delta V\theta - c)dF(\theta)\right] \equiv \beta\delta\left[G_F - L_F\right]$$

The first term (G_F) contains the gain from being informed. If the true ability of the individual is below $\frac{c}{\delta V}$ but he does not know this, he inappropriately perseveres in the project and G_F accounts for the gain of correcting his behavior at date 1. The second term (L_F) represents the loss from being informed, which may depress the individual's self-confidence: if he learns that θ is inside the procrastination zone, he will procrastinate at date 1 even though, *ex ante*, it was optimal to exert effort. Information is therefore detrimental to the extent that it creates a risk that the individual will fall into the time inconsistency region. If this *confidence maintenance motive* is strong enough ($L_F > G_F$), the individual will prefer to remain uninformed[5]. Therefore, overconfident people would be more frequently in this situation.

Notice that when the individual is underconfident, i.e. with beliefs below $\frac{c}{\beta\delta V}$ but true ability above, information is always valuable. Self-1 will always exert (weakly) less effort than Self-0 would have wanted to. Therefore, information can only help the individual to restore his deficient motivation.

$$I_F(underconfident) = \beta\delta\int_{\frac{c}{\beta\delta V}}^{1}(\delta V\theta - c)dF(\theta) > 0$$

[5] "In the absence of time inconsistency (β=1) we have $L_F > 0$ and thus $I_F \geq 0$: in classical decision theory, information is always valuable" (Bénabou and Tirole, 2002).

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The role of risk aversion

The qualitative characteristics of the model are maintained when analyzing separately individuals with different degrees of risk aversion: the time inconsistency creates a zone were the maintenance of personal motivation makes overconfident people prefer not to know their true ability when performing a task.

However, given the beliefs about θ for a given individual, we want to know how risk aversion affects the information acquisition decision.

To understand this more easily, I analytically solved the game above for a risk averse, risk neutral and risk loving individual whose ability (or probability of success when trying) $\theta \sim \mathrm{U}(0,1)$ have a uniform distribution. The payments associated to period 2 (given effort) differ over risk aversion as follow:

Risk averse	Risk neutral	Risk lover
$u_2 = \sqrt{\theta}V$	$u_2 = \theta V$	$u_2 = \theta^2 V$

Solving the problem, the new thresholds obtained for each degree of risk aversion are:

Self-0 point of view	Self-1 point of view
$\overline{\theta_0}(risk\ averse) \geq \left(\frac{c}{\delta V}\right)^2$	$\overline{\theta_1}(risk\ averse) \geq \left(\frac{c}{\beta\delta V}\right)^2$
$\overline{\theta_0}(risk\ neutral) \geq \frac{c}{\delta V}$	$\overline{\theta_1}(risk\ neutral) \geq \frac{c}{\beta\delta V}$
$\overline{\theta_0}(risk\ lover) \geq \sqrt{\frac{c}{\delta V}}$	$\overline{\theta_1}(risk\ lover) \geq \sqrt{\frac{c}{\beta\delta V}}$

As $0 < \frac{c}{\delta V} < 1$, the following order applies:

$$\overline{\theta_t}(risk\ averse) < \overline{\theta_t}(risk\ neutral) < \overline{\theta_t}(risk\ lover)\ \forall\ t = 0,1$$

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The intuition behind this is that risk loving agents have a marginal utility of commitment lower than risk neutral and risk averse individuals. Therefore, effort is only exerted for very high values of believed θ. On the other hand, more risk averse individuals are equally happy with much less utility, therefore they commit to effort for lower values of θ. Overall, risk loving individuals would decide to undertake the project less often than less averse agents for a given distribution of ability. Remember there is not disutility for not engaging in the project. Therefore the risky decision here is "not to do it".

The value of information across risk aversion

Solving the information acquisition decision problem analytically for the three different degrees of risk aversion, we found that information is more valuable, given confidence, for risk loving agents.

Risk averse		Risk neutral		Risk lover
$I_F = \frac{c^3}{(\beta\delta V)^2}\left(1-\frac{2}{3\beta}\right)$	$<$	$I_F = \frac{c^2}{\beta\delta V}\left(1-\frac{1}{2\beta}\right)$	$<$	$I_F = \frac{c^{3/2}}{(\beta\delta V)^{1/2}}\left(1-\frac{1}{3\beta}\right)$

Given the individual is exerting effort, i.e. his belief about his ability is above his respective threshold at date 1, a risk loving agent is more willing to learn if he is making an incorrect choice of undertaking the project. His gain from being informed (G_F) is thus much bigger than for risk neutral and averse individuals. Moreover, the loss from being informed (L_F), or the *confidence maintenance motive,* is higher for risk averse people, making the overall value of information even higher for risk lovers.

Summarizing, the model predicts that overconfident agents would more often prefer not to learn their true ability. Besides, given overconfidence, the value of information is declining in risk aversion: risk averse individuals would more often prefer not to know the truth.

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1.4. Experiment design

The sample consists of students from a standard taught course at undergraduate or postgraduate level. The structure of the course has to have (at least) one test accounting for X% of the final score and a (1-X)% final exam. The official information rule and common knowledge is that the result of the test(s) is not revealed until the final exam has been taken. The experimental setup is the following: immediately after the X% test, students are given the option to decide if they want to privately learn the score they got in X% test immediately before (minutes) the final exam (test (1-X)%). Given the student knows how much he studied and the difficulty of the X% test they just performed, I assume that the score is a good private signal proxy of his ability. According to the Bénabou and Tirole model, we would expect overconfident students to decide more often not to learn the result of the preceding test.

A general questionnaire will be applied to all the students of the class during the term. The most important measures to classify the students by their degree of overconfidence will be extracted here. Extra questionnaires measuring overconfidence are applied as robustness checks. Also, individual characteristics like age, gender and degree of risk aversion are collected.

In practice, to finally provide the feedback to the students according to their stated preferences was not possible because of Institutional rules. Immediately after the test corresponding to the X% of the final degree, the professors did communicate that the result of the test would not be revealed until the next test (or final exam). Therefore, the students had the option to decide in advance the information structure. Students were asked to answer a small questionnaire were they had to state whether or not they wanted to learn privately the result of the actual test immediately before the next test. With this information, and as the setting required, the professor would reveal the scores accordingly. The students would not have the option of learning the scores weeks in advance of the time of the next test, which prevented strategic behavior when deciding whether to learn their ability. Therefore, the decision only takes into account the theoretical channels exposed in section 1.3. In the next lecture, the professor apologized and communicated that the rules of the Institution with respect to the partial scores had to be applied (in

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general, students have the right to learn their scores weeks in advance the next test, for pedagogical reasons). Therefore, at the end the rules of the Institution were not modified, but the students stated their preference for knowing or not their *true ability* believing they had the option to decide, exactly the behavior I wanted to catch.

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1.5. Data

Data collection

The data collected in this experiment are (1) *true score (proxy for ability)*, (2) binary *observed final decision* about learning or not the true ability parameter, (3) independent measure of "calibration-based", "better than average" and "more accurate" overconfidence, (4) risk aversion and (5) general characteristics. The partial and final grades are also available and will be used to control for "general quality of the student" for robustness checks. Notice, however, the information is useless to analyze the effect of information on performance because effort is not observed.

I claim that the score students get in the tests is a proxy for *ability*. It is true that students will *contaminate* this measure of ability because they will study (or exert effort) to better perform. But they privately know if they studied or not and also the difficulty of the test already performed, therefore they would be able to privately extract a proxy of ability if they get information about the result.

The final decision is labeled 1 if the student decides to see the results of the previous tests immediately before the next test (or final exam) and 0 otherwise.

The General Questionnaire has three parts to measure (3), (4) and (5). The independent measure of calibrated-based overconfidence (CBO) and better-than-average (BTA) follows Deaves et al (2009). The measure more-accurate (MA) is ad-hoc. To get the CBO, general knowledge questions are provided where the student has to state, with 90% certainty, an interval for his answer. Overconfidence is then the proportion of questions for which the true answer falls outside the stated range. This method is known as *confidence-range judgments* in psychology and it is a better alternative than *two-choice questions judgments* that are said to be a fertile ground for bias information gathering (Klayman et al, 2000). CBO is exactly the kind of overconfidence measure we are interested in, because it compares the individual beliefs relative to himself. The measure of BTA is based on the answer to the question "Of the *N* (yourself included) students in this class, how many do you think will end up having a higher score than you in the test?" The measure of BTA

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corresponds to the deviation of the difference between the class' size *N* and the number the student gives, from the average size of the class. MA is 1 if the student answers YES to the question: "Do you think your answers to the *knowledge questionnaire* were more accurate than those of your classmates?" These last two overconfidence measures compare the individual with the rest of the class. It gives a *relative-to-others* measure of overconfidence that should not be relevant for the information acquisition decision analyzed here, because the tests in the sample are graded using absolute scale. If the scale were relative (to the average, to the best grade, etc.), BTA and MA instead of CBO should drive the information acquisition decision (see Appendix 1.1 for the general questionnaire applied).

The measure for risk aversion is constructed using the answer to the following question: "We would like to ask you a hypothetical question that you should answer as if the situation were a real one. You are offered the opportunity of acquiring an asset permitting you, with the same probability, either to gain half million Chilean pesos (1000 US$ approx.) or to lose all the capital invested. What is the most that you would be prepared to pay for this asset?" Following Guiso and Paella (2005), we are able to classify people among risk averse, risk neutral and risk lovers.

Finally, individual characteristics (age and gender) are also collected.

The measure of overconfidence is crucial for the identification in this empirical research. Attempting to avoid (or at least diminish) measurement problems, students were encouraged to honestly answer the questionnaires. The official lecturer of each class was the one explaining the rules and asking the students to do their best at answering the questionnaires, also communicating the intention of using the information being collected for academic research purposes. The high competitiveness of students in the sample (historically known in the Engineering Faculty as well as among students in Economics), it also should help in the direction of diminishing measurement problems: most of the students answered the questionnaires and the rate of explicit answers for all the questions was very high. As robust check to prevent measurement problems for overconfidence, a second questionnaire was applied to the classes under study.

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The Sample

The experiment was applied to 282 undergraduate students during the Spring term 2009 (September-December) in Santiago, Chile. Table 1.1 describes basic statistics (see appendix 1.2 for detailed statistics by gender). The courses **Chemistry**, **Economics** and **Statistics** are compulsory courses in the Engineering Faculty of the University of Chile. Chemistry corresponds to first year and Economics and Statistics to the fourth year. This explains the difference in average age. **Micro** and **Macro** are compulsory courses of the career Economics in Universidad Diego Portales, second and third year. The Engineering Faculty historically has had a majority of men, which is reflected in the higher proportion with respect to the other courses. The students over the whole sample are extremely risk averse: only 5 people of over 266 students that answered the risk aversion question reported to be risk neutral and there were no risk lovers. Around 45% of the sample reported to be willing to pay less than ten thousand Chilean pesos (equivalent to 2% of the lottery prize). Figure 1.3 shows kernel density estimation for the overall absolute risk aversion index.

Table 1.1: Sample summary statistics

Course		age (years)	gender (male=1)	absolute risk aversion (risk averse>0)	CBO (overconfident>0)	BTA (better than avg>0)	more accurate (yes=1)	know (want to know=1)
Chemistry	mean	18.8	0.81	0.36	0.39	0.04	0.20	0.46
	std.dev.	*1.04*	*0.40*	*0.07*	*0.24*	*0.21*	*0.40*	*0.50*
	N	59	58	55	55	55	55	57
Statistics	mean	22.0	0.71	0.32	0.53	0.08	0.30	0.49
	std.dev.	*1.02*	*0.46*	*0.11*	*0.23*	*0.20*	*0.46*	*0.50*
	N	65	65	62	65	64	64	65
Macro	mean	21.2	0.64	0.37	0.52	0.19	0.31	0.70
	std.dev.	*2.61*	*0.49*	*0.08*	*0.24*	*0.18*	*0.47*	*0.47*
	N	36	36	33	33	31	32	33
Micro	mean	19.3	0.53	0.39	0.38	0.07	0.23	0.74
	std.dev.	*1.12*	*0.50*	*0.04*	*0.25*	*0.33*	*0.43*	*0.44*
	N	43	43	37	37	31	31	43
Economics	mean	21.1	0.80	0.33	0.51	0.17	0.42	0.96
	std.dev.	*0.88*	*0.40*	*0.09*	*0.22*	*0.18*	*0.50*	*0.20*
	N	79	79	79	79	78	78	75
Total	mean	20.6	0.72	0.35	0.47	0.11	0.31	0.68
	std.dev.	*1.79*	*0.45*	*0.09*	*0.24*	*0.22*	*0.46*	*0.47*
	N	282	281	266	269	259	260	273

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The measures of overconfidence are positive across courses, in line with the international evidence. Overconfidence is measured for additional students (528 students in parallel classes of Chemistry, University of Chile; 22 PhD researchers in Economics, course in Econometrics, European University Institute). Figure 1.4 presents kernel densities for the CBO measures across courses. All of them are located towards positive values with similar variance. Table 1.2 shows a mean comparison across samples. It seems that the international evidence supporting high degrees of overconfidence is confirmed: the students in the sample sustain overestimated beliefs about their precision. It is also interesting to note the higher overconfidence levels among men compared to women in most of the samples.

Table 1.2: CBO International Comparison

Mean comparison	**CHILE**						**EUI**	Deaves et all (2009)	Klayman et al (1999)	Biais et al (2004)
Sample	Chemistry (528 students)	Statistics (65 students)	Macro (33 students)	Micro (37 students)	Economics (63 students)	Total Chile (726 studens)	Applied Econometrics (22 PhD students)	64 finance and economic students, Konstantz and McMaster Universitites.	32 students University of Chicago	245 stundets Toulose Unversity and London Business School
CBO	0.49	0.53	0.52	0.39	0.51	0.49	0.473	0.68	0.47	0.460
female	0.48	0.50	0.48	0.40	0.56	0.48	0.450	0.70		0.440
men	0.50	0.54	0.54	0.38	0.50	0.49	0.480	0.67		0.470

The measures BTA (better than average) and MA (more accurate) show positive average values, i.e. individuals have a tendency to think about themselves as better than their peers. The probability of believing the student answered the questionnaire more accurately than his classmates increases by 80% with BTA[6]. These two variables capture the same relative-to-others effect. If we compare CBO with BTA and MA, even though all of them show positive average overconfidence, we observe the coefficient of correlation between CBO and BTA is 0.08, i.e. almost no correlation! The theory behind this chapter does not make any prediction about how measures of confidence relative to your peers would affect your information acquisition decisions. As previously mentioned, the absolute grading system in the sample makes CBO the relevant measure of overconfidence for the information acquisition decision. Even though we have no prediction for the estimates

[6] This number was obtained estimating a *probit* model where the dependant binary variable is MA (=1 if more accurate) and the independent variables are BTA, gender, age and risk aversion. The marginal effect of BTA and gender are 0.8 and 0.3, respectively, both statistically significant different from zero at 1% confidence. The coefficients for age and risk aversion are not statistically significant different from zero.

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using BTA and MA, we do guess that the impact on the decision of getting information about your ability should be different when the grading scale is relative-to-others. Therefore, in the present study, the relevant effect to capture is the effect of CBO on the information acquisition decision; BTA and MA should have no effect.

Figure 1.3: Kernel Density, Absolute Risk Aversion.

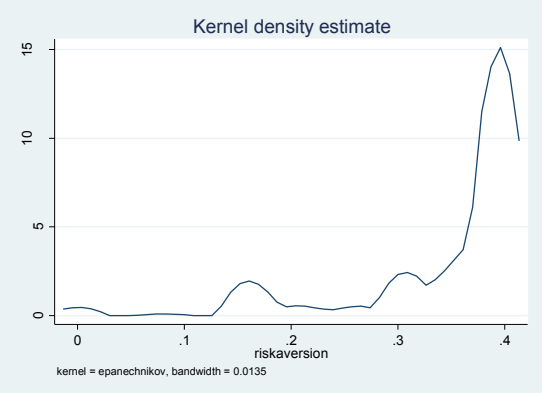
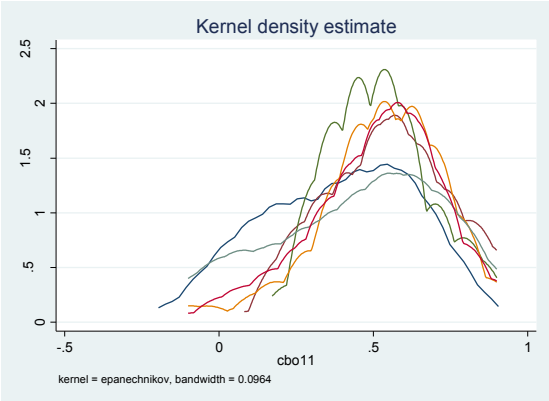


Figure 1.4: Kernel Density, Calibrated Based Overconfidence (CBO)



The variable “know” is 1 when the students answered affirmatively to learn the result of previous test before performing the next one. There is an important difference between the results from the first two courses in Table 1.1 (Chemistry and Statistics) and the last three (Micro, Macro and Economics). The last group has a very high proportion of students preferring to know compared to the first group (80% versus 47%, respectively). The reason is the following. The experiment in Chemistry and Statistics was applied in the second test out of three. After the third test, they had to perform a final exam. The students were told that the scores of test 2 would not be revealed until test 3 had been taken. Therefore, students that declared to prefer to know the results of test 2 immediately before sitting test 3 are the ones summarized here, corresponding to 46% and 49% of the classes. This is exactly the information acquisition decision the experiment attempts to capture. The experiments in Micro, Macro and Economics were applied to the second test out of two. After the second test, the students had to perform a final exam. The students were asked if they wanted to know the results of test 2 immediately before the final exam. However, the rules of the respective Institutions established that students with presentation-to-the-exam average score above a certain threshold would be exempt of sitting the exam. The

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questionnaire in Macro and Micro explicitly said that preferring to learn the results after the exam would also avoid knowing if the student was in the exempt category. Therefore, a bias towards "to know" is observed that would make spurious the estimation of the effect of overconfidence on information acquisition decision for this sample. In the case of Economics, the alternative given to the students was a bit different: they had to decide if learning the result of test 2 (a) after the final exam or (b) two weeks in advance the sitting date of the final exam. In this case the information about the score would also affect their allocation of effort (or time to study) for the final exam. We observe, accordingly, 96% of the students preferring to know. It is interesting to notice, in any case, that the 4% preferring *not to know* is far to the right on the distribution of overconfidence (CBO of the students varying across 0.6 and 0.9, where 0<CBO<1 means overconfidence).

Therefore, even though the data for *Micro, Macro & Economics* is still informative, caution has to be introduced when analyzing the results. The sample for *Chemistry & Statistics* is the most reliable and discussed in the next section.

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1.6. Results

The hypothesis tested and confirmed is: "overconfident students decide more frequently not to get the information about their true ability".

Table 1.3 summarizes the OLS (robust standard errors) estimation of the dependant variable *know* (=1 if students prefers to know) on overconfidence CBO, gender and additional characteristics.

Table 1.3: Information Acquisition OLS regressions (Overconfidence)

Dependant var.	**All Sample**				**Statistics & Chemestry**				**Micro, Macro & Economics**			
know=1	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
CBO	-0.151	-0.159	-0.158	-0.232	**-0.333**	**-0.346**	**-0.365**	**-0.366**	-0.071	-0.071	-0.072	-0.115
(Overconfidence)	(1.29)	(1.36)	(1.35)	(2.13)**	(1.80)*	(1.86)*	(1.96)*	(1.92)*	(0.58)	(0.57)	(0.59)	(0.95)
Gender	-0.1	-0.101	-0.118	-0.103	-0.212	-0.203	-0.236	-0.203	0.026	0.027	0.029	-0.023
(male=1)	(1.60)	(1.61)	(1.88)*	(1.71)*	(2.02)**	(1.88)*	(2.26)**	(1.91)*	(0.38)	(0.38)	(0.42)	(0.35)
Age		0.011				0.01				0		
		(0.75)				(0.40)				(0.03)		
Absolute Risk			-0.35				**-0.830**				0.058	
Aversion			(1.10)				(1.85)*				(0.13)	
Macro				0.196								
				(1.89)*								
Micro				0.198								0.032
				(1.96)*								(0.29)
Chemistry				-0.045				-0.054				
				(0.48)				(0.56)				
Economics				0.472								0.27
				(7.12)***								(2.95)***
Constant	0.825	0.604	0.965	0.688	0.797	0.6	1.118	0.83	0.864	0.872	0.842	0.767
	(11.94)***	(1.98)**	(7.09)***	(7.82)***	(6.94)***	(1.14)	(5.57)***	(6.59)***	(11.18)***	(3.09)***	(4.65)***	(7.56)***
Observations	254	254	251	254	116	116	113	116	138	138	138	138
R-squared	0.02	0.02	0.02	0.21	0.07	0.07	0.09	0.07	0	0	0	0.12

Robust t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

The first sets of estimations are performed over the whole sample. The estimated impact of overconfidence is negative as theory predicts. However, it only becomes statistically significance in the last specification, when fixed class effects are included. The latter makes sense because we control for the bias towards "prefer to know" as discussed in section 1.5 for the courses Micro, Macro and Economics. The positively bias effect is captured in the dummies for each class and, as it can be seen, it was indeed what was making spurious the estimated coefficient of CBO. Gender (equals 1 for male, 0 for female) has a negative statistically significant effect for the last two estimations for the whole sample: men are on average less willing to get feedback about ability. Separate regressions for the samples *Statistics & Chemistry* and *Micro, Macro & Economics* are then run.

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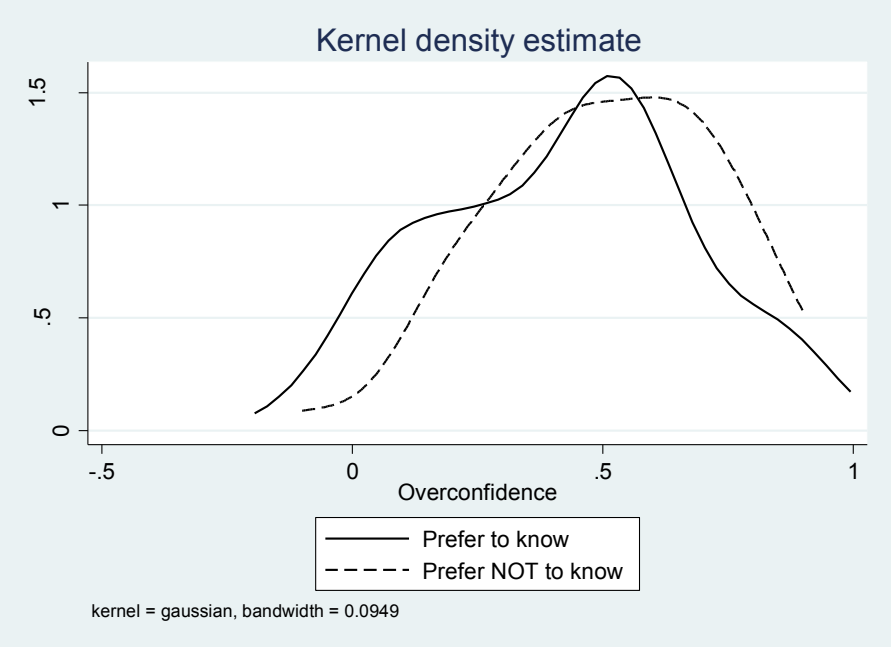
All the specifications for the sample of *Statistics & Chemistry* courses show the negative and statistically significant effect of overconfidence on the information acquisition decision. The estimated coefficient is robust to all the specifications. Gender (male=1) is again negative and statistically significant. The estimated coefficient for risk aversion, in line with the theory discussed in section 1.3, is also negative and statistically significant: the more risk averse the student, the less willing he is to learn his true ability.

It is also interesting to notice that the estimated overconfidence distribution function for people that preferred "not to know" seems to be more concentrated to the right compared to the distribution function for people preferring to know their true ability. The latter confirms the theory discussed in section 1.3. Kernel estimations for the sample of Statistics & Chemistry are shown in figure 1.5. The similarity with the theoretical distributions shown in figure 1.2 is revealing.

Figure 1.5: Kernel Density, Calibrated Based Overconfidence (CBO).



In the case of the estimations for *Micro, Macro & Economics*, even though the estimated coefficients for overconfidence are negative across specifications, they are not statistically different from zero, as anticipated. The confounding effect collected in the variable *know* for this sample, relative to the exemption from the final exam if the presentation score is

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higher than a threshold, makes spurious the interpretation of the estimated coefficient for the effect of overconfidence on the information acquisition decision. In other words, the score of the test is not only revealing the true ability to the student. It also reveals information about the possibility of passing the class and avoiding the final exam. Finally, the gender effect is not statistically different from zero for this sample.

Table 1.4 shows the equivalent regressions of table 1.3 but now controlling also for *ability* (the score they effectively got in the test they decided to know or not). The idea behind this is that ability should not be informative given that the students did not know the grade before taking the decision. However, for the last sample *Macro & Economics*[7], given the extra information contained in the score, we expect to capture the confounding effect to get a clean estimated coefficient for overconfidence[8]. As can be seen, the estimated coefficient for *ability* is indeed positive and statistically significant, capturing the anticipated biased trough *prefers to know*. The cleaner estimated coefficients for overconfidence are negative as theory predicts and, even though the t-statistics are higher than before, they do not become significantly different from zero.

Table 1.4: Information Acquisition OLS regressions, quality control (CBO)

Dependant var.	**All Sample**				**Statistics & Chemestry**				**Macro & Economics**			
know=1	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
CBO	-0.178	-0.192	-0.19	-0.277	**-0.304**	**-0.314**	**-0.344**	**-0.331**	-0.169	-0.166	-0.171	-0.164
(Overconfidence)	(1.36)	(1.47)	(1.45)	(2.32)**	(1.64)	(1.68)*	(1.84)*	(1.72)*	(1.25)	(1.22)	(1.25)	(1.28)
Gender	-0.163	-0.16	-0.19	-0.179	-0.21	-0.204	-0.235	-0.203	-0.081	-0.084	-0.079	-0.118
(male=1)	(2.44)**	(2.40)**	(2.83)***	(2.81)***	(2.03)**	(1.89)*	(2.26)**	(1.92)*	(1.47)	(1.48)	(1.35)	(1.76)*
Ability	0.002	0.006	0.006	-0.019	-0.056	-0.054	-0.044	-0.054	0.088	0.089	0.088	0.044
	(0.06)	(0.19)	(0.20)	(0.66)	(1.34)	(1.29)	(1.03)	(1.27)	(2.89)***	(2.87)***	(2.88)***	(1.48)
Age		0.023				0.007				0.005		
		(1.49)				(0.27)				(0.44)		
Absolute Risk			-0.506				-0.79				0.045	
Aversion			(1.57)				(1.75)*				(0.12)	
Macro				0.19								
				(1.80)*								
Chemistry				-0.041				(0.04)				
				(0.44)				(0.43)				
Economics				0.482								0.241
				(7.07)***								(2.56)**
Constant	0.874	0.389	1.056	0.85	1.037	0.897	1.297	1.054	0.63	0.515	0.613	0.684
	(5.65)***	(1.05)	(5.22)***	(5.65)***	(5.22)***	(1.53)	(4.96)***	(5.26)***	(3.75)***	(1.59)	(2.62)**	(4.33)***
Observations	219	219	216	219	116	116	113	116	103	103	103	103
R-squared	0.03	0.04	0.04	0.26	0.08	0.08	0.10	0.08	0.11	0.11	0.11	0.2

Robust t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

[7] The grades for the Micro class are not available for administrative reasons.

[8] Extra measures accounting for "quality of the student" were also used (*final degree* and presentation-*to-the-exam score*). The results are qualitative and quantitative similar to those discussed here using *ability*.

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Table 1.5: Information Acquisition OLS regressions (Better Than Average)

Dependant var.	All Sample				Statistics & Chemestry				Micro, Macro & Economics			
know=1	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
BTA	0.347	0.351	0.356	0.145	0.276	0.276	0.293	0.279	-0.05	-0.042	-0.05	-0.017
(better than averag	(2.41)**	(2.41)**	(2.47)**	(1.08)	(1.23)	(1.23)	(1.30)	(1.24)	(0.35)	(0.28)	(0.35)	(0.12)
Gender	-0.12	-0.121	-0.138	-0.12	-0.228	-0.228	-0.245	-0.229	0.045	0.04	0.048	-0.016
(male=1)	(1.88)*	(1.89)*	(2.15)**	(1.95)*	(2.20)**	(2.14)**	(2.34)**	(2.19)**	(0.63)	(0.53)	(0.64)	(0.24)
Age		0.015				0.001				0.006		
		(0.98)				(0.02)				(0.48)		
Absolute Risk			-0.357				-0.760				0.057	
Aversion			(1.06)				(1.72)*				(0.12)	
Macro				0.181								
				(1.68)*								
Micro				0.192								0.016
				(1.78)*								(0.13)
Chemistry				-0.01				0.008				
				(0.10)				(0.09)				
Economics				0.456								0.256
				(6.69)***								(2.65)***
Constant	0.729	0.427	0.866	0.573	0.643	0.632	0.917	0.64	0.83	0.709	0.808	0.718
	(13.54)***	(1.36)	(6.62)***	(7.65)***	(7.21)***	(1.21)	(5.41)***	(6.69)***	(13.38)***	(2.71)***	(4.58)***	(7.64)***
Observations	244	244	241	244	115	115	112	115	129	129	129	129
R-squared	0.03	0.04	0.04	0.20	0.05	0.05	0.07	0.05	0.00	0.00	0.00	0.12

Robust t statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 1.6: Information Acquisition OLS regressions (More than Accurate)

Dependant var.	All Sample				Statistics & Chemestry				Micro, Macro & Economics			
know=1	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
More accurate	0.062	0.058	0.057	-0.007	0.015	0.014	0.000	0.014	-0.009	-0.009	-0.008	-0.027
(equals 1 if yes)	(0.92)	(0.87)	(0.85)	(0.12)	(0.14)	(0.12)	(0.00)	(0.12)	(0.13)	(0.13)	(0.12)	(0.44)
Gender	-0.126	-0.126	-0.14	-0.114	-0.229	-0.228	-0.239	-0.228	0.034	0.031	0.037	-0.017
(male=1)	(1.91)*	(1.90)*	(2.10)**	(1.78)*	(2.11)**	(2.01)**	(2.17)**	(2.06)**	(0.47)	(0.42)	(0.49)	(0.25)
Age		0.011				0.002				0.004		
		(0.75)				(0.07)				(0.30)		
Absolute Risk			-0.341				-0.764				0.077	
Aversion			(1.05)				(1.76)*				(0.17)	
Macro				0.176								
				(1.67)*								
Micro				0.199								0.04
				(1.85)*								(0.34)
Chemistry				-0.019				-0.005				
				(0.20)				(0.05)				
Economics				0.469								0.285
				(6.94)***								(3.02)***
Constant	0.749	0.524	0.881	0.582	0.655	0.617	0.928	0.656	0.826	0.75	0.796	0.699
	(14.28)***	(1.71)*	(6.99)***	(7.76)***	(7.31)***	(1.15)	(5.53)***	(6.88)***	(13.34)***	(2.86)***	(4.58)***	(7.84)***
Observations	245	245	242	245	115	115	112	115	130	130	130	130
R-squared	0.01	0.02	0.02	0.20	0.04	0.04	0.06	0.04	0.00	0.00	0.00	0.13

Robust t statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Finally, tables 1.5 and 1.6 summarize the results for the estimations using the measures of "overconfidence" BTA and MA instead of CBO. The results confirm the problem of these two variables in properly capturing *absolute overconfidence (or with respect to the individual himself)*. The similarity in the estimations is remarkable (i.e. BTA and MA seem to capture the same kind of variation for the sample): gender (male=1) has a negative and statistically significant impact on the decision of learning the true ability except for the last sample (last four columns). The effect of BTA and MA is not statistically different from zero

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for almost all the specifications and samples. For the separate regressions on the sample *Statistics and Chemistry* the coefficients are also not statistically different from zero and gender and risk aversion impact negatively the information acquisition decision with 5% and 10% interval confidence, respectively.

If the decision about getting the information about true ability depends on things other than the believed value of self-esteem in the utility function, then the results could suffer from omitted variables. The experiment here isolates individuals from external motivation. There is no intervention of external agents *forcing* students to get the information (social pressure: "everybody did it"; dictator: father very authoritarian; peer effects: "all my friends did it"). If self-reputation matters in the decision making process, the signal you send about your ability to your future self will matter in today´s utility function. In this setting, true ability will be revealed sooner or later (i.e. the scores will be revealed at the end of the academic year in any case). Therefore, whatever the student type, self reputation should not be an issue when deciding whether to learn the true ability (it is just a matter of timing before the information is revealed). However, we cannot isolate individuals from external shocks that make them temporarily (or even permanently!) indifferent to everything, and therefore also to the decision of learning the true ability (the girlfriend just broke up with him; relative just had an accident, etc.). These shocks are expected to be random and captured in the error term.

To check possible measurement error in the levels of overconfidence and other measured variables, a second questionnaire was applied to the courses Chemistry, Macro and Micro (see appendix 1.3). Even though beliefs could exhibit some dynamic over time, an issue discussed in the second chapter of this thesis, the short time between the application of questionnaires should allow us to capture the same, or very similar, degree of overconfidence for the same individual. The correlation coefficients between the values obtained for CBO are indeed significant and positive (0.50 and 0.46) for Chemistry and Micro. Also the correlation between the values obtained for BTA are positive (0.54 and 0.46) and significant for the same courses. In the case of Macro, the results show no correlation to weaken the reliability of the measures for that specific sample.

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Information on overconfidence and other characteristics was also collected for 473 additional students, corresponding to five parallels Chemistry classes in the Engineering Faculty of the University of Chile, spring term 2009. Score records for most of these classes, in addition to the classes in the experiment, were also available. The scores students get in their respective classes are a mix of ability and effort, impossible to disentangle under this setting. Therefore, to look for the causal effect of overconfidence on performance would lead to spurious results. It is, in any case, interesting to note that there is no correlation between performance and overconfidence. The correlation coefficients between the CBO and the final score (the weighted sum of partial tests and final exam) for the 458 students in the final sample is statistically significant equal to 0.1. The correlation coefficients between the CBO and the presentation score (average of partial tests) is statistically significant and equal to 0.08.

Summarizing, the empirical results support the hypothesis that overconfident students decide more often not to learn their true ability. This evidence shows that information does not always seem to be valuable, as is assumed in classical decision theory.

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1.7. Conclusions

Behavioral economic theory for the problem of information acquisition decisions under uncertainty predicts that overconfident people with time inconsistent preferences would prefer more often not to get accurate information about their true ability, or the relevant uncertain fundamentals in their utility function. Based on the theoretical model of Bénabou and Tirole (2002), a field experiment in the area of education was designed and implemented to test this hypothesis.

The experiment was applied to 282 undergraduate students during the spring term 2009 in Santiago, Chile. The results confirm that the decision of learning the true ability depends negatively on the degree of overconfidence: the more overconfident the individual, the less frequently he prefers to know his true ability. The estimated distribution of overconfidence for individuals preferring not to know is to the right of individuals preferring to know, consistent with the theory discussed in section 1.3.

Information on overconfidence and other characteristics was also collected for 473 additional students, corresponding to five parallel chemistry classes in the Engineering Faculty of the University of Chile, Spring term 2009. Score records for most of these classes, in addition to the classes in the experiment, were also available. No correlation was found between final performance and overconfidence.

The main contribution of the chapter is the design and implementation of the field experiment. Notice that it is not properly a field experiment in the classical sense because the experimenter does not introduce external random variation in the setting. The beauty of the setting relies on the simplicity: with no intervention in the formal structure of the courses that participated in this experience, we are able to collect the relevant information to test the overconfidence hypothesis. The setting can be easily applied and even adapted to many other environments where personal control problem matters.

The heterogeneity in overconfidence of human beings matters for the information acquisition decision. Further research should be done to understand the effect of this heterogeneity on other important areas of economics where information matters for decision making.

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Appendix 1.1: General Questionnaire.

This information will be used only for research purposes and under total confidentiality (neither the professor nor the teacher assistant will have access to it).

Please try to answer as honestly as you can.

ID number (or name if you do not remember): _____

Age: _____ years

We would like to ask you a hypothetical question that you should answer as if the situation were a real one. You are offered the opportunity of acquiring an asset permitting you, with the same probability, either to gain 500 thousands Chilean pesos (approximately US$1000) or to lose all the capital invested. What is the most that you would be prepared to pay for this asset?

_____ Chilean pesos.

How many cigarettes do you smoke in a typical week, including the weekend?

_____ cigarettes.

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We would like to assess your general knowledge, and how well you know how much you know. For the following series of questions with clear-cut numerical answers, please provide 90% confidence intervals. Such an interval has a lower an upper bound such that you are 90% sure the correct answer lies in this interval. Note that if your intervals are too wide, the correct answer will fall in your interval more than 90% of the time, while, if you intervals are too narrow, the correct answer will fall in your intervals less than 90% of the time.

Question	Lower bound	Upper bound
World population growth between 1975 and 2005 (in percentage terms)		
Year in which Newton discovered universal gravitation		
Number of Nations in the OPEC (Organization of the Petroleum Exporting Countries)		
Number of overall medals that Greece won at the first Olympic Summer Games in 1896		
Year in which Bell patented the telephone		
Percentage of total area in world covered by water		
Height of Sears Tower in Chicago (in meters)		
Number of nations in NATO (North Atlantic Treaty Organization)		
Age of sun in billions (10^9) of years		
Number of bones in an average adult human skeleton		

Do you think that your answers were more accurate than your colleagues in the Questionnaire you just answered? (Answer YES or NOT)

_____

Of the 56 (yourself included) students in this class, how many do you think will end up having a higher score than you in test you just performed?

_____

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Appendix 1.2: Sample Summary Statistics by Gender.

Female

Course		age (years)	gender (male=1)	absolute risk aversion (risk averse>0)	CBO (overconfident>0)	BTA (better than avg>0)	more accurate (yes=1)	know (want to know=1)
Chemistry	mean	19.0	0.00	0.38	0.28	-0.06	0.00	0.55
	std.dev.	*0.77*	*0.00*	*0.02*	*0.30*	*0.20*	*0.00*	*0.52*
	N	11	11	10	10	10	10	11
Statistics	mean	22.3	0.00	0.34	0.50	0.10	0.05	0.68
	std.dev.	*1.33*	*0.00*	*0.11*	*0.29*	*0.15*	*0.23*	*0.48*
	N	19	19	16	19	19	19	19
Macro	mean	20.6	0.00	0.39	0.48	0.19	0.08	1.00
	std.dev.	*1.50*	*0.00*	*0.01*	*0.30*	*0.16*	*0.29*	*0.00*
	N	13	13	12	12	12	12	10
Micro	mean	19.5	0.00	0.40	0.27	0.02	0.07	0.65
	std.dev.	*1.05*	*0.00*	*0.01*	*0.25*	*0.28*	*0.26*	*0.49*
	N	20	20	17	17	15	15	20
Economics	mean	20.8	0.00	0.36	0.56	0.09	0.13	0.94
	std.dev.	*0.40*	*0.00*	*0.06*	*0.20*	*0.20*	*0.34*	*0.25*
	N	16	16	16	16	16	16	16
Total	mean	20.5	0.00	0.37	0.43	0.07	0.07	0.75
	std.dev.	*1.58*	*0.00*	*0.06*	*0.29*	*0.21*	*0.26*	*0.44*
	N	79	79	71	74	72	72	76

Men

Course		age (years)	gender (male=1)	absolute risk aversion (risk averse>0)	CBO (overconfident>0)	BTA (better than avg>0)	more accurate (yes=1)	know (want to know=1)
Chemistry	mean	18.8	1.00	0.36	0.41	0.06	0.24	0.44
	std.dev.	*1.11*	*0.00*	*0.08*	*0.22*	*0.21*	*0.43*	*0.50*
	N	47	47	45	45	45	45	43
Statistics	mean	21.9	1.00	0.32	0.54	0.07	0.40	0.41
	std.dev.	*0.86*	*0.00*	*0.11*	*0.20*	*0.22*	*0.50*	*0.50*
	N	46	46	46	46	45	45	46
Macro	mean	21.6	1.00	0.36	0.54	0.20	0.45	0.55
	std.dev.	*3.04*	*0.00*	*0.09*	*0.20*	*0.20*	*0.51*	*0.51*
	N	23	23	21	21	19	20	22
Micro	mean	19.2	1.00	0.38	0.48	0.11	0.38	0.81
	std.dev.	*1.19*	*0.00*	*0.06*	*0.21*	*0.38*	*0.50*	*0.40*
	N	23	23	20	20	16	16	21
Economics	mean	21.1	1.00	0.32	0.50	0.19	0.50	0.97
	std.dev.	*0.96*	*0.00*	*0.09*	*0.22*	*0.17*	*0.50*	*0.18*
	N	63	63	63	63	62	62	58
Total	mean	20.6	1.00	0.34	0.49	0.12	0.40	0.65
	std.dev.	*1.87*	*0.00*	*0.09*	*0.22*	*0.22*	*0.49*	*0.48*
	N	202	202	195	195	187	188	190

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Appendix 1.3: Extra-Questionnaire (measurement validation).

This information will be used only for research purposes and under total confidentiality (neither the professor nor the teacher assistant will have access to it).

Please try to answer as honestly as you can.

ID number (or name if you do not remember):_____

Age: _____ years

We would like to assess your general knowledge, and how well you know how much you know. For the following series of questions with clear-cut numerical answers, please provide 90% confidence intervals. Such an interval has a lower an upper bound such that you are 90% sure the correct answer lies in this interval. Note that if your intervals are too wide, the correct answer will fall in your interval more than 90% of the time, while, if you intervals are too narrow, the correct answer will fall in your intervals less than 90% of the time.

Question	Lower bound	Upper bound
GDP per capita in Malaysia in 2005 (in US dollar 2004)		
Number of countries in the United Nations		
Year in which Mozart wrote his first symphony		
Gestation (conception to birth) period of an Asian elephant (in days)		
Elevation (in meters above sea level) of Mt. Everest		
Number of babies born in world in 2007 (per 1000 people)		
World –wide life expectancy at birth in 2000-05 (years)		
Land area in the world (in millions of square kilometers)		
Greatest depth (in meters) of the Pacific Ocean		
Number of calories in 100gr. potato		

Do you think that your answers were more accurate than your colleagues in the Questionnaire you just answered? (Answer YES or NOT)

_____

Of the 56 (yourself included) students in this class, how many do you think will end up having a higher score than you in the test you just performed?

_____

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Chapter 2: The Dynamic of Beliefs, Introduction of the Euro

2.1. Introduction

The main purpose of this chapter is to answer what explains the observed dynamic of beliefs when individuals face *exogenous* big events. Looking at data from Eurobarometer and focusing on the beliefs about the possible benefits related to the introduction of the single currency in the Euro Zone (1999 and 2002), a striking feature is observed: the aggregate support for the Euro increases before the adoption and declines right after, slowly reverting to the norm. This chapter aims to find an explanation of this dynamic, trying to disentangle the main forces behind it.

The single currency was introduced in non-physical form (traveler's checks, electronic transfers, banking, etc.) at midnight on 1st January 1999, when the national currencies of participating countries (the Euro zone) ceased to exist independently, given that their exchange rates were locked at fixed rates against each other, effectively making them mere subdivisions of the Euro. The notes and coins for the old currencies, however, continued to be used as legal tender until new notes and coins were introduced on 1st January 2002.

Figure 2.1 shows the aggregate dynamic of beliefs for the European Union (EU) where a gradual improvement (or decline in the share of population against the Euro) and the posterior boosting are observed in both the relevant dates, the beginnings of 1999 and 2002. This pattern replicates in most of the countries of the EU, with more or less intensity consistent to the final adoption of the single currency (see appendix 2.1). In the example here[9], the support during the implementation dates increases by around 10 percentage

[9] The countries considered in this study are all the states adopting the Euro between 1999 and 2002 (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal,

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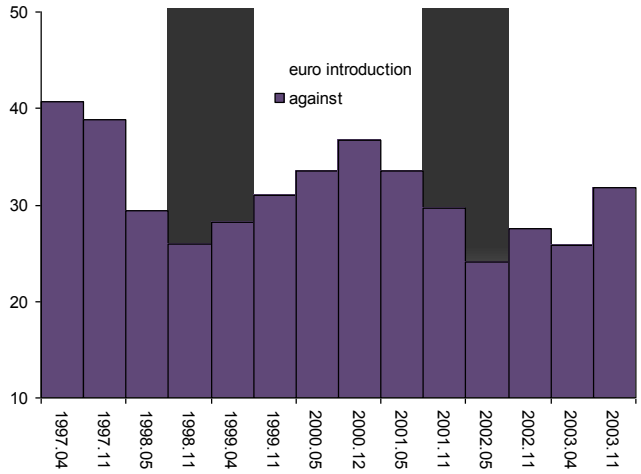
points with respect to the year before, equivalent to 30 million people becoming more optimistic with respect to the benefits of the Euro.

Figure 2.1: Percentage of population against the introduction of the Euro, EU.



Source: Eurobarometer.

To understand the dynamic of beliefs is important to realize that beliefs not only trigger actions at an individual level, as discussed in the first chapter of this thesis, but also at the collective level. In the case of individual actions, for example, if the relevant individuals are consumers, their beliefs about certain available or promised goods would determine how much they spend. At the collective level, governments or societies try to implement policies that directly and strongly affect the population. The final implementation is not sustainable if the citizens do not believe in the future benefit of the policy and fail to support it. Therefore, there exists *room* for sellers (politicians) to influence the beliefs of consumers (citizens) to obtain the profits of selling the product (being elected).

Glaeser (2004) discusses a theoretical model to explain why individuals would sustain false beliefs even in the presence of accurate information. Inspired in this discussion, the economic model used to understand the dynamic of beliefs requires a demand side (consumers or citizens who form beliefs that trigger actions) and a supply side (actors who

Spain), plus Denmark, Sweden and United Kingdom, countries within the European Union that did not adopt the Euro.

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could benefit from consumers' decisions). The key characteristic required by this model is that individuals are subjected to influence by the interested actors and individuals update their beliefs with the arrival of new information sets. Boosting beliefs in the presence of *big events* under this framework is the result of the interaction between (a) individuals that have preferences for self-serving beliefs (they get direct benefits from believing and convincing others) and that face imperfect recall (constraints to remember the past and/or to correct errors), and (b) actors such that friends, politicians and media that obtain net benefits from manipulating individuals beliefs and when the *big event* or policy is already in place, revert back to the norm (given the cost of manipulation). Therefore, all the optimism (or *false beliefs*, under the Glaeser framework) can suddenly jump down when the information set is updated and the influences are gone.

Specifically, I look at the dynamics of people's beliefs relative to the introduction of the single currency in Europe, using the data sets of Eurobarometer. The Standard Eurobarometer surveys are conducted on behalf of the European Commission at least twice a year in all member states of the European Union. Since the early seventies they have provided regular information on social and political attitudes of the European public. Each Eurobarometer consists of personal interviews to approximately 1000 individuals per country and provides representative weighting factors to properly compare countries over time.

The results confirm the theoretical intuition with respect to the influence of variables related to supply and demand side of belief formation, under the identification assumption about the exogeneity of these variables. The demand side of the formation of beliefs shows that: to sustain political discussion, persuade friends, to have optimistic expectations for the next year, to be pro-European and to be satisfied with your life are associated with a decrease in the probability of being against the Euro. In the case of the supply side of formation of beliefs, we observe the following: to have knowledge about European institutions, to frequently access media (TV, radio and newspapers) and to trust national and European institutions are associated with a decrease in the probability of being against the single currency.

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The main result supports the existence of a boosting in beliefs during both the dates of the introduction of the Euro. After the non-physical introduction in 1999, the probability of being against the Euro increases by 10 percentage points. There is no evidence, however, of a 'post' improvement in people's beliefs, consistent with the slow citizens' realization of the application of the policy. In the case of the 2002 introduction of the single currency, the probability of being against the Euro decreased by 8 percentage points in the neighborhood of the implementation date and increased by 2-5 percentage points right after it.

There is empirical evidence of the enforced role of self-serving beliefs during the implementation dates with respect to the period immediately before, reflected in the higher impact on the probability of being against the Euro of variables like optimistic expectations for the next year, higher degrees of life satisfaction and active political discussion. The most relevant effect after the physical introduction of the Euro in 2002 is the reduction of the relevance, in decreasing the probability of being against the Euro, of *knowing about European institutions*, consistent with the hypothesis of less information being supplied by European and national institutions once the policy is in place. It is also interesting the increased relevance of trusting European Central Bank and European Parliament in reducing the probability of being against the Euro after the introduction in 2002. This could explain why beliefs after the introduction of the Euro were not as pessimistic as before. The role of European institutions as a new source of Euro credibility, especially after the physical introduction, could be driving this result.

It is important to notice that the main weakness of this chapter relies on the exogeneity assumption that makes the identification possible. I argue against the endogeneity problem of variables included as supply and demand forces of belief formation when presenting the data. However, the necessary precaution interpreting the causal effect of the results is recommended.

This chapter is organized as follows. Section 2.2 discusses the theoretical framework relevant to explain the dynamic of beliefs. Section 2.3 describes the empirical strategy, showing the data and the econometric setting. Section 2.4 presents the main results. Section 2.5 concludes.

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2.2. Literature review

The process of belief formation is the key element of this study. I am interested in empirically analyzing its evolution in the presence of exogenous events. The literature described in this section could be divided in three parts. Firstly, different beliefs imply different aggregate equilibria and this is empirically shown by Bénabou and Tirole (2006). Second, that in the presence of exogenous events individuals beliefs change. Di Tella et al (2007) explores a natural experiment in Argentina, providing support for the hypothesis of change in individual beliefs after facing exogenous event. Third, a framework to understand belief formation and evolution is needed. This will be based on the discussion for the ingredients for a model of false beliefs of Glaser (2004).

Bénabou and Tirole (2006) develops a theoretical framework to explain why most of the people need to believe in a just world (*you get what you deserve, effort pays*, etc.). It is argued that differences in the valuation of these beliefs across countries and their prevalence could explain important international divergences in aggregate macroeconomic variables. The theoretical model analyzed refers to an optimal tax level to be decided by a community based on general beliefs. Divergent measures of beliefs can then explain governments with different degrees of power. The authors explain several macro differences between Europe and US, in line with belief divergences.

Di Tella, Galiani and Schargrosky (2007) provides empirical evidence of changes in beliefs and discusses the possible mechanisms. The paper studies the formation of beliefs exploiting a rare natural experiment in Argentina, where some households of a very homogeneous community obtained property rights on the land they lived, the selection being mainly exogenous. A significant difference is found in the beliefs held by squatters with and without legal titles. This empirical finding is connected to my research supporting the idea that “big events” (or strong shocks, such as the giving of property rights) can have an effect on beliefs. The main advantage of Di Tella, Galiani and Schargrosky (2007) is the presence of exogenous variation across squatters to measure the effective change in beliefs.

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Gleaser (2004) discusses an economic model of false beliefs and their implications. Even though the paper attempts to explain the maintenance over time of determined "false" beliefs, the theoretical framework is useful for understanding the mechanisms behind the dynamic of beliefs analyzed in this chapter.

The economic model used to understand the dynamic of beliefs requires a demand side (consumers or citizens who form beliefs that trigger actions) and a supply side (actors who could benefit from consumers or citizens' decisions). The key characteristic of the model is that consumers are subject to influence by the interested actors. Individuals also update their beliefs with the arrival of new information sets. Boosting beliefs in the presence of *big events* under this framework is the result of the interaction between (a) individuals that have preferences for self-serving beliefs (they get direct benefits from being optimistic today, from convincing others to believe what they do and from overvaluing the goodness of the past) and that they face imperfect recall (constraints to remember the past and/or to correct errors) and (b) actors such that friends, politicians and media that obtain net benefits from manipulating individuals beliefs and, when the *big event* or policy is already in place, revert back to the norm (given the cost of manipulation). Therefore, optimism levels suddenly jumps down when the information set is updated and external influences are gone.

This is a novel way of looking at the importance of beliefs for aggregate results and the linkage to my research is strong in the sense that the introduction of the Euro could have not been sustained without the citizens' support[10]. In what follows I will refer to the literature relevant for both sides of the formation of beliefs.

Demand side or "Motivated beliefs": the individuals

Experiments performed in sociology and political science[11] shows that individuals tend to sustained false consciousness even though they get periodical information that show them

[10] For example, the introduction of the European Union Constitution broke down mainly because of the opposition of the citizens in France and Sweden despite the initial agreement of the authorities in each country.

[11] Bénabou and Tirole (2006) discusses this issue in detail.

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how wrong they are. The question is why. The beliefs under this paradigm are chosen and valued by the individuals. Most of the existing literature about beliefs in my opinion relies on this. Bénabou and Tirole (2001) takes a pioneering approach at exploring the mechanisms for the formation of beliefs. In trying to put together many observational findings in psychology and looking at their main economic implications, an analytical framework is developed in order to better explain individual behavior. The paper is able to give formal content to individuals *traits* (such that self-confidence, intrinsic motivation, dependence or autonomy and power of will) as well as to cognitive processes (such as wishful thinking or selective memory, self-monitoring and the setting of personal rules) and departs from the typical ultra-rational economic agent allowing for imperfect self-knowledge, imperfect willpower and imperfect recall.

Individuals could demand a certain type of beliefs for several reasons. Bénabou and Tirole (2002) opens a new perspective when looking at dynamic games where the players are the agent in the present and the same agent in the future. Self-signaling becomes relevant in the sense that what I believe today (about myself or about more general issues) could affect either my actions or beliefs in the future, and vice versa (reputation matters). It is here that the literature pays strong attention to explaining human behavior, i.e. modeling how the beliefs individuals sustain about themselves can affect their behavior. The latter is not attempting to explain the result of specific collective choices; however how the authors analyze the formation of beliefs in this literature becomes a relevant tool for my research. Under this idea, thinking about the introduction of the Euro, people do not want to believe the implementation of this policy is going to be terrible for them. Individuals assign more than realistic advantages to the effects of this specific policy, valuing at the present this overillusion. This is one branch of the demand side of self serving beliefs formation and when individuals perceive the implementation of the policy and actually realize the true effects, the consequent disillusion should be reflected in less optimistic beliefs. Self-serving beliefs are also related in the literature to the recognition of imperfect recall and the tendency of individuals to better recall good past experiences over bad ones. In the case analyzed in this chapter, self-serving beliefs from imperfect recall would refer to how important collective experiences introducing policies in the European Union could be inputs for the formation of beliefs of successive policies.

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Another important branch of self-serving beliefs refers to social signaling. On the one hand, people get benefit either by making other people to believe what they do, and also from what other people think about them (*I like when other people like how I am or how I behave*). On the other hand, Battaglini, Bénabou and Tirole (2005) looks at the effect of peer groups and its influence on individuals' behavior. The idea is that individuals benefit by believing the same as peers they admire, trust or associate as being nearer to themselves.

Supply side of formation of beliefs: the interested actors

The information available is an important input for the beliefs formation process. Moreover, if agents rationally update their beliefs, the observed boosting could have been the consequence of sudden jumps in the availability of information during the period. Therefore, given individuals hold Bayesian mechanisms to update their beliefs, they updated their priors accordingly. Also, the information available could have been manipulated by interested media actors. For example, sensationalist newspapers or TV programs could get direct benefits manipulating information (higher profits for higher contingent sales, more announcers, etc.).

Indoctrination has been another mechanism widely discussed in the literature. It refers to how the influence of your parents and/or any other kind of authority could shape your beliefs about yourself and then, about your actions. Bénabou and Tirole (2003) introduces the idea of external and internal motivation when people perform certain tasks. The paper models a game where an agent with imperfect self-knowledge has to choose the level of effort to exert and an informed principal (for example, a parent) who chooses an incentive structure for the agent. Therefore, what the principal believes about the agent becomes relevant for the decision making process of the agent and indeed, the principal could manipulate the information given to the agent to get the effort that maximizes the principal's utility. This mechanism could have been relevant for the boosting in beliefs here analyzed. When politicians have a target to be achieved, say the effective introduction of the Euro, they could manipulate the beliefs of citizens for their interests. However, once the target is reached they revert back to the norm, as do people's beliefs.

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Friends, workmates or relatives can also be relevant influences for the agent's formation of beliefs, in the sense that they are also agents that benefit by convincing others (in this case, the individual forming beliefs) about their own beliefs.

Given the data set available, the main purpose of this chapter is to test the relevance of the channels, discussed above, for boosting beliefs related to the introduction the single currency in the Europe. The observed aggregated boosting (by country and for the Euro Zone as a whole) is the starting point here. The challenge is to test the dynamics of individual beliefs and the main channels for beliefs' formation.

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2.3. Empirical Strategy

The main purpose of the empirical part of this chapter is to test the existence of a boosting in individuals' beliefs when individuals face an exogenous big event. As mentioned in the section 2.2, individuals form beliefs influenced by demand (intrinsic motivation) and supply (interested actors) forces. This section presents the data and the econometric setting of the study.

The data

Monitoring public opinion in the European Union is the mission of the Standard Eurobarometer surveys conducted on behalf of the European Commission, at least two times a year in all member states of the European Union. Since the early Seventies, they have provided regular information on social and political attitudes of the European public. Since the Nineties the Eurobarometer program has been complemented by the small scale Flash Eurobarometer on specific affairs and by the Central and Eastern Eurobarometer series (at a later date replaced by the Candidate Countries Eurobarometer).

The Standard Eurobarometer survey series is a unique program of cross-national and cross-temporal comparative social research. Since the early Seventies, representative national samples in all of the European Union, formerly European Community, member states have been simultaneously interviewed in each Spring and Autumn. The Eurobarometer series is designed to provide regular monitoring of the social and political attitudes of the European Union public through specific trend questions. The data received from the principal investigator is checked, corrected and formatted to archival standards, since the beginning of the series, by the Inter-university Consortium for Political and Social Research (ICPSR), recently in cooperation with the Zentralarchiv (ZA) and intermittently with the Swedish Social Science Data Service (SSD). The data is comprehensively documented in machine readable codebooks in English, including the unweighted, absolute and relative frequency counts for each country.

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I organize the data available focusing on the two relevant dates for the event *Introduction of the Euro*: the non-physical form of the single currency (traveler's checks, electronic transfers, banking, etc.) at midnight on 1st January 1999 and the replacement of the domestic notes and coins on 1st January 2002.

After the inspection of the available data, the selection of variables explaining beliefs relative to the introduction of the Euro is summarized in table 2.1, where the original survey question and the name and label of the variable are shown[12]. The variables selected to be on the demand side of the formation of beliefs are the ones related to expectation for the next year (*explife, expeco, expfin, expunemp, expjob*), life satisfaction (*satis*), European identification (*identity*), how proud you feel of your nationality (*pride*), degree of political discussion (*poldis*) and persuading friends (*persuade*) when talking about political issues. As mentioned in section 2.2, the demand side of the formation of beliefs refers to the individual personal motivation to believe in something. If individuals are optimistic today they would tend to be optimistic also about other issues, as the introduction of the Euro. This effect can be caught by the variable life satisfaction. Another important channel of self-serving beliefs is that related to self-signaling. People need to give good signals to future realizations of themselves. Therefore, if they are optimistic with respect to the future on several topics, this should also be reflected in beliefs about the Euro and the variables related to expectations for the next year attempt to catch this effect. If the individual gets direct utility from feeling European and consequently, believing that the Euro introduction would help in that direction, the variable related to *identity* would reflect that. On the other hand, if they see the introduction of the Euro as a threat for their nationalism, the variable *pride* would have an opposite effect. Under the same logic, if individuals benefit in some sense from holding political discussions and convincing friends about political issues, this positive effect on the probability of supporting the introduction of the Euro would be captured by the variables *poldis* and *persuade*. It should be noted that no variables reflecting imperfect recall were found given the data available.

[12] See appendix 2.2 for a graphical aggregate evolution of these variables over time.

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Table 2.1: The relevant variables

Question	*Name of the variable* (label values)
Dependent variable identifying beliefs	
Is the respondent 'for' or 'against' a common European currency (single currency) replacing the national currencies in all EC / EU member states?	*euro* (1 against; 0 in favour)
Explanatory variables: Demand side of the formation of beliefs	
Expectations: What are your expectations for the next 12 months to come? Will be better, worse or the same, when it comes to (a) your life in general, (b) the economic situation of your country, (c) the financial situation of your household, (d) the employment situation in your country, and (e) your personal job situation.	*explife, expeco, expfin, expunemp, expjob* (1 "better", 2 "worse", 3 "same")
Life satisfaction: On the whole, are you satisfied, fairly satisfied, not very satisfied or not at all satisfied with the life you lead?	*satis* (1 "very", 2 "fairly", 3 "not very" 4 "not at all")
In the near future, do you see yourself as (a) national (b) national and European (c) European and national (d) European only	*identity* (1 "national", 2 "national+ european", 3 "european+ national" 4 "european")
Would you say you are very proud, quite proud, not very proud, not at all proud, to be "nationality"?	*Pride* (1 "very", 2 "quite", 3 "not very" 4 "not at all")
Political discussion: When you get together with friends, would you say you discuss political matters frequently, occasionally or never?	*Poldis* (1 "frequently", 2 "occasionally", 3 "never")
Persuade friends: When you hold strong opinion, do you ever find yourself persuading your friends, relatives or fellow workers to share your views? If so, does it happen often, time to time, rarely or never?	*persuade* (1 "often", 2 "from time to time", 3 "rarely" 4 "never")
Explanatory variables: Supply side of formation of beliefs	
How much do you feel you know about the European Union, its policies, its institutions?	*Knowledge* (scale for 1 "knowing nothing" to 11 "knowing a great deal")
About how often do you (a) watch news on TV (b) read about current politics in daily newspapers (c) listen to the broadcasts on the radio? Every day, several times a week, once or twice a week, less often or never.	*newstv, newspaper, newsradio* (1 "everyday", 2 "several times a week", 3 "once or twice", 4 "less often", 5 "never")
Trust: Do you tend to trust or tend not to trust (a) the press (b) the radio (c) television, and (d) political parties.	*trustpress, trusttv, trustradio, trustpol* (1 "tend to trust", 2 "tend not to trust", 3 "do not know")
Trust institutions: Do you tend to trust or tend not to trust (a) European Commission, (b) European Parliament, (c) European Central Bank	*trustec, trustep, trustecb* (1 "tend to trust", 2 "tend not to trust", 3 "do not know")

The supply side of the formation of beliefs refers to interested actors that influence the beliefs of individuals. The relevant variables identified here are related mainly to the interaction between the individual and the information he gets. The variable *knowledge* measures how much they know about the European Institutions (one of them, for example, the Euro), and the effects of knowing more should be consistent with supporting the single currency. It is assumed that the information related to the Euro comes from interested actors (European institutions, national governments, etc.) and, consequently, the more pro-Euro the information, the more the individuals' knowledge. Under the same logic and by assuming interested actors also use the media to communicate their pro-Euro information, the frequency with which individuals access news in general is caught by

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newstv, *newspaper* and *newsradio*. How much they trust the media is reflected in *trustpress*, *trusttv*, *trustradio*. Looking at the influence of political actors and European institutions, the variables under interest are *trustpol*, *trustec*, *trustep* and *trustecb*.

The crucial assumption that will make identification possible is the exogeneity of all variables in supply and demand sides of the formation of beliefs. In the case of demand side of the formation of beliefs variables, the assumption could be problematic for the variables related to *expectation for the next year*. As mentioned before, these variables attempt to catch the signaling effect to future realizations of the individual and it is difficult to argue against some correlation. The same happens in the case of the variables related to *trust* in the supply side of formation of beliefs, where trusting individuals could indeed be biased to trust institutions as a whole also. Therefore, precaution has to underlie the interpretation of results in the specifications that include these variables.

Table 2.2: Summary of variables and availability over time.

Name of variable	1997.4	1997.11	1998.5	1998.11	1999.4	1999.11	2000.5	2000.12	2001.5	2001.11	2002.5	2002.11	2003.4	2003.11
Demand side of formation of beliefs														
explife		x		x		x		x	x	x	x	x		x
expeco		x		x		x		x		x		x		x
expfin		x		x		x		x		x		x		x
expunemp		x		x		x		x		x		x		x
expjob		x		x		x		x		x		x		x
satis	x		x			x	x	x	x	x	x	x		x
identity	x		x	x		x	x	x		x	x	x	x	x
pride	x					x	x	x		x	x			x
poldis	x	x	x	x	x	x	x	x	x	x	x	x	x	x
persuade	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Supply side of formation of beliefs														
knowledge		x	x	x	x	x	x	x	x	x	x	x	x	x
newstv	x	x	x	x	x	x	x	x	x	x				
newspaper	x	x	x	x	x	x	x	x	x	x				
newsradio	x	x	x	x	x	x	x	x	x	x				
trstpress		x			x			x	x	x	x		x	x
trustradio		x			x			x	x	x	x		x	x
trsuttv		x			x			x	x	x	x		x	x
trsutpol		x			x			x	x	x	x		x	x
trustep					x	x	x	x	x	x	x	x	x	x
trsutec					x	x	x	x	x	x	x	x	x	x
trustecb					x	x	x	x	x	x	x	x	x	x

The period under study covers the years 1997 to 2003. The harmonization of a data set including the trend over time of the relevant variables was rigorously done and details are shown in appendix 2.3. Table 2.2 shows the summary of variables and the availability over time. As it can be seen, there is a tradeoff between the number of observations (i.e.

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number of surveys where the variables are available) and the number of covariates. The specifications discussed later take into account the time/variable availability.

The set of individual characteristics, available for the whole period under study, corresponds to gender, age, education, marital status, if the individual is head of the household and country of residence. Summary statistics for the whole sample are shown in Table 2.3 (see appendix 2.4 for statistics by country).

Table 2.3: Summary statistics, European Union (Eurobarometer)**.**

date		education (age when finishing studies) excludes people still studying	age (years)	gender (1 male, 2 female)	head of household (1 yes, 2 no)
1997.04	mean	17.66	43.74	1.52	1.52
	std.dev.	*4.62*	*17.81*	*0.50*	*0.50*
1997.11	mean	17.59	43.75	1.52	1.52
	std.dev.	*4.62*	*17.96*	*0.50*	*0.50*
1998.05	mean	17.64	43.84	1.52	1.52
	std.dev.	*4.57*	*17.91*	*0.50*	*0.50*
1998.11	mean	17.67	44.67	1.52	1.52
	std.dev.	*4.77*	*18.31*	*0.50*	*0.50*
1999.04	mean	17.61	44.70	1.52	1.52
	std.dev.	*4.59*	*18.31*	*0.50*	*0.50*
1999.11	mean	17.62	44.65	1.52	1.52
	std.dev.	*4.60*	*18.30*	*0.50*	*0.50*
2000.05	mean	17.69	44.68	1.52	1.52
	std.dev.	*4.64*	*18.26*	*0.50*	*0.50*
2000.12	mean	17.82	44.82	1.52	1.52
	std.dev.	*4.76*	*18.34*	*0.50*	*0.50*
2001.05	mean	17.77	44.73	1.52	1.52
	std.dev.	*4.62*	*18.28*	*0.50*	*0.50*
2001.11	mean	17.92	44.70	1.52	1.52
	std.dev.	*4.66*	*18.22*	*0.50*	*0.50*
2002.05	mean	17.87	44.78	1.52	1.52
	std.dev.	*4.64*	*18.37*	*0.50*	*0.50*
2002.11	mean	17.77	44.69	1.52	1.52
	std.dev.	*4.37*	*18.29*	*0.50*	*0.50*
2003.04	mean	17.97	45.30	1.52	1.52
	std.dev.	*4.81*	*18.43*	*0.50*	*0.50*
2003.11	mean	17.99	45.26	1.52	1.52
	std.dev.	*4.73*	*18.35*	*0.50*	*0.50*
Total		**17.76**	**44.60**	**1.52**	**1.52**
		4.65	***18.23***	***0.50***	***0.50***

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Econometric setting

The available data are cross-sectional sets of individuals. In a first step, and given the richness of the data, a test is performed for a non linear model with a binary dependent variable representing beliefs in the relevant period of time t. Here, the boosting in beliefs is not being tested, the data is merely being examined, by relevant period, in order to understand the within relevance of "demand" and "supply" forces behind the formation of beliefs concerning the benefits of the introduction of Euro. This is summarized by Equation (1):

$$E(y / X_d, X_s, X, t) = \Psi(\beta_0 + \beta_d X_d + \beta_s X_s + \beta X | t) \qquad (1)$$

$E(\cdot)$ refers to the conditional expectation of y (a binary variable vector defining beliefs for individual *i=1 to N* in period *t*). The *big events* for the introduction of the Euro in this research are two: the non-physical form of the single currency (traveler's checks, electronic transfers, banking, etc.) at midnight on 1 January 1999 and the replacement of the domestic notes and coins on 1 January 2002. The period *t* is then defined with respect to the implementation of the relevant *big event* being *t=before, during, after* the relevant date. In the case of the non-physical introduction of the euro in 1999, given data availability, *before* corresponds to the period from April 1997 to May 1998, *during* the period November 1998 to April 1999 and *after* the period November 1999 to December 2000. In the case of the physical introduction of the euro in 2002, *before* corresponds to the period May 2000 to May 2001; *during* November 2001 to May 2002 and *after* November 2002 to December 2003.

$\Psi(\cdot)$ is a standard-normal distribution function, X_d corresponds to set of variables identifying the demand side of the formation of beliefs, X_s to the supply side and X to a set of individual characteristics (where country fix effects are included). It is assumed all the variables contained in X_d, X_s and X are exogenous regressors.

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Probit regressions for model (1) are performed using appropriate weighting factors and country fixed effects. The dependent variable is a dummy equal to 1 if the individual is against the introduction of the Euro and 0 if in favor. The covariates included in the matrices X_d and X_s are all discrete dummy variables. Therefore, the appropriate marginal effect I am interested in, or how the probability of being against the introduction of the Euro changes with the covariate $x_k \in X_k,\ k = d,s$ (demand and supply forces) has the form:

$$\frac{\Delta E(y / X_d, X_s, X, t)}{\Delta x_k} = \Psi\left(\hat{\beta}_0 + \sum_{\substack{k=d,s \\ x_k=1}} \hat{\beta}_k X_k + \hat{\beta}\bar{X} \,\middle|\, t \right) - \Psi\left(\hat{\beta}_0 + \sum_{\substack{k=d,s \\ x_k=0}} \hat{\beta}_k X_k + \hat{\beta}\bar{X} \,\middle|\, t \right) \qquad (2)$$

$$t = before, during, after \ \text{"}big\ \ event\text{"}$$

where $\hat{\beta}$'s correspond to the probit estimated coefficients, $\bar{X}_k$ to the sample weighted averaged covariates and $\bar{X}$ to the sample weighted averaged individual characteristics.

In a second step, I will test the existence of a boosting in beliefs before and after the introduction of the Euro, for the two relevant dates in this study: non-physical introduction in 1999 and physical introduction in 2002. Equation (3) summarizes the setting. Comparing with equation (1), three new terms are introduced. *D* is a dummy variable equal to 1 if we are *during* the big event. $X_s D$ and $X_d D$ are included to capture the interaction effect between the dummy variable indicating the big event and the "supply" and "demand" variables for the formation of beliefs.

$$E(y / X_d, X_s, X, D, t) = \Psi(\beta_0 + \beta_d X_d + \beta_s X_s + \beta X + \gamma D + \beta_{dD} X_d D + \beta_{sD} X_s D / t) \qquad (3)$$

The sample is now organized by pairs of contiguous periods in order to get the impact on the probability of being against the Euro before and after the implementation of the policy, with respect to the period of implementation (*during*). Therefore, period *t* is now defined as *t=before-during, after-during.* In the case of the non-physical introduction of the euro in 1999, *before-during* corresponds to April 1997 to April 1999; *after-during* corresponds to November 1998 until December 2000. In the case of the physical introduction of the Euro

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in 2002, *before-during* corresponds to May 2000 until May 2002; *after-during* to November 2001 until December 2003.

There are two sets of relevant results to test the boosting in beliefs before and/or after the big event: the marginal effect for *during* (the dummy *D*) and the marginal effects of the interaction terms $X_d D$ and $X_S D$ in equation 3. The explicit formula for the marginal effect of introducing the Euro is then:

$$\frac{\Delta E(y / X_d, X_s, X, D, t)}{\Delta D} = \Psi\left(\hat{\beta}_0 + \sum_{k=d,s} \hat{\beta}_k X_k + \hat{\beta} X + \hat{\gamma} \cdot 1 + \sum_{k=d,s} \hat{\beta}_{kD} X_k \cdot 1 \;\middle|\; t \right) + \\ - \Psi\left(\hat{\beta}_0 + \sum_{k=d,s} \hat{\beta}_k X_k + \hat{\beta} X + \hat{\gamma} \cdot 0 + \sum_{k=d,s} \hat{\beta}_{kD} X_k \cdot 0 \;\middle|\; t \right) \qquad (4)$$

$$t = before - during, after - during$$

Remember, I am interested in knowing if some of the covariates in X_d and X_s had a significant marginal change explaining the probability of being against the Euro with respect to *during*. Therefore, the marginal effects for the interaction terms are calculated[13]. The interaction marginal effect will be given by:

$$\frac{\Delta^2 E(y / X_d, X_s, X, t)}{\Delta x_k \Delta D} = \frac{\Delta}{\Delta D} \left\{ \begin{array}{l} \Psi\left(\hat{\beta}_0 + \sum_{\substack{k=d,s \\ x_k=1}} \hat{\beta}_k X_k + \hat{\beta} X + \hat{\gamma} \cdot D + \sum_{\substack{k=d,s \\ x_k=1}} \hat{\beta}_{kD} X_k \cdot D \;\middle|\; t \right) + \\ - \Psi\left(\hat{\beta}_0 + \sum_{\substack{k=d,s \\ x_k=0}} \hat{\beta}_k X_k + \hat{\beta} X + \hat{\gamma} \cdot D + \sum_{\substack{k=d,s \\ x_k=0}} \hat{\beta}_{kD} X_k \cdot D \;\middle|\; t \right) \end{array} \right\}$$

$$t = before - during, after - during$$

therefore,

[13] The computation of interaction effects and standard errors in logit and probit models has been widely discussed since Norton, Wang and Ai (2004). The appropriate calculations are not automatically done in Stata for non linear models with interaction terms. The explicit programs are available from the author.

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$$\frac{\Delta^2 E(y/X_d, X_s, X, t)}{\Delta x_k \Delta D} = \left\{ \Psi\left(\hat{\beta}_0 + \sum_{\substack{k=d,s \\ x_k=1}} \hat{\beta}_k X_k + \hat{\beta}X + \hat{\gamma}\cdot 1 + \sum_{\substack{k=d,s \\ x_k=1}} \hat{\beta}_{kD} X_k \cdot 1 \;\middle|\; t \right) - \Psi\left(\hat{\beta}_0 + \sum_{\substack{k=d,s \\ x_k=0}} \hat{\beta}_k X_k + \hat{\beta}X + \hat{\gamma}\cdot 1 + \sum_{\substack{k=d,s \\ x_k=0}} \hat{\beta}_{kD} X_k \cdot 1 \;\middle|\; t \right) \right\} + \right.$$
$$\left. - \left\{ \Psi\left(\hat{\beta}_0 + \sum_{\substack{k=d,s \\ x_k=1}} \hat{\beta}_k X_k + \hat{\beta}X + \hat{\gamma}\cdot 0 + \sum_{\substack{k=d,s \\ x_k=1}} \hat{\beta}_{kD} X_k \cdot 0 \;\middle|\; t \right) - \Psi\left(\hat{\beta}_0 + \sum_{\substack{k=d,s \\ x_k=0}} \hat{\beta}_k X_k + \hat{\beta}X + \hat{\gamma}\cdot 0 + \sum_{\substack{k=d,s \\ x_k=0}} \hat{\beta}_{kD} X_k \cdot 0 \;\middle|\; t \right) \right\} \right. \quad (5)$$

$t = before - during, after - during$

The first term in curly brackets corresponds to the marginal effect of the variable x_k (for example, *identity*=1 if the individual "sees himself as European in the near future" against *identity*=0 if not) on the probability of being against the Euro when D=1 (i.e. *during* the big event). The second term in curly brackets corresponds to the marginal effect of the variable x_k on the probability of being against the Euro when D=0 (i.e. *before* or *after* the big event, when applicable). Therefore, to assess the impact of the interaction terms on the probability of being against the Euro we have to be careful with the sign of each of these terms separately. For example, if the impact of *identity*=1 on the probability of being against the Euro is negative and is more important *during* (D=1) the big event than *before* (D=0), equation (5) would be negative (the first curly bracket is more negative than the second one).

The marginal effects summarized in (2) will be obtained for three different settings, given the two relevant dates for the big event "introduction of the Euro" and the availability of the explanatory variables over time. Remember the main attempt of doing this is to explore the within effect of covariates on the probability of being against the introduction of the Euro. Most of the discrete explanatory variables measure some degree of intensity (for example, for the variable "how often you watch TV", the possible answers are "everyday", "several times a week", "once or twice", "less often" or "never"). We want to see if the probability of being against the Euro is increasing/decreasing/invariant with respect to the intensity measured by the explanatory variables. See appendix 2.5 for the details of the estimated equations.

In order to calculate equations (4) and (5), selected reduced forms for both dates of the introduction of the Euro are estimated. Covariates are redefined as binary variables, losing the within variability, in order to simplify the programming equation (5). Table 2.4 shows

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the redefinition of the relevant variables. See appendix 2.6 for details of the reduced estimated equations.

Table 2.4: Covariates label redefinition for reduced forms equations

	Redefined label
Explanatory variables: Demand side of the formation of beliefs	
explife, expeco, expfin, expunemp, expjob	1 “better or same”, 0 “worse”
identity	1 “national+ European or European+ national or European”; 0 “only national”
poldis	1 “frequently or occasionally”, 0 “never”
persuade	1 “often or from time to time”, 0 “rarely or never”
Explanatory variables: Supply side of the formation of beliefs	
knowledge	*1 “block 4 to* 11-knowing a great deal”, 0 “block 1-knowing nothing to block 3”
newstv, newspaper, newsradio	1 “everyday or several, once, twice times a week or less often”, 0 “never”
trustec, trustep, trustecb	1 “tend to trust”, 2 “tend not to trust”, 0 “do not know”

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2.4. Results

Marginal effects by sample: before, during, after the "big event"

First, I will show and discuss the results for the marginal estimated effects in equation (2) for each of the specifications summarized in appendix 2.5. Notice that the regressions are performed by period and the idea is to have a preliminary *taste* of the impact of the covariates on the probability of being against the introduction of the Euro. Tables 2.5, 2.6 and 2.7 show the results for the non-physical Euro introduction in 1999. Tables 2.8, 2.9 and 2.10 show the results for the one in 2002.

The different specifications for each period (*1999full, 199full2a* and *1999full2b*) take into account the time/variable availability explained in section 2.3. See appendix 2.5 for a detailed summary of variables and the period of availability for each of the specifications.

Table 2.5: Marginal probit effects equation (2), non-physical Euro introduction 1999 (*).

Period	**Before** (April 1997-May 1998)			**During** (Nov 1998-April 1999)			**After** (Nov 1999-Dec 2000)		
Equation name / Explanatory variables	1999full	1999full2a	1999full2b	1999full	1999full2a	1999full2b	1999full	1999full2a	1999full2b
Demand side of the formation of beliefs: X_D	negative (a)**	negative (a)**	negative (a)**	negative (a)**	negative (a)**	negative (a)**	negative (a)**	negative (a)**	negative (a)**
Supply side of the formation of beliefs: X_S	negative (a)**	negative (a)**	negative (a)**	negative (a)**	negative (a)**	negative (a)**	negative (a)**	negative (a)**	negative (a)**
Idiosyncratic characteristics: X									
Country fix effects	yes (b)**	yes (b)**	yes (b)**	yes (b)**	yes (b)**	yes (b)**	yes (b)**	yes (b)**	yes (b)**
Gender==male	-0.078 (12.54)**	-0.085 (6.89)**	-0.065 (6.02)**	-0.065 (9.38)**	-0.044 (4.14)**	-0.044 (4.52)**	-0.079 (12.90)**	-0.065 (7.72)**	-0.065 (10.09)**
Marital status==with couple	-0.020 (3.37)**	-0.025 (2.11)*	-0.009 (0.89)	-0.022 (3.34)**	-0.023 (2.21)*	-0.017 (1.77)	-0.019 (3.22)**	-0.029 (3.62)**	-0.013 (2.09)*
Head of household==yes	0.009 (1.35)	0.008 (0.64)	-0.007 (0.64)	0.010 (1.37)	0.000 (0.01)	0.008 (0.81)	0.017 (2.62)**	0.013 (1.42)	0.016 (2.32)*
Education	-0.009 (13.70)**	-0.007 (5.35)**	-0.002 (1.99)*	-0.008 (10.99)**	-0.005 (4.87)**	-0.002 (2.51)*	-0.01 (15.31)**	-0.006 (6.99)**	-0.004 (6.12)**
Age	0.001 (5.03)**	0.000 (0.47)	0.000 (0.67)	0.001 (4.77)**	0.001 (1.59)	0.000 (0.43)	0.002 (10.41)**	0.001 (5.17)**	0.001 (5.30)**
Observations	41703	11064	13315	27792	11391	13671	42440	22883	41015

Robust z statistics in parentheses
* significant at 5%; ** significant at 1%
(a) The detailed coefficients and z-statistic values are shown separately in tables 2.6 and 2.7.
(b) See annex 2.7 for detailed z-statistic values.
(*) See appendix 2.7 for details.

Looking at table 2.5, the first relevant fact is that the sign for the covariates related to the supply and demand sides of the formation of beliefs are negative, consistent with the economic intuition: the probability of being against the Euro decreases with variables reflecting self-serving beliefs (demand side) and the influence of interested actors (supply side). Separate tables showing the detailed results for all the variables in each side of

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influence will follow, to explore the within variation of intensity on the probability of being against the Euro.

The marginal effects of the individual characteristics show that men are, on average, 5-8% less likely to be against the Euro than women across specifications; more education has practically no effect: it tends to decrease the probability of being against the Euro by less than 1%. The same happens with the effect of age. There is some evidence showing that people in couples tend to be 2% less against the Euro than people without a partner and that heads of households are on average 1-2% more against the single currency. The country fixed effects that I will discuss here are applicable to almost every regression in what follows[14]. All the coefficients are calculated with respect to the United Kingdom, a country very much against the introduction of the Euro. The marginal effects are statistically significant for almost every country, Italy being the most pro-Euro country (with a negative marginal effect of 30-40%) followed by Spain, Portugal and Ireland. Sweden and Denmark are not very different than UK and the country with the less negative marginal fixed effect is Germany (around -10%).

Table 2.6 shows the marginal effects on the probability of being against the Euro for the variables associated with the demand side of the formation of beliefs. If we look at the first specification (1999full) *before* the big event 1999, the marginal effect of political discussion on the probability of being against the Euro becomes more negative when it is done more frequently. This pattern is also observed *during* and *after* the big event. The impact is very low in any case, around 2-5% with respect to no sustained political discussion at all. *Persuade friends* also has a negative effect (~2-3%) on the probability of being against the Euro across relevant periods. The role of optimistic expectations impacts negatively and increasingly in module on the probability of being against the single currency. For example, the effect of the discrete variable related to expectation for the next year about the economy in your country is based on the excluded category "I expect it to be worse". If the person thinks the economy will behave "the same" instead of "worse", the probability diminishes by 9%; if "better", the probability of being against the Euro decreases additional 5 percentage points. Finally, the variable reflecting the European identity feeling of the

[14] For detailed coefficients look at the respective appendix indicated in the bottom of each table.

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citizens has a negative impact, around 20%, diminishing the probability of being against the single currency (the excluded category is "only national"). The impact seems to be invariant to the intensity of the feeling.

Table 2.6: Marginal probit effects equation (2), Demand Side of the formation of Beliefs (X_D), non-physical Euro introduction 1999 (*).

Period	**Before** (April 1997-May 1998)			**During** (Nov 1998-April 1999)			**After** (Nov 1999-Dec 2000)		
Equation name	1999full	1999full2a	1999full2b	1999full	1999full2a	1999full2b	1999full	1999full2a	1999full2b
Explanatory variables									
Demand side of the formation of beliefs: X_D									
Political discussion==occasionally	-0.025	-0.024	0.025	-0.046	-0.041	-0.024	-0.048	-0.022	-0.001
	(3.51)**	(1.67)	(2.03)*	(5.77)**	(3.25)**	(2.08)*	(7.09)**	(2.35)*	(0.07)
Political discussion==frequently	-0.048	-0.043	0.033	-0.054	-0.036	-0.005	-0.064	-0.013	0.011
	(4.72)**	(2.09)*	(1.77)	(4.82)**	(2.08)*	(0.33)	(6.36)**	(0.90)	(0.97)
Persuade friends==rarely	-0.028	-0.003	-0.025	-0.028	-0.013	-0.020	-0.025	-0.015	-0.005
	(3.36)**	(0.20)	(1.82)	(3.01)**	(0.91)	(1.52)	(3.18)**	(1.40)	(0.57)
Persuade friends==from time to time	-0.034	-0.007	-0.014	-0.037	-0.023	-0.006	-0.058	-0.038	-0.030
	(4.32)**	(0.46)	(1.01)	(4.14)**	(1.71)	(0.45)	(7.54)**	(3.55)**	(3.77)**
Persuade friends==often	-0.024	-0.009	-0.005	-0.024	0.022	0.010	-0.040	-0.026	-0.018
	(2.31)*	(0.43)	(0.27)	(2.03)*	(1.18)	(0.56)	(3.87)**	(1.86)	(1.67)
Expectation for the next year									
Life in general==same		-0.053			-0.057			-0.069	
		(2.54)*			(2.93)**			(4.02)**	
Life in general==better		-0.077			-0.063			-0.092	
		(3.36)**			(3.09)**			(5.05)**	
Economy in your country==same		-0.085			-0.049			-0.061	
		(5.43)**			(3.77)**			(5.56)**	
Economy in your country==better		-0.143			-0.094			-0.098	
		(7.78)**			(5.83)**			(7.61)**	
Financial situation household==same		0.003			-0.072			-0.044	
		(0.18)			(4.29)**			(3.11)**	
Financial situation household==better		0.012			-0.076			-0.012	
		(0.54)			(4.02)**			(0.73)	
Unemloyment in your country==same		-0.04			-0.013			-0.021	
		(2.54)*			(0.97)			(1.94)	
Unemloyment in your country==better		-0.086			-0.044			-0.079	
		(4.70)**			(2.82)**			(6.41)**	
Personal job situation==same		-0.025			-0.043			-0.039	
		(1.13)			(2.15)*			(2.25)*	
Personal job situation==better		-0.022			-0.036			-0.032	
		(0.88)			(1.58)			(1.69)	
Identity==(nationality) and european			-0.216			-0.241			-0.256
			(21.87)**			(26.40)**			(43.06)**
Identity==european and (nationality)			-0.229			-0.219			-0.251
			(12.95)**			(14.62)**			(23.38)**
Identity==european only			-0.213			-0.188			-0.237
			(10.27)**			(10.12)**			(17.52)**
Observations	41703	11064	13315	27792	11391	13671	42440	22883	41015

Robust *z* statistics in parentheses
* significant at 5%; ** significant at 1%

Table 2.7 shows the marginal effects on the probability of being against the Euro for the variables associated with the supply side of the formation of beliefs. As can be seen, they also have a negative effect on the probability of being against the Euro when significant. The high frequency exposure to newspapers ("everyday") has a negative impact on the probability of being against the Euro, varying from 5 to 8% across specifications. There is also some evidence of the pro-Euro effect of high frequency exposure to TV and radio (between 2 and 9%). Remember the excluded category is "never". The variable reflecting the knowledge citizens have about European institutions has a negative marginal effect and increasing in module for most of the specifications, especially the ones for *after* the big

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event: the more you know about European institutions, the less you are against the introduction of the Euro.

Table 2.7: Marginal probit effects equation (2), Supply side of the formation of Beliefs (X_S), non-physical Euro introduction 1999 (*).

Period	Before (April 1997-May 1998)			During (Nov 1998-April 1999)			After (Nov 1999-Dec 2000)		
Equation name	1999full	1999full2a	1999full2b	1999full	1999full2a	1999full2b	1999full	1999full2a	1999full2b
Explanatory variables									
Supply side of the formation of beliefs: X_S									
News TV==less often	-0.004	-0.087	-0.018	0.030	-0.019	0.003	-0.024	-0.005	-0.009
	(0.14)	(1.47)	(0.33)	(0.88)	(0.35)	(0.07)	(0.86)	(0.11)	(0.32)
News TV==once or twice a week	-0.029	-0.049	-0.054	-0.042	-0.047	-0.014	-0.022	-0.015	0.000
	(1.07)	(0.90)	(1.13)	(1.38)	(0.96)	(0.34)	(0.84)	(0.41)	(0.01)
News TV==several times a week	-0.038	-0.04	-0.078	-0.041	-0.032	-0.005	-0.048	-0.025	-0.018
	(1.46)	(0.78)	(1.73)	(1.41)	(0.66)	(0.14)	(1.99)*	(0.71)	(0.69)
News TV==everyday	-0.064	-0.047	-0.095	-0.058	-0.048	-0.027	-0.055	-0.036	-0.02
	(2.47)*	(0.92)	(1.99)*	(1.91)	(0.97)	(0.74)	(2.27)*	(1.02)	(0.77)
Newspaper==less often	-0.020	0.027	-0.020	-0.021	-0.035	-0.031	-0.031	0.000	-0.013
	(1.67)	(1.08)	(0.92)	(1.64)	(1.79)	(1.75)	(2.77)**	(0.02)	(1.08)
Newspaper==once or twice a week	-0.009	0.013	0.008	-0.030	-0.033	-0.041	-0.046	-0.023	-0.020
	(0.77)	(0.53)	(0.39)	(2.36)*	(1.68)	(2.33)*	(4.16)**	(1.43)	(1.72)
Newspaper==several times a week	-0.028	0.009	-0.002	-0.029	-0.016	-0.028	-0.051	-0.008	-0.019
	(2.39)*	(0.36)	(0.11)	(2.35)*	(0.83)	(1.60)	(4.64)**	(0.52)	(1.64)
Newspaper==everyday	-0.061	-0.015	-0.056	-0.061	-0.052	-0.05	-0.087	-0.038	-0.05
	(5.62)**	(0.65)	(2.86)**	(5.30)**	(2.89)**	(3.05)**	(8.50)**	(2.59)**	(4.56)**
News Radio==less often	-0.022	-0.002	-0.022	-0.040	-0.011	-0.009	-0.023	-0.006	-0.015
	(1.94)	(0.07)	(1.11)	(3.31)**	(0.56)	(0.50)	(2.11)*	(0.38)	(1.30)
News Radio==once or twice a week	-0.015	-0.019	0.005	-0.007	0.014	0.008	-0.039	-0.031	-0.024
	(1.15)	(0.73)	(0.24)	(0.54)	(0.69)	(0.44)	(3.30)**	(1.93)	(1.97)*
News Radio==several times a week	-0.019	0.008	-0.018	-0.018	-0.004	0.002	-0.024	-0.012	-0.009
	(1.65)	(0.35)	(0.92)	(1.47)	(0.20)	(0.12)	(2.26)*	(0.82)	(0.81)
News Radio==everyday	-0.024	0.004	-0.029	-0.042	-0.024	-0.017	-0.033	-0.013	-0.022
	(2.39)*	(0.19)	(1.64)	(3.86)**	(1.41)	(1.12)	(3.44)**	(0.98)	(2.14)*
Knowledge about the EU, its policies and its institutions									
knowledge==box 2		-0.019	-0.056		-0.046	-0.019		-0.060	-0.037
		(0.75)	(2.73)**		(2.18)*	(0.99)		(3.36)**	(2.87)**
knowledge==box 3		-0.016	-0.067		-0.077	-0.054		-0.097	-0.083
		(0.68)	(3.37)**		(3.92)**	(3.07)**		(5.88)**	(6.82)**
knowledge==box 4		-0.041	-0.070		-0.088	-0.054		-0.128	-0.104
		(1.72)	(3.45)**		(4.42)**	(2.99)**		(7.84)**	(8.49)**
knowledge==box 5		-0.078	-0.090		-0.112	-0.070		-0.153	-0.128
		(3.37)**	(4.48)**		(5.70)**	(3.86)**		(9.52)**	(10.67)**
knowledge==box 6		-0.124	-0.091		-0.136	-0.101		-0.178	-0.141
		(4.92)**	(4.18)**		(6.69)**	(5.27)**		(10.71)**	(11.04)**
knowledge==box 7		-0.165	-0.115		-0.123	-0.084		-0.193	-0.159
		(6.04)**	(4.89)**		(5.52)**	(3.97)**		(11.26)**	(11.98)**
knowledge==box 8		-0.146	-0.092		-0.142	-0.109		-0.206	-0.176
		(4.45)**	(3.26)**		(5.66)**	(4.63)**		(10.79)**	(11.84)**
knowledge==box 9		-0.119	-0.086		-0.122	-0.055		-0.218	-0.186
		(2.27)*	(1.99)*		(3.03)**	(1.28)		(7.44)**	(8.40)**
knowledge==know a great deal		-0.097	-0.015		-0.174	-0.109		-0.194	-0.153
		(1.56)	(0.26)		(2.97)**	(2.35)*		(5.80)**	(5.93)**
Observations	41703	11064	13315	27792	11391	13671	42440	22883	41015

Robust z statistics in parentheses
* significant at 5%; ** significant at 1%

Looking at table 2.8, we observe very similar behavior for the repeated variables that were discussed for the non-physical introduction of the Euro. For the variables on the demand and supply sides of the formation of beliefs, we observe negative and significant impact on the probability of being against the Euro, as before. Separate tables for each side of the formation of beliefs are displayed later to explore the within variation of intensity on the probability of being against the Euro. There is evidence of 6-8% lower likelihood of men to be against the Euro across specifications. People in couples are 2% more probably pro-

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Euro than people without a partner, when significant. Educations has statistically significant negative effect of the probability of being against the Euro, but very low, smaller than 1% across specifications. Finally, the age of the individual seems to have no effect on the probability of being against the Euro.

Table 2.8: Marginal probit effects equation (2), physical Euro introduction 2002 (*).

Period	Before (May 2000-May 2001)			During (Nov 2001-Nov 2002)			After (Nov 2002-Dec 2003)		
Equation name	2002full	2002full2a	2002full2b	2002full	2002full2a	2002full2b	2002full	2002full2a	2002full2b
Explanatory variables									
Demand side of the formation of beliefs: X_D	negative (a)**	negative (a)**	negative (a)**	negative (a)**	negative (a)**	negative (a)**	negative (a)**	negative (a)**	negative (a)**
Supply side of the formation of beliefs: X_S	negative (a)**	negative (a)**	negative (a)**	negative (a)**	negative (a)**	negative (a)**	negative (a)**	negative (a)**	negative (a)**
Idiosyncratic characteristics: X									
Country fix effects	yes (b)**	yes (b)**	yes (b)**	yes (b)**	yes (b)**	yes (b)**	yes (b)**	yes (b)**	yes (b)**
Gender==male	-0.070 (11.11)**	-0.075 (5.92)**	-0.064 (4.67)**	-0.065 (9.81)**	-0.059 (8.00)**	-0.061 (5.09)**	-0.058 (10.66)**	-0.067 (6.07)**	-0.058 (4.83)**
Marital status==with couple	-0.016 (2.60)**	-0.021 (1.73)	-0.029 (2.21)*	-0.012 (1.83)	-0.001 (0.20)	0.004 (0.32)	-0.023 (4.39)**	-0.009 (0.84)	-0.016 (1.37)
Head of household==yes	0.013 (1.85)	0.031 (2.23)*	0.016 (1.06)	-0.001 (0.17)	-0.011 (1.37)	-0.022 (1.68)	0.009 (1.55)	0.013 (1.06)	0.000 (0.01)
Education	-0.007 (10.91)**	-0.005 (3.54)**	-0.004 (2.89)**	-0.007 (9.10)**	-0.004 (5.40)**	-0.004 (3.55)**	-0.008 (13.08)**	-0.007 (5.97)**	-0.006 (4.96)**
Age	0.001 (6.69)**	0.001 (2.39)*	0.001 (1.81)	0.001 (5.35)**	0.000 (1.04)	0.000 (0.59)	0.001 (7.02)**	0.001 (1.76)	0.001 (1.55)
Observations	41848	11250	9422	28046	22774	9462	43302	11582	9700

Robust z statistics in parentheses
* significant at 5%; ** significant at 1%
(a) The detailed coefficients and z-statistic values are shown separately in tables 2.9 and 2.10.
(b) See annex 2.8 for detailed z-statistic values.
(*) See appendix 2.8 for details.

Table 2.9 shows the marginal probit impact of variables associated to the supply side of the formation of beliefs on the probability of being against the Euro. The role of political discussion is negative and increasing in the frequency (the excluded category is "never"), diminishing by 2-3% the probability of being against the Euro when people hold political discussions "occasionally" and decreasing an extra 2 percentage points when they do it "frequently". The role of *persuade friends* is not robust across specification, even though it is negative and around 2% when significant. *European identity* decreases the probability by 20% (excluded category "only national") and optimistic expectations for the next year also impact negatively, around 4-8%. Life satisfaction was a new variable available for the second big event (physical introduction of the single currency) and its impact ranges from a 8% to 12% decrease in the probability of being against when the intensity increases from "fairly satisfied" to "very satisfied", respectively (excluded category "not satisfied").

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Table 2.9: Marginal probit effects equation (2), Demand side of the formation of Beliefs, physical Euro introduction 2002 (*).

Period	Before (May 2000-May 2001)			During (Nov 2001-Nov 2002)			After (Nov 2002-Dec 2003)		
Equation name	2002full	2002full2a	2002full2b	2002full	2002full2a	2002full2b	2002full	2002full2a	2002full2b
Explanatory variables									
Demand side of the formation of beliefs: X_D									
Political discussion==occasionally	-0.019	-0.025	-0.025	-0.026	-0.011	-0.030	-0.036	-0.008	0.003
	(2.72)**	(1.74)	(1.60)	(3.35)**	(1.30)	(2.25)*	(5.55)**	(0.64)	(0.19)
Political discussion==frequently	-0.059	-0.053	-0.056	-0.044	-0.025	-0.057	-0.054	-0.022	-0.017
	(5.56)**	(2.59)**	(2.55)*	(4.06)**	(2.10)*	(3.01)**	(6.08)**	(1.21)	(0.88)
Persuade friends==rarely	-0.017	-0.013	-0.017	0.002	0.012	-0.001	-0.008	-0.037	-0.029
	(2.01)*	(0.74)	(0.90)	(0.25)	(1.16)	(0.09)	(1.14)	(2.49)*	(1.80)
Persuade friends==from time to time	-0.032	-0.020	-0.014	-0.016	-0.002	-0.012	-0.015	-0.016	-0.014
	(3.97)**	(1.20)	(0.78)	(1.87)	(0.17)	(0.80)	(2.13)*	(1.10)	(0.87)
Persuade friends==often	-0.016	-0.030	-0.030	-0.008	0.004	-0.035	-0.009	-0.016	-0.021
	(1.47)	(1.40)	(1.27)	(0.74)	(0.32)	(1.80)	(0.99)	(0.85)	(1.02)
Life satisfaction==not very satisfied		-0.044	-0.048		-0.011	-0.019		-0.036	-0.030
		(1.22)	(1.23)		(0.54)	(0.55)		(1.26)	(0.95)
Life satisfaction==fairly satisfied		-0.069	-0.031		-0.091	-0.077		-0.108	-0.088
		(1.99)*	(0.80)		(4.48)**	(2.20)*		(3.80)**	(2.80)**
Life satisfaction==very satisfied		-0.071	-0.035		-0.107	-0.105		-0.126	-0.103
		(1.99)*	(0.87)		(5.49)**	(3.10)**		(4.51)**	(3.27)**
Identity==(nationality) and european		-0.248	-0.256		-0.190	-0.172		-0.176	-0.181
		(20.95)**	(19.93)**		(26.80)**	(15.14)**		(16.24)**	(15.45)**
Identity==european and (nationality)		-0.234	-0.236		-0.193	-0.198		-0.221	-0.234
		(10.05)**	(9.49)**		(16.19)**	(9.68)**		(11.43)**	(11.61)**
Identity==european only		-0.217	-0.205		-0.186	-0.177		-0.159	-0.166
		(7.23)**	(6.18)**		(11.91)**	(6.80)**		(5.87)**	(5.91)**
National pride==not very proud		0.004	0.016		-0.027	-0.013		0.016	0.015
		(0.10)	(0.35)		(1.13)	(0.32)		(0.41)	(0.36)
National pride==fairly proud		0.007	0.030		-0.053	-0.003		-0.002	0.003
		(0.18)	(0.72)		(2.34)*	(0.07)		(0.07)	(0.09)
National pride==very proud		0.026	0.047		-0.027	0.028		0.019	0.019
		(0.69)	(1.10)		(1.20)	(0.75)		(0.52)	(0.50)
Expectation for the next year									
Life in general==same			-0.019			-0.041			-0.030
			(0.71)			(1.89)			(1.52)
Life in general==better			-0.063			-0.055			-0.020
			(2.18)*			(2.33)*			(0.90)
Economy in your country==same			-0.012			-0.010			-0.050
			(0.70)			(0.72)			(3.49)**
Economy in your country==better			-0.045			-0.038			-0.079
			(2.11)*			(1.88)			(4.03)**
Financial situation household==same			-0.048			-0.056			-0.004
			(2.08)*			(2.90)**			(0.24)
Financial situation household==better			-0.008			-0.054			0.012
			(0.30)			(2.39)*			(0.57)
Unemloyment in your country==same			-0.033			0.020			-0.009
			(1.83)			(1.42)			(0.64)
Unemloyment in your country==better			-0.066			-0.006			-0.003
			(3.16)**			(0.29)			(0.15)
Personal job situation==same			-0.067			-0.029			-0.012
			(2.43)*			(1.26)			(0.57)
Personal job situation==better			-0.054			-0.019			0.008
			(1.80)			(0.72)			(0.31)
Observations	41848	11250	9422	28046	22774	9462	43302	11582	9700

Robust z statistics in parentheses
* significant at 5%; ** significant at 1%

For the variables on the supply side of the formation of beliefs, measures of trust in national and European institutions were included in place of the variables associated with press exposure, which are no longer available for this period. The impact of these variables is high and consistent with the intuition (missing category "I do not know"). If people have a tendency "not to trust" European institutions (European Parliament, Commission and Central Bank) the effect on the probability of being against the Euro is positive, around 8%. If people tend "to trust" the institutions, the probability decreases by 7-10%. To trust political parties also has a negative effect on the probability of being

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against the Euro, but lower (~4-8%). Finally, as before, the impact of the knowledge citizens have about European institutions has an increasingly negative effect on the probability of being against the Euro.

Table 2.10: Marginal probit effects equation (2), Supply side of the formation of Beliefs, physical Euro introduction 2002 (*).

Period	**Before** (May 2000-May 2001)			**During** (Nov 2001-Nov 2002)			**After** (Nov 2002-Dec 2003)		
Equation name	2002full	2002full2a	2002full2b	2002full	2002full2a	2002full2b	2002full	2002full2a	2002full2b
Explanatory variables									
Supply side of the formation of beliefs: X $_S$									
Knowledge about the EU, its policies and its institutions									
knowledge==box 2	-0.043	-0.076	-0.074	-0.053	-0.028	-0.092	-0.050	-0.034	-0.034
	(3.34)**	(2.62)**	(2.26)*	(4.04)**	(1.81)	(3.48)**	(4.55)**	(1.39)	(1.22)
knowledge==box 3	-0.082	-0.055	-0.072	-0.098	-0.070	-0.095	-0.071	-0.056	-0.070
	(6.86)**	(2.00)*	(2.35)*	(8.10)**	(4.97)**	(3.81)**	(6.90)**	(2.45)*	(2.73)**
knowledge==box 4	-0.088	-0.069	-0.076	-0.102	-0.067	-0.111	-0.091	-0.083	-0.089
	(7.25)**	(2.54)*	(2.46)*	(8.38)**	(4.76)**	(4.53)**	(8.77)**	(3.59)**	(3.50)**
knowledge==box 5	-0.123	-0.086	-0.086	-0.128	-0.083	-0.122	-0.089	-0.065	-0.067
	(10.41)**	(3.21)**	(2.84)**	(10.76)**	(5.97)**	(4.99)**	(8.62)**	(2.77)**	(2.58)**
knowledge==box 6	-0.136	-0.110	-0.116	-0.136	-0.090	-0.145	-0.102	-0.084	-0.086
	(10.67)**	(3.89)**	(3.69)**	(10.79)**	(6.07)**	(5.80)**	(9.34)**	(3.43)**	(3.18)**
knowledge==box 7	-0.160	-0.103	-0.118	-0.141	-0.082	-0.137	-0.102	-0.047	-0.049
	(11.92)**	(3.45)**	(3.59)**	(10.65)**	(5.13)**	(5.29)**	(8.74)**	(1.78)	(1.66)
knowledge==box 8	-0.179	-0.171	-0.177	-0.140	-0.070	-0.115	-0.100	-0.061	-0.050
	(11.94)**	(5.45)**	(5.20)**	(9.19)**	(3.80)**	(3.77)**	(7.43)**	(1.98)*	(1.49)
knowledge==box 9	-0.178	-0.170	-0.185	-0.131	-0.080	-0.138	-0.091	-0.032	-0.020
	(7.54)**	(3.50)**	(3.62)**	(5.62)**	(2.75)**	(3.01)**	(4.25)**	(0.71)	(0.42)
knowledge==know a great deal	-0.151	-0.092	-0.107	-0.169	-0.132	-0.151	-0.051	0.044	0.023
	(5.67)**	(1.70)	(1.89)	(6.03)**	(3.63)**	(2.48)*	(2.00)*	(0.85)	(0.41)
Trust in National and International Institutions									
European Parliament==tend to trust	-0.075	-0.041	-0.012	-0.069	-0.068	-0.062	-0.090	-0.066	-0.100
	(6.13)**	(1.57)	(0.42)	(5.31)**	(4.42)**	(2.45)*	(8.56)**	(2.98)**	(4.10)**
European Parliament==tend not to trust	0.092	0.109	0.140	0.061	0.045	0.064	0.068	0.095	0.052
	(6.50)**	(3.78)**	(4.27)**	(3.95)**	(2.54)*	(2.18)*	(5.32)**	(3.75)**	(1.87)
European Comision==tend to trust	-0.076	-0.079	-0.089	-0.060	-0.042	-0.049	-0.065	-0.070	-0.029
	(6.51)**	(3.35)**	(3.33)**	(4.87)**	(2.96)**	(2.11)*	(6.61)**	(3.42)**	(1.31)
European Comision==tend not to trust	0.041	0.026	0.001	0.068	0.055	0.056	0.044	0.039	0.071
	(3.14)**	(1.02)	(0.02)	(4.65)**	(3.34)**	(2.11)*	(3.67)**	(1.68)	(2.79)**
European Central Bank==tend to trust	-0.103	-0.083	-0.080	-0.069	-0.059	-0.080	-0.092	-0.098	-0.092
	(11.67)**	(4.42)**	(3.83)**	(7.17)**	(5.25)**	(4.32)**	(12.17)**	(6.30)**	(5.37)**
European Central Bank==tend not to trust	0.084	0.049	0.042	0.084	0.079	0.070	0.084	0.069	0.076
	(8.11)**	(2.34)*	(1.83)	(7.12)**	(5.94)**	(3.26)**	(9.03)**	(3.78)**	(3.80)**
Press==tend to trust		0.003	-0.003		-0.021	-0.021		-0.014	-0.005
		(0.21)	(0.16)		(2.49)*	(1.57)		(1.11)	(0.33)
Radio==tend to trust		-0.036	-0.025		0.017	0.035		0.011	0.002
		(1.83)	(1.16)		(1.62)	(2.03)*		(0.73)	(0.12)
TV==tend to trust		0.031	0.025		0.023	0.015		0.015	0.016
		(1.69)	(1.23)		(2.34)*	(0.91)		(1.07)	(1.05)
Political parties==tend to trust		-0.080	-0.067		-0.040	-0.050		-0.034	-0.018
		(5.53)**	(4.26)**		(4.91)**	(3.85)**		(2.60)**	(1.22)
Observations	41848	11250	9422	28046	22774	9462	43302	11582	9700

Robust z statistics in parentheses
* significant at 5%; ** significant at 1%

Overall, these results support the theoretical framework discussed, in the sense that individuals hold self-serving beliefs and that there is some degree of political/institutional/media manipulation.

Notice that by simple inspection, differences in the magnitude of the coefficients for the same covariate are observed across periods (*before, during, after*). In what follows we check if there is a significant change in the marginal effects on the probability of being against the Euro of demand and supply side variables before and after the big events.

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Marginal interaction effects, reduced forms

I will show and discuss the results for the marginal and interaction estimated effects in equations (4) and (5) for each of the reduced form specifications summarized in appendix 2.6. As a measure of caution, I re-estimated equation (2) for these reduced forms to be able to contrast these more rough results with the ones gotten before. By simple inspection the results for the reduced form equations are consistent with the respective previous equations: both sets of variables associated with the demand and supply sides of the formation of beliefs have a statistically significant effect, reducing the probability of being against the Euro. This is shown in tables 2.11 and 2.12, along with the interaction marginal effect, for the non-physical Euro introduction in 1999 and tables 2.13 and 2.14 show the same effects for the physical introduction of the single currency in 2002.

Looking at tables 2.11 and 2.12 (for the big event in 1999) we observe that the boosting in beliefs seems to be relevant only when we observe the sample *after-during*. There is a significant effect of 9-10 percentage points in the probability of being against the Euro after the non-physical introduction of the single currency[15]. However, there is no marginal effect significantly different from zero if we compare the belief during the non-physical introduction of the single currency with the period immediately before. One possible explanation could be that people were not really aware of the change and they only start realizing the non-physical introduction later, consistent with the later change in beliefs trough being more against the introduction of the Euro.

The interaction marginal effects for the 1999 introduction are not significantly different from zero in most of cases, i.e. the demand and supply side variables do not have a different effect with respect to influence before and after the big event. In the case of the sample *before-during* in table 2.12, the exception is the marginal effect of the interaction between *political discussion* (the demand side of formation of beliefs) and the *big event*: the influence of political discussion in decreasing the probability of being against the Euro was more important during the introduction of the single currency (3 percentage points smaller before the big event). The last is consistent with stronger self-serving beliefs in the sense

[15] The estimated marginal effect for Big Event in table 2.11 is significant at 10% confidence interval, equal to -8.6%.

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of the benefits of convincing others about the goodness of the Euro, especially close to the date of implementation.

For the reduced forms in table 2.11, when variables related to expectation for the next year are included, the marginal effect of the interaction between the financial situation of household and the big event becomes significant: the influence of optimistic expectation of the financial situation for the next year in decreasing the probability of being against the Euro was 9 percentage points more important during the introduction of the Euro than before. These two variables correspond to the demand side of the formation of beliefs. Therefore, self-serving beliefs seem to be *demanded* more by individuals closer to the date of implementation.

In the case of the sample *after-during* for the 1999 introduction, the marginal effect of the interaction of *persuade friends* and *knowledge* with the big event is positive for both specifications in tables 2.11 and 2.12, meaning that the importance in reducing the probability of being against the Euro was higher after the big event (4 and 5 percentage points higher, respectively). In the first case, self serving beliefs seem to prevail after the non-physical introduction of the Euro (*I keep persuading friends*). In the second case, the supply of information "you like the Euro" coming from European institutions, which is expected to be captured by the variable *knowledge*, was sustained or even increased after the non-physical introduction. One plausible explanation would be the need to prepare the population for the coming physical introduction of the single currency in 2002.

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Table 2.11: Reduced forms, interaction effect (5) non-physical Euro intro 1999a (*).

Period Explanatory variables	'before'	'during'	'after'	'before/during interaction'	after/during interaction'
Big event=during				-0.017	-0.086
				(0.20)	(1.17)
Demand side of the formation of beliefs: X_D					
Political discussion=yes	-0.034	-0.054	-0.038	-0.037	-0.039
	(2.55)*	(4.50)**	(4.25)**	(2.93)**	(4.47)**
Persuade Friends=yes	-0.017	-0.014	-0.032	-0.013	-0.032
	(1.47)	(1.37)	(4.14)**	(1.25)	(4.39)**
Expectation for the next year					
Life in general==same or better	-0.058	-0.064	-0.079	-0.053	-0.075
	(2.80)**	(3.20)**	(4.49)**	(2.71)**	(4.41)**
Economy in your country==same or better	-0.107	-0.066	-0.078	-0.099	-0.075
	(7.06)**	(5.10)**	(7.20)**	(6.93)**	(7.15)**
Financial situation household==same or better	0.002	-0.081	-0.043	0.003	-0.04
	(0.10)	(4.68)**	(3.00)**	(0.18)	(2.93)**
Unemployment in your country==same or better	-0.064	-0.029	-0.046	-0.053	-0.041
	(4.25)**	(2.27)*	(4.30)**	(3.85)**	(4.03)**
Personal job situation==same or better	-0.024	-0.04	-0.038	-0.026	-0.035
	(1.09)	(1.94)	(2.19)*	(1.28)	(2.09)*
Supply side of the formation of beliefs: X_S					
News TV=yes	-0.044	-0.042	-0.042	-0.043	-0.04
	(0.85)	(0.75)	(1.19)	(0.89)	(1.18)
Newspaper=yes	0.004	-0.048	-0.031	0.001	-0.028
	(0.18)	(2.88)**	(2.35)*	(0.04)	(2.19)*
News Radio=yes	-0.005	-0.018	-0.021	-0.010	-0.026
	(0.26)	(1.15)	(1.72)	(0.54)	(2.22)*
Knowledge EU (policy, institutions)	-0.083	-0.074	-0.112	-0.079	-0.113
	(6.92)**	(6.84)**	(13.29)**	(7.13)**	(13.90)**
Interaction terms					
poldis*during				-0.017	-0.011
				(0.96)	(0.76)
persuade*during				-0.006	0.024
				(0.38)	(1.95)*
explife*during				-0.015	0.011
				(0.05)	(0.42)
expeco*during				0.032	0.009
				(1.54)	(0.57)
expfin*during				-0.091	-0.036
				(3.55)**	(1.64)
expunemp*during				0.018	0.016
				(0.93)	(1.02)
expjob*during				-0.012	-0.007
				(0.39)	(0.24)
newstv*during				0.004	0.011
				(0.05)	(0.16)
newspaper*during				-0.049	-0.022
				(1.87)	(1.09)
newsradio*during				-0.006	0.018
				(0.24)	(0.94)
knowledge*during				0.007	0.052
				(0.41)	(3.68)**
Idiosyncratic characteristics: X					
Country fix effects	yes	yes	yes	yes	yes
	(a)**	(a)**	(a)**	(a)**	(a)**
Gender==male	-0.098	-0.05	-0.075	-0.075	-0.066
	(8.06)**	(4.72)**	(8.98)**	(9.04)**	(10.07)**
Marital status==with couple	-0.026	-0.025	-0.031	-0.026	-0.029
	(2.21)*	(2.45)*	(3.92)**	(3.28)**	(4.57)**
Head of household==yes	0.009	0.001	0.013	0.004	0.009
	(0.68)	(0.11)	(1.39)	(0.49)	(1.21)
Education	-0.008	-0.006	-0.007	-0.007	-0.007
	(6.50)**	(5.57)**	(8.62)**	(8.61)**	(10.40)**
Age	0.000	0.000	0.001	0.000	0.001
	(0.84)	(1.31)	(4.65)**	(0.41)	(4.58)**
Observations	11064	11391	22883	22455	34274

Robust z statistics in parentheses
* significant at 5%; ** significant at 1%
(*) See appendix 2.9 for details.

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Table 2.12: Reduced forms, interaction effect (5) non-physical Euro intro 1999b (*).

Period / Explanatory variables	'before'	'during'	'after'	'before/during interaction'	after/during interaction'
Big event=during				-0.057	-0.111
				(0.95)	(2.38)*
Demand side of the formation of beliefs: X_D					
Political discussion=yes	0.009	-0.033	-0.01	0.005	-0.011
	(0.81)	(3.01)**	(1.52)	(0.44)	(1.70)
Persuade Friends=yes	0.003	0.006	-0.028	0.004	-0.029
	(0.26)	(0.69)	(4.79)**	(0.43)	(5.07)**
Identity pro european	-0.238	-0.265	-0.277	-0.226	-0.27
	(24.51)**	(28.70)**	(47.20)**	(24.58)**	(47.68)**
Supply side of the formation of beliefs: X_S					
News TV=yes	-0.099	-0.018	-0.022	-0.097	-0.022
	(2.01)*	(0.47)	(0.86)	(2.02)*	(0.88)
Newspaper=yes	-0.033	-0.048	-0.036	-0.029	-0.033
	(1.80)	(3.18)**	(3.66)**	(1.68)	(3.47)**
News Radio=yes	-0.03	-0.013	-0.022	-0.026	-0.024
	(1.78)	(0.92)	(2.37)*	(1.62)	(2.59)**
Knowledge EU (policy, institutions)	-0.044	-0.048	-0.09	-0.044	-0.09
	(4.22)**	(4.86)**	(13.95)**	(4.45)**	(14.41)**
Interaction terms					
poldis*during				-0.034	-0.017
				(2.21)*	(1.39)
persuade*during				0.000	0.042
				(0.01)	(3.91)**
identity*during				-0.024	0.026
				(1.24)	(1.32)
newstv*during				0.082	0.009
				(1.26)	(0.19)
newspaper*during				-0.018	-0.018
				(0.76)	(1.04)
newsradio*during				0.011	0.016
				(0.51)	(0.96)
knowledge*during				0.001	0.054
				(0.40)	(4.96)**
Idiosyncratic characteristics: X					
Country fix effects	yes	yes	yes	yes	yes
	(a)**	(a)**	(a)**	(a)**	(a)**
Gender==male	-0.072	-0.049	-0.073	-0.06	-0.067
	(6.75)**	(5.00)**	(11.49)**	(8.30)**	(12.51)**
Marital status==with couple	-0.014	-0.019	-0.016	-0.017	-0.016
	(1.39)	(2.05)*	(2.56)*	(2.47)*	(3.18)**
Head of household==yes	-0.005	0.009	0.016	0.002	0.014
	(0.39)	(0.82)	(2.30)*	(0.24)	(2.41)*
Education	-0.003	-0.003	-0.005	-0.003	-0.005
	(2.44)*	(3.10)**	(7.60)**	(3.93)**	(8.29)**
Age	-0.001	0.000	0.001	0.000	0.000
	(2.36)*	(0.38)	(3.94)**	(1.91)	(3.25)**
Observations	13315	13671	41015	26986	54686

Robust z statistics in parentheses
* significant at 5%; ** significant at 1%
(*) See appendix 2.10 for details.

For the physical introduction of the Euro in 2002 (tables 2.13 and 2.14) we observe a significant drop in the probability of being against the Euro during the introductory period with respect to before (around 8 percentage points). The expected reversion in this support after the event, even though statistically significant, is low at around 4 percentage

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points, meaning that people seem to be not as disillusioned as they were after the non-physical introduction.

Table 2.13: Reduced forms, interaction effect (5) physical Euro intro 2002a (*).

Period Explanatory variables	'before'	'during'	'after'	'before/during interaction'	after/during interaction'
Big event==during				-0.079	-0.021
				(6.89)**	(2.04)*
Demand side of the formation of beliefs: X_D					
Political discussion=yes	-0.036	-0.038	-0.047	-0.031	-0.047
	(5.29)**	(5.19)**	(7.60)**	(4.88)**	(7.84)**
Persuade Friends=yes	-0.027	-0.02	-0.011	-0.025	-0.005
	(4.44)**	(3.15)**	(2.19)*	(4.43)**	(1.04)
Supply side of the formation of beliefs: X_S					
Knowledge EU (policy, institutions)	-0.078	-0.071	-0.048	-0.073	-0.05
	(12.14)**	(10.27)**	(8.52)**	(12.04)**	(8.92)**
Trust in National and International Institutions					
European Parliament==tend to trust	-0.079	-0.075	-0.094	-0.078	-0.087
	(6.50)**	(5.75)**	(8.91)**	(6.74)**	(8.40)**
European Parliament==tend not to trust	0.092	0.059	0.065	0.086	0.07
	(6.49)**	(3.78)**	(5.14)**	(6.38)**	(5.60)**
European Comision==tend to trust	-0.08	-0.064	-0.068	-0.077	-0.071
	(6.85)**	(5.19)**	(6.84)**	(6.97)**	(7.31)**
European Comision==tend not to trust	0.036	0.065	0.042	0.036	0.035
	(2.72)**	(4.41)**	(3.52)**	(2.90)**	(2.98)**
European Central Bank==tend to trust	-0.108	-0.073	-0.093	-0.098	-0.095
	(12.27)**	(7.56)**	(12.35)**	(11.85)**	(12.81)**
European Central Bank==tend not to trust	0.081	0.081	0.084	0.078	0.081
	(7.84)**	(6.87)**	(9.02)**	(7.98)**	(8.84)**
Interaction terms					
poldis*during				-0.009	0.011
				(0.99)	(1.23)
persuade*during				0.005	-0.025
				(0.60)	(3.19)**
knowledge*during				0.001	-0.017
				(0.08)	(2.02)*
trust european parliament*during				0.007	0.008
				(0.41)	(0.48)
not to trust european parliament*during				-0.028	-0.019
				(1.27)	(0.91)
trust european comission*during				0.018	0.015
				(1.09)	(0.96)
not to trust european comission*during				0.027	0.004
				(1.32)	(2.01)
trust ECB*during				0.02	0.028
				(1.60)	(2.42)*
not to trust ECB*during				-0.001	0.002
				(0.08)	(0.14)
Idiosincratic characteristics: X					
Country fix effects	yes	yes	yes	yes	yes
	(a)**	(a)**	(a)**	(a)**	(a)**
Gender==male	-0.078	-0.069	-0.06	-0.075	-0.064
	(12.35)**	(10.49)**	(11.12)**	(16.19)**	(15.24)**
Marital status==with couple	-0.017	-0.012	-0.024	-0.015	-0.02
	(2.78)**	(1.92)	(4.55)**	(3.40)**	(4.82)**
Head of household==yes	0.011	-0.002	0.009	0.006	0.005
	(1.59)	(0.27)	(1.47)	(1.15)	(0.99)
Education	-0.008	-0.008	-0.008	-0.008	-0.008
	(12.45)**	(9.85)**	(13.80)**	(15.99)**	(16.61)**
Age	0.001	0.001	0.001	0.001	0.001
	(6.33)**	(5.30)**	(7.24)**	(8.24)**	(8.93)**
Observations	41848	28046	43302	69894	71348

Robust z statistics in parentheses
* significant at 5%; ** significant at 1%
(*) See appendix 2.11 for details.

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Table 2.14: Reduced forms, interaction effect (5) physical euro intro 2002b (*).

Period Explanatory variables	'before'	'during'	'after'	'before/during interaction'	after/during interaction'
Big event==during				-0.083	-0.047
				(2.76)**	(1.71)
Demand side of the formation of beliefs: X_D					
Political discussion=yes	-0.035	-0.017	-0.022	-0.025	-0.026
	(2.49)*	(2.08)*	(1.77)	(2.05)*	(2.29)*
Persuade Friends=yes	-0.022	-0.009	0.007	-0.021	0.018
	(1.85)	(1.30)	(0.64)	(2.05)*	(1.83)
Identity pro european	-0.26	-0.217	-0.197	-0.233	-0.182
	(22.15)**	(30.60)**	(18.42)**	(22.51)**	(18.58)**
National Pride	0.013	-0.014	-0.003	0.008	0.005
	(0.72)	(1.23)	(0.14)	(0.53)	(0.33)
Life satisfaction	-0.033	-0.09	-0.084	-0.032	-0.1
	(1.99)*	(9.03)**	(6.15)**	(2.24)*	(7.81)**
Supply side of the formation of beliefs: X_S					
Knowledge EU (policy, institutions)	-0.046	-0.04	-0.032	-0.041	-0.029
	(3.48)**	(5.20)**	(2.78)**	(3.50)**	(2.73)**
Trust in National and International Institutions					
European Parliament==tend to trust	-0.044	-0.074	-0.07	-0.04	-0.046
	(1.70)	(4.84)**	(3.18)**	(1.74)	(2.26)*
European Parliament==tend not to trust	0.11	0.042	0.092	0.098	0.104
	(3.80)**	(2.35)*	(3.63)**	(3.79)**	(4.32)**
European Comision==tend to trust	-0.082	-0.044	-0.072	-0.078	-0.077
	(3.49)**	(3.09)**	(3.55)**	(3.76)**	(4.05)**
European Comision==tend not to trust	0.022	0.055	0.04	0.016	0.013
	(0.87)	(3.34)**	(1.72)	(0.69)	(0.62)
European Central Bank==tend to trust	-0.086	-0.06	-0.098	-0.071	-0.1
	(4.60)**	(5.35)**	(6.25)**	(4.27)**	(6.90)**
European Central Bank==tend not to trust	0.048	0.078	0.072	0.048	0.059
	(2.28)*	(5.86)**	(3.92)**	(2.52)*	(3.48)**
Press==tend to trust	0.001	-0.022	-0.015	-0.001	-0.015
	(0.06)	(2.52)*	(1.20)	(0.10)	(1.29)
Radio==tend to trust	-0.037	0.016	0.01	-0.032	0.004
	(1.89)	(1.52)	(0.63)	(1.83)	(0.31)
TV==tend to trust	0.036	0.026	0.017	0.035	0.002
	(1.95)	(2.65)**	(1.22)	(2.17)*	(0.14)
Political parties==tend to trust	-0.082	-0.041	-0.033	-0.071	-0.032
	(5.65)**	(5.02)**	(2.54)*	(5.67)**	(2.71)**
Interaction terms					
poldis*during				0.008	0.011
				(0.54)	(0.79)
persuade*during				0.015	-0.034
				(1.14)	(2.83)**
identity*during				0.035	-0.023
				(2.6)**	(1.85)
pride*during				-0.019	-0.024
				(0.94)	(1.24)
satisfaction*during				-0.055	0.026
				(3.00)**	(1.58)
knowledge*during				0.004	-0.009
				(0.27)	(0.68)
trust european parliament*during				-0.030	-0.030
				(1.01)	(1.15)
not to trust european parliament*during				-0.065	-0.071
				(1.90)	(2.24)*
trust european comission*during				0.044	0.042
				(1.64)	(1.74)
not to trust european comission*during				0.040	0.051
				(1.27)	(1.76)
trust ECB*during				0.014	0.050
				(0.67)	(2.71)**
not to trust ECB*during				0.024	0.019
				(0.93)	(0.84)
trust press*during				-0.020	-0.003
				(1.21)	(0.22)
trust radio*during				0.052	0.012
				(2.31)**	(0.67)
trust TV*duirng				-0.012	0.034
				(0.59)	(2.01)*
trust political parties*during				0.038	-0.009
				(2.41)**	(0.62)
Observations	11250	22774	11582	34024	34356

Robust z statistics in parentheses

* significant at 5%; ** significant at 1%

(*) The estimated marginal effect for the idiosyncratic characteristic are not showed for better edition. See appendix 2.12 for details.

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The interaction marginal effects for the 2002 introduction are not significantly different from zero in most cases in the sample *before-during*. When demand side variables (*European identity* and *life satisfaction*) and supply side of formation of beliefs (trust in national institutions: trust TV, radio, newspapers, political parties) are included (table 2.14) we observe that the interactions of *identity*, *trust-radio* and *trust-political-parties* with the *big event* are more relevant in decreasing the probability of being against the Euro before the introduction of the single currency (4, 5 and 4 percentage points more negative, respectively). Once the Euro is in place, most probably all the influence of "feeling European" and the information pro-Euro loses importance given the practical problems associated with the physical introduction. In the case of *life satisfaction*, the marginal effect before the introduction of the single currency in decreasing the probability of being against the Euro is 6 percentage points smaller than during the big event, consistent with self-serving beliefs in the neighborhood of the implementation.

In the case of the sample *after-during* for the 2002 introduction of the single currency, the marginal effect of the interaction of *persuade friends* and *knowledge* with *the big event* is negative, meaning that the importance of reducing the probability of being against the Euro is smaller after the big event (3 and 2 percentage points smaller, respectively). The latter is consistent with the already observed *before-during* reduction in the information coming from European institutions to convince people about the benefits of the Euro. This decreasing influence seems to be even less important after the big event: when the policy was already in place, the need to get citizens' support was no longer a priority. The marginal effect of the interaction between *trust-ECB* and the big event is positive and equal to 0.028 in table 2.13 and 0.05 in table 2.14, i.e. 3 percentage points and 5 percentage points more important in reducing the probability of being against the single currency after the big event. The relevance of the ECB is indeed crucial after the physical introduction of the Euro. It is logical to think then that the more the ECB is trusted, the more individuals support the Euro. For the reduced form in table 2.14, the interaction of not-to-trust European Parliament with the big event also becomes significant: *not to trust the European Parliament* has a positive effect on the probability of being against the Euro and this effect is 7 percentage points higher after the big event. The role of European institutions after the physical introduction of the Euro indeed became more relevant to support the Euro. Finally, *trust TV* increases the probability of being against the Euro and

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this effect decreases after the physical introduction of the Euro. Again, the latter could be an indication of the reduction of "propaganda" used to get support for the single currency policy after the implementation of the Euro.

To summarize, in this section the main hypothesis of this chapter has been tested.

First, the influence on beliefs about the introduction of the Euro is indeed sensitive to variables coming from both the demand and supply sides of the formation of beliefs. The demand side of the formation of beliefs shows that: political discussion, persuade friends, optimistic expectations for the next year, pro-European identity and being satisfied with your life decrease the probability of being against the Euro. In the case of the supply side of formation of beliefs, we observe the following: to have knowledge about European institutions, to frequently access media (TV, radio and newspapers) and to trust national and European institutions decrease the probability of being against the introduction of the single currency.

Second, there is evidence of an improvement in Euro support in the neighborhood of the introduction of the single currency that declines once the policy was in place. After the non-physical introduction of the Euro in 1999, the probability of being against the Euro increased 8 percentage points. There is no evidence of a pre-jump down through more optimistic beliefs. A possible explanation is people started realizing the implementation of the policy very slowly and, when the policy was in place, the boosting through pessimistic beliefs was observed. In the case of the physical introduction in 2002, the probability of being against the Euro decreased by 10 percentage points during the implementation and increased by 2-5 percentage points right after it.

With respect to the change in the supply and demand influences, there is evidence of more intense self-serving beliefs in the neighborhood of the implementation dates with respect to the period before. This is reflected in the higher impact of variables like optimistic expectations for the next year, higher degrees of life satisfaction and active political discussion. When we look at the effects after the implementation of the policy, the main result is the reduction of the relevance of knowing about European institutions after the physical introduction of the Euro in 2002, consistent with the intuition of less adoption

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information coming from European and national institutions. It is also interesting the increased relevance of trusting the European Central Bank and European Parliament in reducing the probability of being against the Euro after the introduction in 2002. The last could explain why the beliefs after the introduction of the Euro were not as pessimistic as before. The efforts to maintain stability of the Euro could be what matters more in getting citizens to support the single currency.

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2.5. Conclusions

The main hypothesis in this chapter refers to a boosting in beliefs when individuals face exogenous big events. There are evident jumps in beliefs during the relevant dates for the introduction of the Euro. The challenge was to propose a mechanism for beliefs formation, to disentangle the effects and to test their relevance on the probability of being against the Euro. Further, to measure the magnitude of the boosting in beliefs pre and post implementation dates.

To understand the dynamic of beliefs we identify two channels relevant for beliefs formation: the demand side of the formation of beliefs (consumers or citizens who form beliefs that trigger actions) and a supply side (actors who could benefit from consumers' decisions). The key characteristic of the model is that consumers are subjected the influence of interested actors. Individuals also update their beliefs with the arrival of new information sets. Boosting in beliefs in the presence of *big events* under this framework is the result of the interaction between (a) individuals that have preferences for self-serving beliefs (getting direct benefits from believing and convincing others) and that face imperfect recall (constrains to remember the past and/or to correct errors), and (b) actors such that friends, politicians and media that net benefits from manipulating individuals beliefs and when the *big event* or policy is already in place, revert back to the norm (given a cost of manipulation). Therefore, all the optimism gathered by the individuals could suddenly jump down when the information set is updated and the influences are gone.

Variables for the demand and supply sides of the formation of beliefs were selected and harmonized over time given the data available. The empirical strategy makes it possible to test their relevance (magnitude, sign and significance) and also to measure the correct pre and post boosting in beliefs.

The main results can be divided into three parts. First, the influence on beliefs about the introduction of the Euro is indeed sensitive to variables coming from both demand and supply sides of the formation of beliefs. Second, an improvement and posterior boosting in beliefs effectively occurred when the single currency was introduced in the Euro zone. The

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dynamic is more explicit after the non-physical introduction of the Euro (the probability of being against the Euro increases 10 percentage points with respect to the implementation date) and before the 2002 physical introduction (the probability of being against the single currency was 8 percentage points higher before the implementation date). Finally, with respect to the change in the supply and demand influences on beliefs before the big events, there is a tendency to sustain more self-serving beliefs in the neighborhood of the implementation dates. After the implementation of the policy, the main result shows a reduction of the relevance of knowing about European institutions after the physical introduction of the Euro in 2002, consistent with less adoption information coming from European and national institutions. Results also interestingly demonstrate the increased role of European institutions in reducing the probability of being against the Euro after the introduction in 2002. The latter could explain why beliefs after the introduction of the Euro were not as pessimistic as before. The effort to maintain the credibility of the Euro could be what matters more nowadays in getting citizens' support for the single currency.

The results here show the relative importance of internal and external sources for the formation of beliefs. In terms of policy implications, analysis of this kind could bring important insights about more effective information strategies for specific policy implementation within the European Union. In the case of this study, it seems that the most important forces positively correlated to Euro support are the European identity of individuals and the credibility of European Institutions. Especially given the recent circumstances caused by the financial crisis and the weaknesses of the Euro after the Greek debt crisis, it would be relevant to reinforce these two sources. Most of the efforts, from my point of view, have been focused on the credibility of European institutions. However, pro-European individuals' preferences have weakened since the crisis, threatening the support for the Euro. Strategies to enhance this feeling among European citizens would be indeed quite effective in the long-run.

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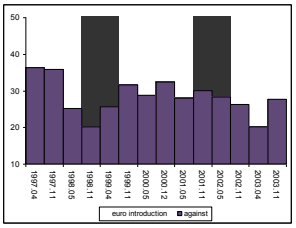
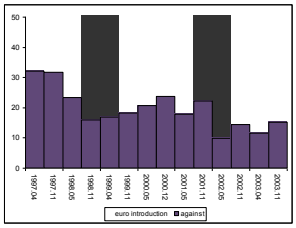
Appendix 2.1: Attitude towards the Common European Currency by country

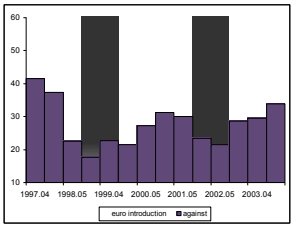
France



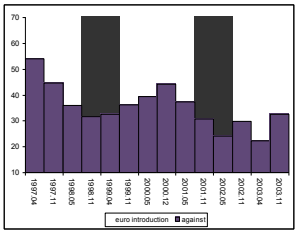
Belgium



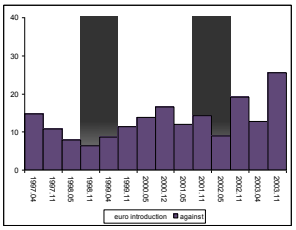
Holland



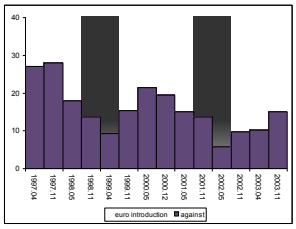
Germany



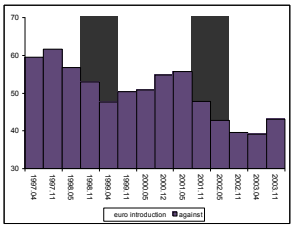
Italy



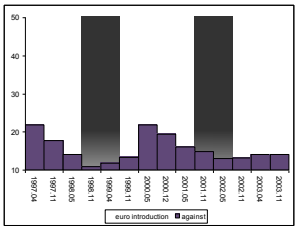
Luxembourg



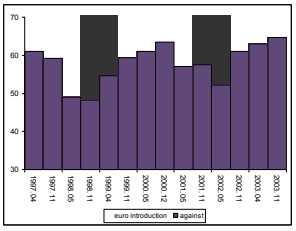
Denmark



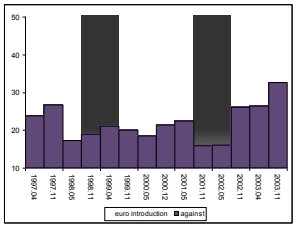
Ireland



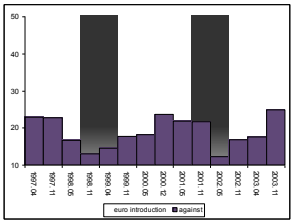
United Kingdom



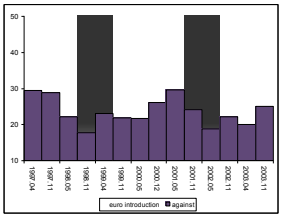
Greece



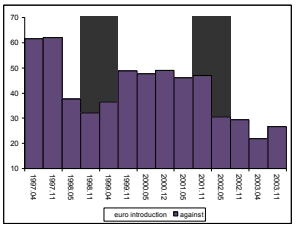
Spain



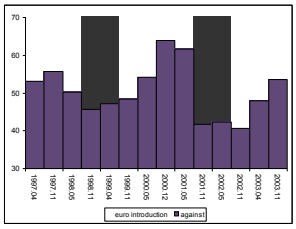
Portugal



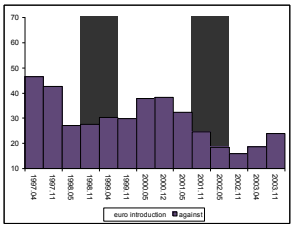
Finland



Sweden



Austria



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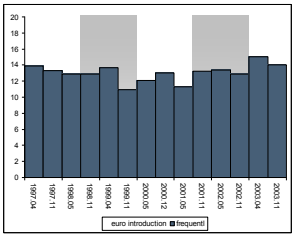
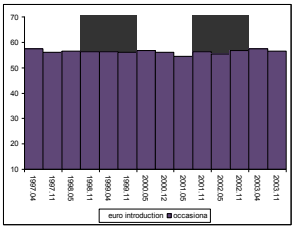
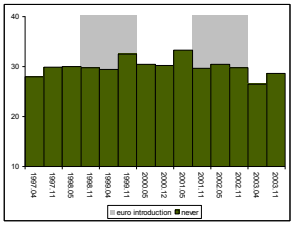
Appendix 2.2: Relevant variables, trend over time

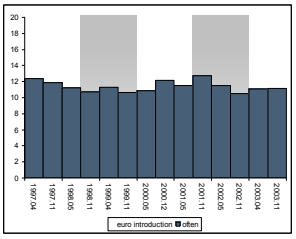
poldis

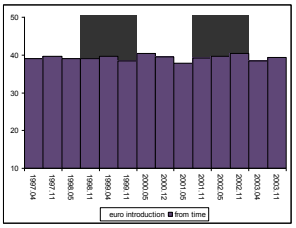


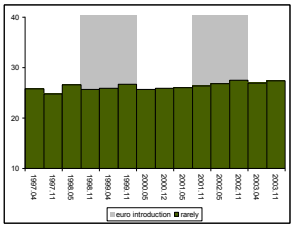


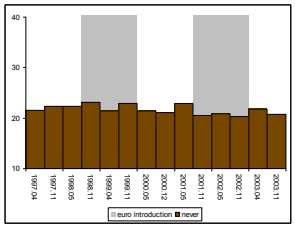


persuade

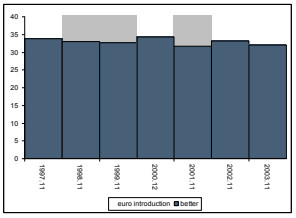


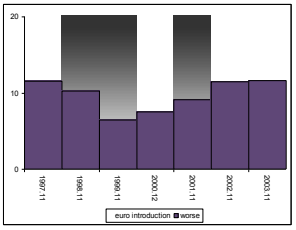


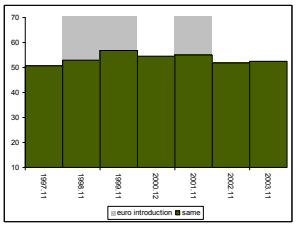




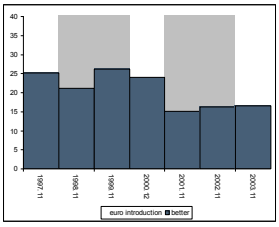
explife

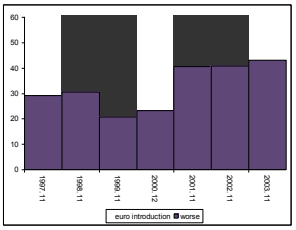


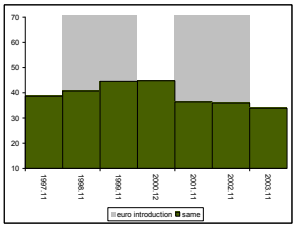




expeco







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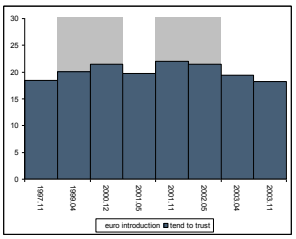
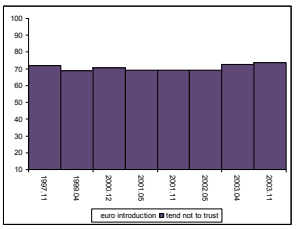
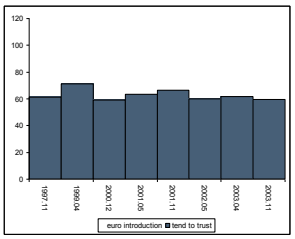
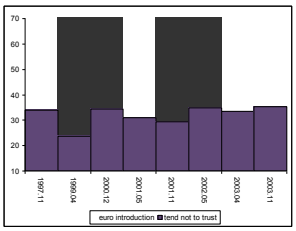
trustpol



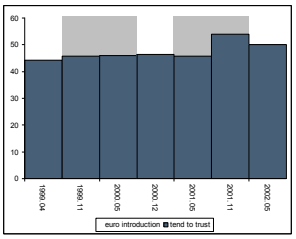


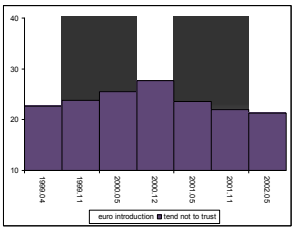
trsuttv

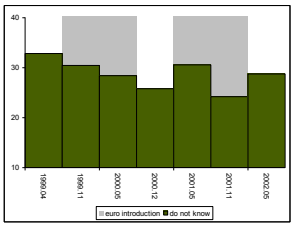




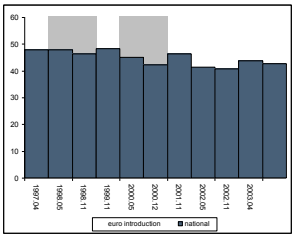
trustecb

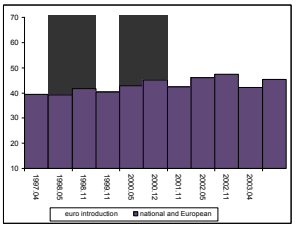


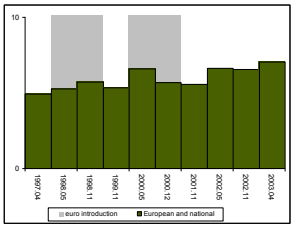


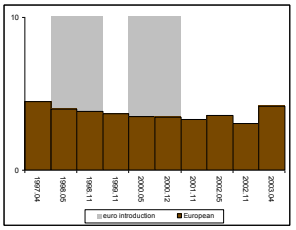


identity

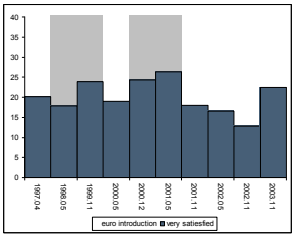


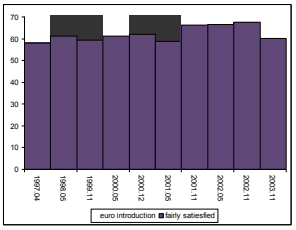


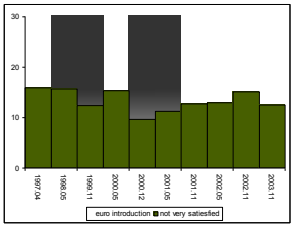


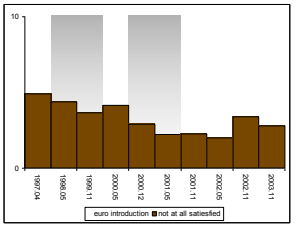


satis









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Appendix 2.3: Data Homologation process

This appendix gives detailed information about the data homologation process. First, the relevant data sets for the period under study are described. Then, the information is organized by question and specifies the new name of the homologated variable (in brackets), the availability over time and the exact variable number in each survey. The starting point for the compilation was the work done by Meinhard Moschner from GESIS (http://www.gesis.org/en/eurobarometer/data-access/).

Sample of relevant surveys

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year
2936	47.1	3-4	1997
2959	48	10-11	1997
3052	49	4-5	1998
3085	50.0	10-11	1998
3171	51.0	3-4	1999
3204	52.0	10-11	1999
3296	53	4-5	2000
3387	54.1	11-12	2000
3507	55.1	4-5	2001
3627	56.2	10-11	2001
3639	57.1	3-5	2002
3693	58.1	10-11	2002
3904	59.1	3-4	2003
3938	60.1	10-11	2003

Generation of important variables

gen eb="eb49"	Name of the respective survey
gen za=3052	Number of the respective ZA file
gen date=1998.5	Date, using the last month of the respective survey as reference

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Name of the country (united Germany and UK) (country)

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name
2936	47.1	3-4	1997		V13
2959	48	10-11	1997		V13
3052	49	4-5	1998		V13
3085	50.0	10-11	1998		V13
3171	51.0	3-4	1999		V13
3204	52.0	10-11	1999		V13
3296	53	4-5	2000		V13
3387	54.1	11-12	2000		V13
3507	55.1	4-5	2001		V12
3627	56.2	10-11	2001		V12
3639	57.1	3-5	2002		V12
3693	58.1	10-11	2002		V12
3904	59.1	3-4	2003		pais (generated in program)
3938	60.1	10-11	2003		V12

Weights (united Germany and UK) (fe)

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name
2936	47.1	3-4	1997		V14
2959	48	10-11	1997		V14
3052	49	4-5	1998		V14
3085	50.0	10-11	1998		V14
3171	51.0	3-4	1999		V14
3204	52.0	10-11	1999		V14
3296	53	4-5	2000		V14
3387	54.1	11-12	2000		V14
3507	55.1	4-5	2001		V13
3627	56.2	10-11	2001		V13
3639	57.1	3-5	2002		V13
3693	58.1	10-11	2002		V13
3904	59.1	3-4	2003		W14
3938	60.1	10-11	2003		V13

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Political Discussion (poldis)

When you get together with friends, would you say you discuss political matters frequently, occasionally, or never?

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	Q2	V37
2959	48	10-11	1997	Q2	V37
3052	49	4-5	1998	Q.2	V39
3085	50.0	10-11	1998	Q.3	V73
3171	51.0	3-4	1999	Q.2	V38
3204	52.0	10-11	1999	Q.5	V79
3296	53	4-5	2000	Q.2	V38
3387	54.1	11-12	2000	Q.2	V39
3507	55.1	4-5	2001	Q.5	V69
3627	56.2	10-11	2001	Q.2	V38
3639	57.1	3-5	2002	Q.2	V38
3693	58.1	10-11	2002	Q.2	V38
3904	59.1	3-4	2003	Q.2	q2
3938	60.1	10-11	2003	Q.2	V36

(1) Please notice, that the variable names refer to the final ICPSR/ZA codebook editions, if available.

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Persuade Friends (persuade)

When you hold a strong opinion, do you ever find yourself persuading your friends, relatives, or fellow workers to share your views? If so, does this happen ... often, from time to time, rarely, never?

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	Q3	V38
2959	48	10-11	1997	Q3	V38
3052	49	4-5	1998	Q.3	V40
3085	50.0	10-11	1998	Q.4	V74
3171	51.0	3-4	1999	Q.3	V39
3204	52.0	10-11	1999	Q.6	V80
3296	53	4-5	2000	Q.3	V39
3387	54.1	11-12	2000	Q.3	V40
3507	55.1	4-5	2001	Q.6	V70
3627	56.2	10-11	2001	Q.3	V39
3639	57.1	3-5	2002	Q.3	V39
3693	58.1	10-11	2002	Q.3	V39
3904	59.1	3-4	2003	Q.3	q3
3938	60.1	10-11	2003	Q.3	V37

(1) Please notice, that the variable names refer to the final ICPSR/ZA codebook editions, if available.

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Life Satisfaction (satis)

On the whole, are you very satisfied, fairly satisfied, not very satisfied, or not at all satisfied with the life you lead?

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	Q36	V247
2959	48	10-11	1997		
3052	49	4-5	1998	Q.5	V42
3204	52.0	10-11	1999	Q.7	V81
3205	52.1	11-12	1999	Q.13_1 (6)	
3296	53	4-5	2000	Q.4 (5)	V40
3387	54.1	11-12	2000	Q.4	V41
3507	55.1	4-5	2001	Q.7 (5)	V71
3626	56.1	9-10	2001	Q.46 (9)	
3627	56.2	10-11	2001	Q.4	V40
3639	57.1	3-5	2002	Q.4	V40
3640	57.2	4-6	2002	Q.4_1 (6)	V40
3938	60.1	10-11	2003	Q.4	V38

(1) Please notice, that the variable names refer to the final ICPSR/ZA codebook editions, if available.
(5) Follow up questions:

"If you compare your present situation with five years ago, would you say it has improved, stayed about the same or got worse?" and "in the course of the next five years, do you expect your personal situation to improve, to stay about the same or to get worse?"
(6) Different answer scale and additional items: Please tell me whether you are very satisfied, fairly satisfied, **neither satisfied nor dissatisfied**, not very satisfied or not at all satisfied with each of the following? 1. Your Life in general; 2. ...
(9) Modified question/item wording and additional items: Would you say you are satisfied, fairly satisfied, not very satisfied or not at all satisfied with the following things? 1. With the life you lead; 2. ... Please notice, that Eurobarometer 44.3OVR includes an UNEMPLOYED OVeRsample.

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Expectations for the next Year (exp*)

Eurobarometer 44 ff. (1995-):
What are your expectations for the year to come (the next twelve months): will (...) be better, worse or the same, when it comes to ... ?
... your life in general explife
... the economic situation in (our country) expeco
... the financial situation of your household expfin
... the employment situation in (our country) expunemp *notice the wording, in za3085 the question is about UNEMPLOYMENT*
... your personal job situation expjob
better
worse
same

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997		
2959	48	10-11	1997	Q4a-e	V39-v43
3085	50.0	10-11	1998	Q.5a-e	V75-V79
3204	52.0	10-11	1999	Q.8a-e	V82-v86
3205	52.1	11-12	1999	Q.14b_1 (2)	
3387	54.1	11-12	2000	Q.5a-e	V42-v46
3507	55.1	11-12	2000	Q.9 (personal situation, five years)	V73
3627	56.2	10-11	2001	Q.5a-e	V41-v45
3639	57.1	3-5	2002	Q.6 (personal situation, five years)	V42
3640	57.2	4-6	2002	Q.5_1 (2)	
3693	58.1	10-11	2002	Q.5	V41-v45
3938	60.1	10-11	2003	Q.5	V39-v43

(1) Please notice, that the variable names refer to the final ICPSR/ZA codebook editions, if available.
(2) **Different question wording and context:** And, in two years time, do you think you will be more satisfied, less satisfied or as satisfied as you are today with ...? 1. Your life in general

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Trust in National and International Institutions (trust*)

Eurobarometer 48 ff.:
I would like to ask you a question about how much trust you have in certain institutions. For each of the following institutions, please tell me if you tend to trust it or tend not to trust it.

The press trustpress
The Radio trustradio
Television trusttv
The Justice (the (national) legal) system
The police
The army
The church (56.2 ff.: The religious institutions)
Trade unions
Political parties trustpol
The Civil service (not in 60.1 and later)
Big companies (not in 66.1)
The (national) government (not in 54.1) trustgov
The national Parliament (use proper name)
The European Union (not in 54.1) trusteu
The United Nations
Non-Governmental Organizations (or NGOs) (not in 59.1 and later)
Charitable (51 ff.: or voluntary) **organizations** (not in 66.1)
The educational system (only 54.1 and 57.1)
Consumer Associations (66.1 NEW)
The Council of your city/village (only 66.3)

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997		
2959	48	10-11	1997	Q6a-q	V46-v48, v54,v57,v59
2936	47.1	3-4	1997		
2959	48	10-11	1997	Q4a-e	V39-v43
3086	50.1	11-12	1998	Q.59a-d(5)	
3171	51.0	3-4	1999	Q.6a-q	v44-46, v52, v55, v57
3387	54.1	11-12	2000	Q.59	V316-v318, v319
3507	55.1	4-5	2001	Q.10	V74-v76, v82,v85,v87
3627	56.2	10-11	2001	Q.34	V176-v178, v184,v187,v189
3639	57.1	3-5	2002	Q.8	V53-v55, v61,v64,v66
3904	59.1	3-4	2003	Q.4	Q401-q403, q409,q411,q413
3938	60.1	10-11	2003	Q.6	V44-v46, v52, v54, v56

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Attitudes towards the membership in the European Community (European Union) (good thing, bad thing…) (membership)

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	Q15	V116
2959	48	10-11	1997	Q13	V99
3052	49	4-5	1998	Q.15	V121
3085	50.0	10-11	1998	Q.14	V130
3171	51.0	3-4	1999	Q.10	V104
3204	52.0	10-11	1999	Q.20	v465
3296	53	4-5	2000	Q.12	V55
3387	54.1	11-12	2000	Q.17	V94
3507	55.1	4-5	2001	Q17	V146
3627	56.2	10-11	2001	Q.18	V93
3639	57.1	3-5	2002	Q.13	V112
3693	58.1	10-11	2002	Q.12	V92
3904	59.1	3-4	2003	Q.9	q9
3938	60.1	10-11	2003	Q.7	V59

The feeling that one's country has benefited from being a member of the European Community (European Union) (benefit)

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	Q16	V117
2959	48	10-11	1997	Q14	V100
3052	49	4-5	1998	Q.16	V122
3085	50.0	10-11	1998	Q.15	V131
3171	51.0	3-4	1999	Q.11	V105
3204	52.0	10-11	1999	Q.21	V466
3296	53	4-5	2000	Q.13	V56
3387	54.1	11-12	2000	Q.18	V95
3507	55.1	4-5	2001	Q18	V147
3627	56.2	10-11	2001	Q.19	V94
3639	57.1	3-5	2002	Q.14	V113
3693	58.1	10-11	2002	Q.13	V93
3904	59.1	3-4	2003	Q.10	q10
3938	60.1	10-11	2003	Q.8	V60

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Using this scale (1 know nothing to 10 a great deal), how much do you feel you know about the European Union, its policies, its institutions? (knowledge)

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997		
2959	48	10-11	1997	Q7	V63
3052	49	4-5	1998	Q.7	V45
3085	50.0	10-11	1998	Q.6	V80
3171	51.0	3-4	1999	Q.4	V40
3204	52.0	10-11	1999	Q.17	V433
3296	53	4-5	2000	Q.9	V50
3387	54.1	11-12	2000	Q.14	V62
3507	55.1	4-5	2001	Q.15	V133
3627	56.2	10-11	2001	Q.14	V58
3639	57.1	3-5	2002	Q.10	V78
3693	58.1	10-11	2002	Q.9	V58
3904	59.1	3-4	2003	Q.7	q7
3938	60.1	10-11	2003	Q.15	V89

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Trust in European Institutions (trust*)

Eurobarometer 51.0 ff.

Follow-up question to 'awareness' and 'perceived importance' of these institutions:
Have you ever heard of (European Institutions)? ... and for each of them, please tell me if you tend to trust it or tend not to trust it.

The national Parliament (only up to 45)
The (national) government (only up to 45)
The European Parliament **trustep**
The European Commission **trustec**
The Council of Ministers of the European Union
The European Court of Justice (41.1, 51 ff.)
The European Ombudsman (51 ff.)
The European Central Bank (51 ff.) **trustecb**
The European Court of Auditors (51 ff)
The Committee of the Regions of the European Union (51 ff.)
The Social and Economic Committee of the European Union (51 ff.)
The Convention on the future of the European Union (57.1 to 59.1)

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997		
2959	48	10-11	1997		
3171	51.0	3-4	1999	Q.16c	V132,v133,v137
3204	52.0	10-11	1999	Q.28 (4)	V489,v490,v494
3296	53	3-4	2000	Q.27	V140,v141,v145
3387	54.1	11-12	2000	Q.26	V119,v120,v124
3507	55.1	4-5	2001	Q.24	v169,v170,v174
3627	56.2	10-11	2001	Q.26	v117,v118,v122
3639	57.1	3-5	2002	Q.21	V152,v153,v157
3693	58.1	10-11	2002	Q.21	V121,v122,v126
3904	59.1	3-4	2003	Q.17	q1701,q1702,q1706
3938	60.1	10-11	2003	Q.22	V143,v144,v148

(1) Please notice that the variable names refer to the final ICPSR/ZA codebook editions, if available.
(4) Followed by the additional question: And, for each of them, please tell me if you are tending to put more trust or tending to put less trust in?

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Attitude towards the Common European Currency (euro)

Is the respondent 'for' or 'against' a common European currency (single currency) replacing the national currencies in all EC / EU member states
Please see notes for exact question wording.

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	Q22_1(10)	V151
2959	48	10-11	1997	Q25_1(10)	V188
3052	49	4-5	1998	Q.25_1 (10)	V157
3085	50.0	10-11	1998	Q.35_1 (10)	V204
3171	51.0	3-4	1999	Q.20_1 (10)	V169
3204	52.0	10-11	1999	Q.33_1 (10)	V510
3296	53	4-5	2000	Q.32_1 (10)	V153
3387	54.1	11-12	2000	Q.29_1 (10)	V130
3507	55.1	4-5	2001	Q.28_1 (10)	V181
3627	56.2	10-11	2001	Q.31_1 (10)	V155
3639	57.1	3-5	2002	Q.25_1 (10)	V191
3693	58.1	10-11	2002	Q26	V162
3903	59.0	1-2	2003	Q.2_1 A (10)	Q201a
3904	59.1	3-4	2003	Q.23_1 (10)	Q2301
3938	60.1	10-11	2003	Q.29_1 (10)	V214

(1) Please notice, that the variable names refer to the final ICPSR/ZA codebook editions, if available. Otherwise future changes of variable names (in parenthesis) are possible.
(10) (EB38.0/38.1/39.0: "Irrespective of other details of the Maastricht Treaty ...) "What is your opinion on each of the following proposals (statements)? Please tell me for each proposal, whether you are for it or against it: There should (EB49 ff.: has to) be (a European Monetary Union with) one single currency (the EURO) (replacing (by 1999) the (NATIONAL CURRENCY) and all other national currencies of the Member States of the European Community (European Union))."
(16) Different question wording and answer scale: "Are you for or against the European Union having one European currency in all member states, including (OUR COUNTRY) once we have joined? That is, replacing the (NAME OF NATIONAL CURRENCY) by the European currency, the Euro ? Are you... ? 4 - very much for; 3 - somewhat for; 2 - somewhat against; 1 - very much against
(17) "What is your opinion on each of the following statements? Please tell me for each statement whether you are for or against it. A European Monetary Union with one single currency, the EURO

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National Identity - European Identity (7) - World Identity (identity)

Eurobarometer 37 ff., CCEB:

In the near future do you see yourself as ... ?

(NATIONALITY) only
(NATIONALITY) and European
European and (NATIONALITY)
European only

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	Q19	V120
2959	48	10-11	1997		
3052	49	3-4	1998	Q.17	V123
3085	50.0	10-11	1998	Q.22	V140
3204	52.0	10-11	1999	Q.9	V87
3296	53	4-5	2000	Q.28	V149
3387	54.1	11-12	2000	Q.23 (3)	V100
3627	56.2	10-11	2001	Q.6 (3)	V46
3639	57.1	3-5	2002	Q.27 (3)	V213
3693	58.1	10-11	2002	Q.32	V214
3904	59.1	3-4	2003	Q.12	q12
3938	60.1	10-11	2003	Q.43	V448

(1) Please notice, that the variable names refer to the final ICPSR/ZA codebook editions, if available.
(3) In addition and starting with Eurobarometer 54 a new question is introduced asking if the respondent is "very proud, fairly proud, not very proud, or not at all proud to be European" (see "national pride").
(7) Another question on European Identity has been asked in the Flash-Eurobarometer series in the context of the EURO introduction: "Since using the EURO, do you personally feel a little more European Than before, a little less European than before or would you say that your feeling of being European has not changed?" (Flash Eurobarometer 139, 153, 165, 175, 193).

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National Pride (pride)

Would you say that you are very proud, quite proud, not very proud, or not at all proud to be (nationality (3))?
New follow up question added starting with Eurobarometer 54 / CCEB:
And would you say you are very proud, fairly proud, not very proud, not at all proud to be European?(4)

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	Q40	V254
2959	48	10-11	1997		
3204	52.0	10-11	1999	Q.10	V88
3296	53	4-5	2000	Q.29	V150
3387	54.1	11-12	2000	Q.6 / Q.7	V47
3627	56.2	10-11	2001	Q.7 / Q.8	V47
3639	57.1	3-5	2002	Q.28	V214
3938	60.1	10-11	2003	Q.44 / Q.45	V449

(1) Please notice, that the variable names refer to the final ICPSR/ZA codebook editions, if available.
(3) Starting with Eurobarometer 53 referring to the nationality as specified in Q.1 ("What is your nationality"?).
(4) "European pride" has been asked for the first time in the framework of Flash Eurobarometer 47: Q.3 "In fact, all citizens of the European Union member states are "European citizens". Are you personally proud or not to be a European citizen?".

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Media Use

1) News in television, papers and radio in general:
(About how often) do you ...

a) watch the news on television? (newstv)

Everyday
Several times a week
Once or twice a week
Less often
Never

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	Q5a	V41
2959	48	10-11	1997	Q10a	V92
3052	49	4-5	1998	Q.13a	V106
3085	50.0	10-11	1998	Q.7a	V81
3171	51.0	3-4	1999	Q.5a	V41
3204	52.0	10-11	1999	Q.13a	V91
3296	53	4-5	2000	Q.8a	V47
3387	54.1	11-12	2000	Q.11a	V55
3507	55.1	4-5	2001	Q.11a	V91
3627	56.2	10-11	2001	Q.11a	V51

b) ... read about current politics in daily (news)papers? (newspaper)

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	Q5b	V42
2959	48	10-11	1997	Q10b	V93
3052	49	4-5	1998	Q.13b	V107
3085	50.0	10-11	1998	Q.7b	V82
3171	51.0	3-4	1999	Q.5b	V42
3204	52.0	10-11	1999	Q.13b	V92
3296	53	4-5	2000	Q.8b	V48
3387	54.1	11-12	2000	Q.11b	V56
3507	55.1	4-5	2001	Q.11b	V92
3627	56.2	10-11	2001	Q.11b	V52

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c) ... listen to news broadcasts on the radio? (newsradio)

Everyday
Several times a week
Once or twice a week
Less often
Never

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	Q5c	V43
2959	48	10-11	1997	Q10c	V94
3052	49	4-5	1998	Q.13c	V108
3085	50.0	10-11	1998	Q.7c	V83
3171	51.0	3-4	1999	Q.5c	V43
3204	52.0	10-11	1999	Q.13c	V93
3296	53	4-5	2000	Q.8c	V49
3387	54.1	11-12	2000	Q.11c	V57
3507	55.1	4-5	2001	Q.11c	V93
3627	56.2	10-11	2001	Q.11c	V53

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DEMOGRAFICS

Political left 1 right 10 (pol)

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	D1	v440
2959	48	10-11	1997	D1	v962
3052	49	4-5	1998	D.1	v551
3085	50.0	10-11	1998	D.1	v360
3171	51.0	3-4	1999	D.1	v433
3204	52.0	10-11	1999	D.1	v780
3296	53	4-5	2000	D.1	v571
3387	54.1	11-12	2000	D.1	v327
3507	55.1	4-5	2001	D.1	v352
3627	56.2	10-11	2001	D.1	v385
3639	57.1	3-5	2002	D.1	v369
3693	58.1	10-11	2002	D.1	v413
3904	59.1	3-4	2003	D.1	d1r
3938	60.1	10-11	2003	D.1	v591

Marital status (marital)

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	D7	v444
2959	48	10-11	1997	D7	v966
3052	49	4-5	1998	D7	v571
3085	50.0	10-11	1998	D7	v363
3171	51.0	3-4	1999	D7	v453
3204	52.0	10-11	1999	D7	v800
3296	53	4-5	2000	D7	v591
3387	54.1	11-12	2000	D7	v347
3507	55.1	4-5	2001	D7	v355
3627	56.2	10-11	2001	D7	v388
3639	57.1	3-5	2002	D7	v372
3693	58.1	10-11	2002	D7	v416
3904	59.1	3-4	2003	D.7	d7
3938	60.1	10-11	2003	D.7	v594

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Age when finishing studies (agestudy)

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	D8	v445
2959	48	10-11	1997	D8	v967
3052	49	4-5	1998	D8	v572
3085	50.0	10-11	1998	D8	v364
3171	51.0	3-4	1999	D8	v454
3204	52.0	10-11	1999	D8	v801
3296	53	4-5	2000	D8	v592
3387	54.1	11-12	2000	D8	v348
3507	55.1	4-5	2001	D8	v356
3627	56.2	10-11	2001	D8	v389
3639	57.1	3-5	2002	D8	v373
3693	58.1	10-11	2002	D8	v417
3904	59.1	3-4	2003	D.8	d8
3938	60.1	10-11	2003	D.8	v595

Gender (gender)

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	D10	v447
2959	48	10-11	1997	D10	v969
3052	49	4-5	1998	D10	v574
3085	50.0	10-11	1998	D10	v366
3171	51.0	3-4	1999	D10	v456
3204	52.0	10-11	1999	D10	v803
3296	53	4-5	2000	D10	v594
3387	54.1	11-12	2000	D10	v350
3507	55.1	4-5	2001	D10	v358
3627	56.2	10-11	2001	D10	v391
3639	57.1	3-5	2002	D10	v375
3693	58.1	10-11	2002	D10	v419
3904	59.1	3-4	2003	D.10	d10
3938	60.1	10-11	2003	D.10	v597

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Age (age)

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	D11	v448
2959	48	10-11	1997	D11	v970
3052	49	4-5	1998	D11	v575
3085	50.0	10-11	1998	D11	v367
3171	51.0	3-4	1999	D11	v457
3204	52.0	10-11	1999	D11	v804
3296	53	4-5	2000	D11	v595
3387	54.1	11-12	2000	D11	v351
3507	55.1	4-5	2001	D11	v359
3627	56.2	10-11	2001	D11	NO
3639	57.1	3-5	2002	D11	v376
3693	58.1	10-11	2002	D11	v420
3904	59.1	3-4	2003	D.11	d11
3938	60.1	10-11	2003	D.11	v598

Occupation of the respondent (ocup)

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	D15a	v455
2959	48	10-11	1997	D15a	v975
3052	49	4-5	1998	D15a	v580
3085	50.0	10-11	1998	D15a	v372
3171	51.0	3-4	1999	D15a	v462
3204	52.0	10-11	1999	D15a	v809
3296	53	4-5	2000	D15a	v600
3387	54.1	11-12	2000	D15a	v356
3507	55.1	4-5	2001	D15a	v362
3627	56.2	10-11	2001	D15a	v393
3639	57.1	3-5	2002	D15a	v379
3693	58.1	10-11	2002	D15a	v423
3904	59.1	3-4	2003	D.15	d15ar
3938	60.1	10-11	2003	D.15	v601

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Head of household (head)

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	D19b	v459
2959	48	10-11	1997	D19b	v978
3052	49	4-5	1998	D19b	v583
3085	50.0	10-11	1998	D19b	v375
3171	51.0	3-4	1999	D19b	v465
3204	52.0	10-11	1999	D19b	v812
3296	53	4-5	2000	D19b	v603
3387	54.1	11-12	2000	D19b	v359
3507	55.1	4-5	2001	D19	v364
3627	56.2	10-11	2001	D19	v395
3639	57.1	3-5	2002	D19	v381
3693	58.1	10-11	2002	D19	v425
3904	59.1	3-4	2003	D.19	d19
3938	60.1	10-11	2003	D.19	v603

Occupation of head (ocuphead)

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	D21a	v460
2959	48	10-11	1997	D21a	v979
3052	49	4-5	1998	D21a	v584
3085	50.0	10-11	1998	D21a	v376
3171	51.0	3-4	1999	D21a	v466
3204	52.0	10-11	1999	D21a	v813
3296	53	4-5	2000	D21a	v604
3387	54.1	11-12	2000	D21a	v360
3507	55.1	4-5	2001	D21a	v365
3627	56.2	10-11	2001	D21a	v396
3639	57.1	3-5	2002	D21a	v382
3693	58.1	10-11	2002	D21a	v426
3904	59.1	3-4	2003	D.21	d21ar
3938	60.1	10-11	2003	D.21	v604

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Rural Urban area (rural)

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	D25	v462
2959	48	10-11	1997	NO	
3052	49	4-5	1998	NO	
3085	50.0	10-11	1998	D25	v378
3171	51.0	3-4	1999	NO	NO
3204	52.0	10-11	1999	NO	NO
3296	53	4-5	2000	NO	NO
3387	54.1	11-12	2000	NO	NO
3507	55.1	4-5	2001	NO	NO
3627	56.2	10-11	2001	D25	v398
3639	57.1	3-5	2002	D25	v384
3693	58.1	10-11	2002	D25	v428
3904	59.1	3-4	2003	D.25	d25
3938	60.1	10-11	2003	D.25	v606

Income, recoded by quartiles (income)

ZA Study Number	Eurobarometer	Fieldwork Month	Fieldwork Year	Question Number	Variable Name (1)
2936	47.1	3-4	1997	D29	v465
2959	48	10-11	1997	D29	v982
3052	49	4-5	1998	D29	v604
3085	50.0	10-11	1998	D29	v399
3171	51.0	3-4	1999	D29	v486
3204	52.0	10-11	1999	D29	v833
3296	53	4-5	2000	D29	v624
3387	54.1	11-12	2000	D29	v380
3507	55.1	4-5	2001	D29	v386
3627	56.2	10-11	2001	D29	v417
3639	57.1	3-5	2002	D29	v403
3693	58.1	10-11	2002	D29	v447
3904	59.1	3-4	2003	D.29	d29_c
3938	60.1	10-11	2003	D.29	v625

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Appendix 2.4: Summary statistics by country

Education (age when finishing studies), excludes people still studying

date		france	belgium	holand	germany	italy	luxembour	denmark	ireland	united ki	greece	spain	portugal	finland	sweden	austria	T
1997.04	mean	17.88	17.89	18.94	17.87	16.83	18.06	21.38	17.06	17.02	16.31	15.68	13.46	19.95	19.51	17.57	
	std.dev.	*3.47*	*3.31*	*4.45*	*4.00*	*4.88*	*3.51*	*5.19*	*2.84*	*3.20*	*4.60*	*4.47*	*5.15*	*5.50*	*5.49*	*3.27*	
1997.11	mean	18.05	18.11	18.55	17.73	16.73	17.92	21.41	16.68	16.96	16.10	15.65	13.43	19.83	19.89	17.51	
	std.dev.	*3.61*	*3.37*	*4.09*	*3.95*	*4.62*	*3.23*	*5.22*	*2.56*	*3.64*	*4.92*	*4.78*	*4.68*	*5.52*	*5.56*	*3.13*	
1998.05	mean	17.94	18.17	18.59	17.70	17.11	17.77	21.25	16.91	17.04	16.11	15.90	13.63	19.86	19.59	17.57	
	std.dev.	*3.57*	*3.35*	*4.47*	*3.96*	*4.92*	*3.54*	*4.87*	*2.83*	*3.74*	*4.58*	*4.70*	*4.72*	*5.43*	*5.33*	*3.02*	
1998.11	mean	17.84	18.25	18.66	17.71	16.78	18.10	21.50	17.19	16.81	16.26	15.74	13.27	20.22	19.94	17.56	
	std.dev.	*3.65*	*3.66*	*4.46*	*3.84*	*5.03*	*4.46*	*5.41*	*3.28*	*3.77*	*4.73*	*4.72*	*4.53*	*5.63*	*5.52*	*3.29*	
1999.04	mean	17.98	18.05	18.59	17.67	16.85	18.09	21.29	16.87	16.74	16.11	15.78	13.57	19.98	19.97	17.47	
	std.dev.	*3.40*	*3.20*	*4.15*	*3.81*	*4.96*	*3.48*	*5.35*	*2.44*	*3.25*	*4.79*	*4.61*	*4.84*	*5.47*	*5.63*	*3.21*	
1999.11	mean	17.76	18.26	18.44	17.65	17.12	18.45	21.51	16.80	16.31	16.19	15.96	13.47	19.99	20.26	17.34	
	std.dev.	*3.34*	*3.48*	*4.17*	*3.76*	*4.89*	*4.07*	*5.27*	*2.67*	*2.74*	*4.53*	*4.78*	*4.68*	*5.35*	*5.80*	*3.17*	
2000.05	mean	17.98	18.14	18.28	17.74	17.35	17.93	21.93	16.97	16.60	16.01	15.78	13.48	20.28	20.23	17.48	
	std.dev.	*3.37*	*3.17*	*4.10*	*4.10*	*5.00*	*3.42*	*5.32*	*2.45*	*2.80*	*4.36*	*4.66*	*4.82*	*5.50*	*5.93*	*3.21*	
2000.12	mean	17.96	18.14	19.21	17.86	17.20	18.19	21.81	17.00	16.70	16.67	15.92	13.65	20.02	20.56	17.41	
	std.dev.	*3.58*	*3.31*	*4.85*	*4.01*	*4.76*	*4.13*	*5.33*	*2.87*	*3.08*	*5.19*	*4.65*	*4.73*	*5.48*	*5.96*	*3.17*	
2001.05	mean	18.25	18.05	19.02	17.79	16.98	18.10	21.96	16.97	16.53	16.47	15.85	13.55	19.83	20.58	17.48	
	std.dev.	*3.45*	*3.12*	*4.56*	*3.88*	*4.63*	*3.92*	*5.46*	*2.71*	*2.45*	*4.97*	*4.46*	*4.74*	*5.20*	*5.79*	*3.17*	
2001.11	mean	18.41	18.27	18.66	17.72	16.90	19.01	22.18	17.29	16.66	16.94	15.97	13.91	20.21	20.68	17.41	
	std.dev.	*3.56*	*3.18*	*4.21*	*3.75*	*4.48*	*3.98*	*5.28*	*2.88*	*3.02*	*4.90*	*4.35*	*4.83*	*5.54*	*6.23*	*3.13*	
2002.05	mean	18.03	18.00	18.86	17.86	17.41	18.19	21.78	17.41	16.82	16.68	15.85	13.60	19.83	20.88	17.65	
	std.dev.	*3.24*	*3.10*	*4.06*	*3.96*	*4.86*	*3.97*	*5.43*	*2.58*	*3.04*	*4.77*	*4.45*	*4.42*	*5.18*	*6.49*	*3.32*	
2002.11	mean	18.06	17.93	18.69	17.81	17.07	18.36	21.54	17.59	16.75	16.40	16.05	13.70	19.57	20.48	17.47	
	std.dev.	*3.28*	*3.15*	*4.11*	*3.69*	*4.84*	*3.77*	*4.71*	*2.69*	*2.83*	*4.78*	*4.74*	*4.55*	*4.53*	*4.99*	*3.27*	
2003.04	mean	18.35	18.13	18.85	17.80	17.05	17.71	21.94	17.47	17.14	16.46	16.46	13.43	20.41	21.63	17.62	
	std.dev.	*3.89*	*3.20*	*3.99*	*3.64*	*5.02*	*4.72*	*5.82*	*2.94*	*3.83*	*4.82*	*4.83*	*4.41*	*5.10*	*6.38*	*3.32*	
2003.11	mean	18.50	18.34	18.96	17.67	17.23	18.13	22.22	17.44	17.09	17.09	16.19	13.39	19.90	21.64	17.34	
	std.dev.	*3.56*	*3.44*	*4.10*	*3.80*	*4.70*	*4.30*	*5.65*	*2.54*	*3.24*	*4.86*	*4.56*	*4.39*	*5.07*	*6.52*	*3.37*	
Total	mean	18.08	18.12	18.74	17.76	17.04	18.14	21.70	17.12	16.80	16.41	15.91	13.54	19.99	20.41	17.49	
	std.dev.	*3.51*	*3.29*	*4.28*	*3.87*	*4.83*	*3.92*	*5.32*	*2.76*	*3.22*	*4.78*	*4.63*	*4.68*	*5.33*	*5.87*	*3.22*	

Age (years)

date		france	belgium	holand	germany	italy	luxembour	denmark	ireland	united ki	greece	spain	portugal	finland	sweden	austria	T
1997.04	mean	42.96	44.41	42.60	44.64	43.96	43.36	44.11	41.59	43.83	43.72	42.67	43.46	44.29	45.69	43.73	
	std.dev.	*17.17*	*17.80*	*16.87*	*17.53*	*17.91*	*18.27*	*18.09*	*18.14*	*17.39*	*16.76*	*18.12*	*18.72*	*17.94*	*18.62*	*17.96*	
1997.11	mean	42.84	44.68	42.61	44.45	43.94	43.37	44.04	41.53	44.22	43.68	42.74	43.30	44.27	45.69	43.92	
	std.dev.	*17.31*	*18.37*	*17.56*	*17.55*	*17.99*	*18.15*	*17.98*	*18.34*	*17.90*	*17.34*	*18.02*	*18.64*	*17.87*	*18.33*	*18.28*	
1998.05	mean	43.25	44.65	43.26	44.90	44.02	43.45	43.63	41.41	43.95	43.84	42.76	43.66	44.13	45.71	43.78	
	std.dev.	*18.08*	*18.29*	*17.94*	*17.85*	*17.98*	*17.05*	*17.61*	*18.22*	*17.34*	*17.56*	*18.01*	*18.44*	*17.51*	*18.49*	*17.84*	
1998.11	mean	44.27	45.21	43.66	45.55	45.00	45.94	45.07	42.85	45.06	44.15	43.51	43.52	44.91	46.07	44.71	
	std.dev.	*18.34*	*18.47*	*17.55*	*17.78*	*18.26*	*18.57*	*18.12*	*19.00*	*18.79*	*17.78*	*18.63*	*18.35*	*18.06*	*18.60*	*18.59*	
1999.04	mean	44.19	45.29	44.06	45.53	45.09	45.81	45.23	43.09	44.99	44.37	43.48	43.55	45.13	45.53	44.68	
	std.dev.	*18.05*	*18.56*	*17.80*	*18.06*	*18.08*	*18.64*	*18.38*	*19.18*	*18.71*	*17.91*	*18.51*	*18.57*	*18.09*	*17.56*	*18.53*	
1999.11	mean	44.12	45.42	43.73	45.54	45.12	45.53	45.01	43.46	44.07	44.11	43.67	43.54	45.01	46.26	44.74	
	std.dev.	*18.05*	*18.68*	*17.58*	*17.94*	*18.04*	*18.01*	*18.23*	*19.41*	*19.09*	*17.54*	*18.28*	*18.42*	*17.84*	*18.77*	*18.36*	
2000.05	mean	43.95	45.23	43.84	45.68	44.68	45.71	44.93	42.96	45.08	44.31	43.57	43.52	44.96	46.31	44.76	
	std.dev.	*17.78*	*18.73*	*17.78*	*17.96*	*18.25*	*18.26*	*18.20*	*19.05*	*18.64*	*17.54*	*18.42*	*18.28*	*18.04*	*18.31*	*18.54*	
2000.12	mean	44.38	45.36	44.00	45.78	45.11	46.46	45.15	42.92	45.18	44.83	43.34	43.81	44.79	46.11	44.66	
	std.dev.	*18.53*	*18.66*	*17.45*	*18.08*	*18.38*	*19.33*	*18.39*	*18.90*	*18.64*	*18.30*	*18.22*	*18.59*	*17.88*	*17.91*	*17.99*	
2001.05	mean	44.06	45.22	44.02	45.79	44.86	45.34	45.13	43.13	44.91	44.50	43.58	43.92	45.05	46.11	44.27	
	std.dev.	*17.97*	*18.58*	*17.64*	*17.89*	*17.81*	*17.74*	*18.27*	*18.68*	*18.68*	*18.37*	*18.98*	*18.75*	*17.94*	*18.40*	*18.35*	
2001.11	mean	43.77	45.26	43.40	45.75	45.37	44.72	45.44	42.82	44.57	44.55	43.46	44.21	45.05	46.55	44.57	
	std.dev.	*18.04*	*18.80*	*17.62*	*18.07*	*18.25*	*17.52*	*17.79*	*18.75*	*17.74*	*18.31*	*18.65*	*18.83*	*17.97*	*18.63*	*18.00*	
2002.05	mean	43.54	45.12	43.56	46.07	45.03	46.01	45.26	43.08	45.01	44.58	43.41	43.73	44.94	46.54	44.96	
	std.dev.	*17.95*	*18.64*	*17.61*	*18.01*	*18.29*	*18.28*	*18.69*	*18.77*	*18.64*	*18.01*	*18.60*	*19.05*	*17.57*	*18.89*	*18.34*	
2002.11	mean	43.86	45.36	43.64	45.65	44.94	45.22	45.30	42.66	44.78	44.78	43.47	43.67	44.94	46.57	44.72	
	std.dev.	*17.86*	*18.68*	*17.96*	*17.89*	*18.17*	*17.71*	*18.62*	*18.19*	*18.34*	*18.71*	*18.78*	*18.91*	*17.67*	*18.69*	*18.06*	
2003.04	mean	45.52	46.14	44.52	46.19	46.27	44.85	45.86	41.49	45.47	44.89	44.37	44.87	45.71	46.79	45.29	
	std.dev.	*19.24*	*18.83*	*17.69*	*17.98*	*18.56*	*17.77*	*18.40*	*18.09*	*18.42*	*18.46*	*18.54*	*18.77*	*18.14*	*18.85*	*18.36*	
2003.11	mean	45.20	46.06	44.41	46.37	46.23	44.87	45.84	41.46	45.28	45.01	44.41	44.78	45.66	46.62	45.40	
	std.dev.	*18.47*	*18.73*	*17.38*	*18.31*	*18.24*	*17.79*	*18.51*	*17.86*	*18.18*	*18.76*	*18.48*	*18.84*	*18.21*	*18.61*	*18.27*	
Total	mean	44.00	45.25	43.67	45.57	44.98	45.05	45.00	42.45	44.74	44.38	43.46	43.82	44.92	46.18	44.59	
	std.dev.	*18.08*	*18.56*	*17.60*	*17.93*	*18.16*	*18.10*	*18.24*	*18.62*	*18.33*	*17.96*	*18.44*	*18.65*	*17.91*	*18.47*	*18.25*	

Granados Zambrano, Paulina (2011), Understanding Individuals' Beliefs
European University Institute
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Gender (1 male, 2 female)

date		france	belgium	holand	germany	italy	luxembour	denmark	ireland	united ki	greece	spain	portugal	finland	sweden	austria	T
1997.04	mean	1.51	1.52	1.51	1.52	1.52	1.52	1.51	1.51	1.52	1.51	1.52	1.53	1.52	1.51	1.53	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
1997.11	mean	1.51	1.52	1.51	1.52	1.52	1.52	1.51	1.51	1.52	1.51	1.52	1.53	1.52	1.51	1.53	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
1998.05	mean	1.51	1.52	1.51	1.52	1.52	1.52	1.51	1.51	1.52	1.51	1.52	1.53	1.52	1.51	1.53	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
1998.11	mean	1.52	1.52	1.51	1.52	1.52	1.52	1.51	1.52	1.52	1.51	1.52	1.53	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
1999.04	mean	1.52	1.52	1.51	1.52	1.52	1.52	1.51	1.52	1.52	1.51	1.52	1.53	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
1999.11	mean	1.52	1.52	1.51	1.52	1.52	1.52	1.51	1.51	1.52	1.51	1.52	1.53	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
2000.05	mean	1.52	1.52	1.51	1.52	1.52	1.53	1.51	1.52	1.52	1.51	1.51	1.53	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
2000.12	mean	1.52	1.52	1.51	1.52	1.52	1.53	1.51	1.52	1.52	1.51	1.51	1.53	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
2001.05	mean	1.52	1.52	1.51	1.52	1.52	1.52	1.51	1.51	1.52	1.51	1.52	1.53	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
2001.11	mean	1.52	1.52	1.51	1.52	1.52	1.53	1.51	1.52	1.52	1.51	1.52	1.53	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
2002.05	mean	1.52	1.52	1.51	1.52	1.52	1.52	1.51	1.52	1.52	1.51	1.52	1.53	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
2002.11	mean	1.52	1.52	1.51	1.52	1.52	1.53	1.51	1.52	1.52	1.51	1.52	1.53	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
2003.04	mean	1.52	1.52	1.51	1.52	1.52	1.51	1.51	1.51	1.52	1.51	1.51	1.52	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
2003.11	mean	1.52	1.52	1.51	1.52	1.52	1.51	1.51	1.51	1.52	1.51	1.51	1.52	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
Total	mean	1.52	1.52	1.51	1.52	1.52	1.52	1.51	1.51	1.52	1.51	1.52	1.52	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	

Head of the household (1 yes, 2 no)

date		france	belgium	holand	germany	italy	luxembour	denmark	ireland	united ki	greece	spain	portugal	finland	sweden	austria	T
1997.04	mean	1.51	1.52	1.51	1.52	1.52	1.52	1.51	1.51	1.52	1.51	1.52	1.53	1.52	1.51	1.53	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
1997.11	mean	1.51	1.52	1.51	1.52	1.52	1.52	1.51	1.51	1.52	1.51	1.52	1.53	1.52	1.51	1.53	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
1998.05	mean	1.51	1.52	1.51	1.52	1.52	1.52	1.51	1.51	1.52	1.51	1.52	1.53	1.52	1.51	1.53	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
1998.11	mean	1.52	1.52	1.51	1.52	1.52	1.52	1.51	1.52	1.52	1.51	1.52	1.53	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
1999.04	mean	1.52	1.52	1.51	1.52	1.52	1.52	1.51	1.52	1.52	1.51	1.52	1.53	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
1999.11	mean	1.52	1.52	1.51	1.52	1.52	1.52	1.51	1.51	1.52	1.51	1.52	1.53	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
2000.05	mean	1.52	1.52	1.51	1.52	1.52	1.53	1.51	1.52	1.52	1.51	1.51	1.53	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
2000.12	mean	1.52	1.52	1.51	1.52	1.52	1.53	1.51	1.52	1.52	1.51	1.51	1.53	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
2001.05	mean	1.52	1.52	1.51	1.52	1.52	1.52	1.51	1.51	1.52	1.51	1.52	1.53	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
2001.11	mean	1.52	1.52	1.51	1.52	1.52	1.53	1.51	1.52	1.52	1.51	1.52	1.53	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
2002.05	mean	1.52	1.52	1.51	1.52	1.52	1.52	1.51	1.52	1.52	1.51	1.52	1.53	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
2002.11	mean	1.52	1.52	1.51	1.52	1.52	1.53	1.51	1.52	1.52	1.51	1.52	1.53	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
2003.04	mean	1.52	1.52	1.51	1.52	1.52	1.51	1.51	1.51	1.52	1.51	1.51	1.52	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
2003.11	mean	1.52	1.52	1.51	1.52	1.52	1.51	1.51	1.51	1.52	1.51	1.51	1.52	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	
Total	mean	1.52	1.52	1.51	1.52	1.52	1.52	1.51	1.51	1.52	1.51	1.52	1.52	1.52	1.51	1.52	
	std.dev.	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	

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Appendix 2.5: Estimated equations.

Dependent variable equal to 1 if individual against the introduction of the Euro.

1999

Name of regression	Covariates		Sample periods		
	X_d	X_s	before	during	after
1999full	poldis persuade	newstv newspaper newsradio	1997.04 1997.11 1998.05	1998.11 1999.04	1999.11 2000.05 2000.12
1999full2a	poldis persuade explife expeco expfin expunemp expjob	newstv newspaper newsradio	1997.11	1998.11	1999.11 2000.12
1999full2b	poldis persuade identity	newstv newspaper newsradio knowledge	1998.05	1998.11	1999.11 2000.05 2000.12

2002

Name of regression	Covariates		Sample periods		
	X_d	X_s	before	during	after
2002full	poldis persuade	knowledge trustec trustep trustecb	2000.05 2000.12 2001.05	2001.11 2002.05	2002.11 2003.04 2003.11
2002full2a	poldis persuade identity satis pride	knowledge trustec trustep trustecb trustpress trustradio trusttv trustpol	2000.12	2001.11 2002.05	2003.11
2002full2b	poldis persuade identity satis pride explife expeco expfin expunemp expjob	knowledge trustec trustep trustecb trustpress trustradio trusttv trustpol	2000.12	2001.11	2003.11

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Appendix 2.6: Estimated equations, reduced forms.

Dependent variable equal 1 if individual against the introduction of the Euro.

Name of regression	Covariates			Sample periods		
	X_d	X_s	interaction terms	before	during	after
interaction1999a	poldis persuade explife expeco expfin expunemp expjob	newstv newspaper newsradio	poldis-during persuade-during exp*-during news*-during	1997.11	1998.11	1999.11 2000.12
interaction1999b	poldis persuade identity	newstv newspaper newsradio knowledge	poldis-during persuade-during indentity-during news*-during knowledge-during	1998.05	1998.11	1999.11 2000.05 2000.12
interaction2002a	poldis persuade	knowledge trustec trustep trustecb	poldis-during persuade-during knowledge-during trust*-during	2000.05 2000.12 2001.05	2001.11 2002.05	2002.11 2003.04 2003.11
interaction2002b	poldis persuade identity pride satisfaction	knowledge trustec trustep trusecb trustpress trustTV trustradio trustpol	poldis-during persuade-during identity-during pride-during satisfaction-during knowledge-during trust*-during	2000.12	2001.11 2002.05	2003.11

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Appendix 2.7: dprobit 1999

	-1 'fullantes'	-2 'full2a antes'	-3 'full2bantes'	-4 'fulldurante'	-5 'full2adurante'	-6 'full2bdurante'	-7 'fulldespues'	-8 'full2adespues'	-9 'full2bdespues'
poldis==occasionally	-0.025	-0.024	0.025	-0.046	-0.041	-0.024	-0.048	-0.022	-0.001
	(3.51)**	(1.67)	(2.03)*	(5.77)**	(3.25)**	(2.08)*	(7.09)**	(2.35)*	(0.07)
poldis==frequently	-0.048	-0.043	0.033	-0.054	-0.036	-0.005	-0.064	-0.013	0.011
	(4.72)**	(2.09)*	(1.77)	(4.82)**	(2.08)*	(0.33)	(6.36)**	(0.90)	(0.97)
persuade==rarely	-0.028	-0.003	-0.025	-0.028	-0.013	-0.02	-0.025	-0.015	-0.005
	(3.36)**	(0.20)	(1.82)	(3.01)**	(0.91)	(1.52)	(3.18)**	(1.40)	(0.57)
persuade==from time to time	-0.034	-0.007	-0.014	-0.037	-0.023	-0.006	-0.058	-0.038	-0.03
	(4.32)**	(0.46)	(1.01)	(4.14)**	(1.71)	(0.45)	(7.54)**	(3.55)**	(3.77)**
persuade==often	-0.024	-0.009	-0.005	-0.024	0.022	0.01	-0.04	-0.026	-0.018
	(2.31)*	(0.43)	(0.27)	(2.03)*	(1.18)	(0.56)	(3.87)**	(1.86)	(1.67)
newstv==less often	-0.004	-0.087	-0.018	0.03	-0.019	0.003	-0.024	-0.005	-0.009
	(0.14)	(1.47)	(0.33)	(0.88)	(0.35)	(0.07)	(0.86)	(0.11)	(0.32)
newstv==once or twice a week	-0.029	-0.049	-0.054	-0.042	-0.047	-0.014	-0.022	-0.015	0
	(1.07)	(0.90)	(1.13)	(1.38)	(0.96)	(0.34)	(0.84)	(0.41)	(0.01)
newstv==several times a week	-0.038	-0.04	-0.078	-0.041	-0.032	-0.005	-0.048	-0.025	-0.018
	(1.46)	(0.78)	(1.73)	(1.41)	(0.66)	(0.14)	(1.99)*	(0.71)	(0.69)
newstv==everyday	-0.064	-0.047	-0.095	-0.058	-0.048	-0.027	-0.055	-0.036	-0.02
	(2.47)*	(0.92)	(1.99)*	(1.91)	(0.97)	(0.74)	(2.27)*	(1.02)	(0.77)
newspaper==less often	-0.02	0.027	-0.02	-0.021	-0.035	-0.031	-0.031	0	-0.013
	(1.67)	(1.08)	(0.92)	(1.64)	(1.79)	(1.75)	(2.77)**	(0.02)	(1.08)
newspaper==once or twice a week	-0.009	0.013	0.008	-0.03	-0.033	-0.041	-0.046	-0.023	-0.02
	(0.77)	(0.53)	(0.39)	(2.36)*	(1.68)	(2.33)*	(4.16)**	(1.43)	(1.72)
newspaper==several times a week	-0.028	0.009	-0.002	-0.029	-0.016	-0.028	-0.051	-0.008	-0.019
	(2.39)*	(0.36)	(0.11)	(2.35)*	(0.83)	(1.60)	(4.64)**	(0.52)	(1.64)
newspaper==everyday	-0.061	-0.015	-0.056	-0.061	-0.052	-0.05	-0.087	-0.038	-0.05
	(5.62)**	(0.65)	(2.86)**	(5.30)**	(2.89)**	(3.05)**	(8.50)**	(2.59)**	(4.56)**
newsradio==less often	-0.022	-0.002	-0.022	-0.04	-0.011	-0.009	-0.023	-0.006	-0.015
	(1.94)	(0.07)	(1.11)	(3.31)**	(0.56)	(0.50)	(2.11)*	(0.38)	(1.30)
newsradio==once or twice a week	-0.015	-0.019	0.005	-0.007	0.014	0.008	-0.039	-0.031	-0.024
	(1.15)	(0.73)	(0.24)	(0.54)	(0.69)	(0.44)	(3.30)**	(1.93)	(1.97)*
newsradio==several times a week	-0.019	0.008	-0.018	-0.018	-0.004	0.002	-0.024	-0.012	-0.009
	(1.65)	(0.35)	(0.92)	(1.47)	(0.20)	(0.12)	(2.26)*	(0.82)	(0.81)
newsradio==everyday	-0.024	0.004	-0.029	-0.042	-0.024	-0.017	-0.033	-0.013	-0.022
	(2.39)*	(0.19)	(1.64)	(3.86)**	(1.41)	(1.12)	(3.44)**	(0.98)	(2.14)*
gender==male	-0.078	-0.085	-0.065	-0.065	-0.044	-0.044	-0.079	-0.065	-0.065
	(12.54)**	(6.89)**	(6.02)**	(9.38)**	(4.14)**	(4.52)**	(12.90)**	(7.72)**	(10.09)**
couple==with couple	-0.02	-0.025	-0.009	-0.022	-0.023	-0.017	-0.019	-0.029	-0.013
	(3.37)**	(2.11)*	(0.89)	(3.34)**	(2.21)*	(1.77)	(3.22)**	(3.62)**	(2.09)*
head==yes	0.009	0.008	-0.007	0.01	0	0.008	0.017	0.013	0.016
	(1.35)	(0.64)	(0.64)	(1.37)	(0.01)	(0.81)	(2.62)**	(1.42)	(2.32)*
edu	-0.009	-0.007	-0.002	-0.008	-0.005	-0.002	-0.01	-0.006	-0.004
	(13.70)**	(5.35)**	(1.99)*	(10.99)**	(4.87)**	(2.51)*	(15.31)**	(6.99)**	(6.12)**
age	0.001	0	0	0.001	0.001	0	0.002	0.001	0.001
	(5.03)**	(0.47)	(0.67)	(4.77)**	(1.59)	(0.43)	(10.41)**	(5.17)**	(5.30)**
country==france	-0.269	-0.293	-0.216	-0.244	-0.208	-0.192	-0.302	-0.269	-0.254
	(21.15)**	(11.53)**	(10.90)**	(21.42)**	(11.26)**	(11.40)**	(28.67)**	(17.75)**	(21.96)**
country==belgium	-0.278	-0.313	-0.226	-0.266	-0.233	-0.22	-0.344	-0.324	-0.319
	(22.37)**	(12.61)**	(11.98)**	(25.22)**	(13.62)**	(14.25)**	(36.23)**	(23.91)**	(31.25)**
country==holand	-0.232	-0.212	-0.226	-0.241	-0.213	-0.206	-0.297	-0.283	-0.275
	(17.81)**	(7.84)**	(11.62)**	(20.88)**	(11.78)**	(12.89)**	(26.67)**	(18.27)**	(23.40)**
country==germany	-0.109	-0.178	-0.109	-0.167	-0.088	-0.096	-0.226	-0.219	-0.187
	(8.22)**	(6.51)**	(5.23)**	(13.46)**	(4.13)**	(5.26)**	(19.87)**	(13.62)**	(15.48)**
country==italy	-0.398	-0.426	-0.311	-0.307	-0.282	-0.264	-0.37	-0.347	-0.341
	(36.15)**	(19.46)**	(17.95)**	(30.96)**	(17.52)**	(17.90)**	(39.80)**	(26.23)**	(33.25)**
country==luxembourg	-0.305	-0.325	-0.248	-0.276	-0.234	-0.21	-0.334	-0.32	-0.291
	(21.77)**	(11.54)**	(11.13)**	(22.61)**	(12.00)**	(10.85)**	(28.57)**	(19.94)**	(21.34)**
country==denmark	0.044	0.069	0.095	-0.01	0.065	0.057	-0.101	-0.081	-0.079
	(2.89)**	(2.26)*	(3.66)**	(0.62)	(2.61)**	(2.54)*	(7.32)**	(4.22)**	(5.53)**
country==ireland	-0.344	-0.354	-0.279	-0.28	-0.24	-0.245	-0.342	-0.329	-0.33
	(29.05)**	(14.61)**	(15.42)**	(25.95)**	(13.05)**	(16.20)**	(33.16)**	(23.08)**	(31.12)**
country==greece	-0.324	-0.341	-0.274	-0.253	-0.24	-0.22	-0.344	-0.337	-0.329
	(26.36)**	(13.75)**	(15.08)**	(22.22)**	(13.88)**	(14.01)**	(33.79)**	(24.06)**	(31.29)**
country==spain	-0.338	-0.346	-0.269	-0.28	-0.239	-0.229	-0.351	-0.323	-0.312
	(28.56)**	(14.53)**	(14.74)**	(27.35)**	(13.96)**	(14.87)**	(36.85)**	(23.64)**	(28.90)**
country==portugal	-0.279	-0.298	-0.231	-0.247	-0.209	-0.211	-0.335	-0.311	-0.312
	(20.27)**	(10.81)**	(11.14)**	(21.20)**	(10.65)**	(12.88)**	(32.55)**	(20.67)**	(28.12)**
country==finland	-0.029	0.041	-0.112	-0.147	-0.081	-0.121	-0.153	-0.104	-0.153
	(1.98)*	(1.41)	(5.16)**	(11.10)**	(3.67)**	(6.55)**	(12.00)**	(5.74)**	(11.74)**
country==sweden	-0.013	0.009	0.006	-0.034	0.03	-0.02	-0.064	-0.019	-0.075
	(0.89)	(0.30)	(0.27)	(2.14)*	(1.21)	(0.94)	(4.30)**	(0.91)	(5.00)**
country==austria	-0.172	-0.218	-0.169	-0.178	-0.137	-0.136	-0.241	-0.231	-0.216
	(12.53)**	(8.00)**	(7.81)**	(13.71)**	(6.48)**	(7.25)**	(20.39)**	(13.94)**	(17.09)**
knowledge==box 2		-0.019	-0.056		-0.046	-0.019		-0.06	-0.037
		(0.75)	(2.73)**		(2.18)*	(0.99)		(3.36)**	(2.87)**
knowledge==box 3		-0.016	-0.067		-0.077	-0.054		-0.097	-0.083
		(0.68)	(3.37)**		(3.92)**	(3.07)**		(5.88)**	(6.82)**
knowledge==box 4		-0.041	-0.07		-0.088	-0.054		-0.128	-0.104
		(1.72)	(3.45)**		(4.42)**	(2.99)**		(7.84)**	(8.49)**
knowledge==box 5		-0.078	-0.09		-0.112	-0.07		-0.153	-0.128
		(3.37)**	(4.48)**		(5.70)**	(3.86)**		(9.52)**	(10.67)**
knowledge==box 6		-0.124	-0.091		-0.136	-0.101		-0.178	-0.141
		(4.92)**	(4.18)**		(6.69)**	(5.27)**		(10.71)**	(11.04)**
knowledge==box 7		-0.165	-0.115		-0.123	-0.084		-0.193	-0.159
		(6.04)**	(4.89)**		(5.52)**	(3.97)**		(11.26)**	(11.98)**
knowledge==box 8		-0.146	-0.092		-0.142	-0.109		-0.206	-0.176
		(4.45)**	(3.26)**		(5.66)**	(4.63)**		(10.79)**	(11.84)**
knowledge==box 9		-0.119	-0.086		-0.122	-0.055		-0.218	-0.186
		(2.27)*	(1.99)*		(3.03)**	(1.28)		(7.44)**	(8.40)**
knowledge==know a great deal		-0.097	-0.015		-0.174	-0.109		-0.194	-0.153
		(1.56)	(0.26)		(2.97)**	(2.35)*		(5.80)**	(5.93)**
explife==same		-0.053			-0.057			-0.069	
		(2.54)*			(2.93)**			(4.02)**	
explife==better		-0.077			-0.063			-0.092	
		(3.36)**			(3.09)**			(5.05)**	
expeco==same		-0.085			-0.049			-0.061	
		(5.43)**			(3.77)**			(5.56)**	
expeco==better		-0.143			-0.094			-0.098	
		(7.78)**			(5.83)**			(7.61)**	
expfin==same		0.003			-0.072			-0.044	
		(0.18)			(4.29)**			(3.11)**	
expfin==better		0.012			-0.076			-0.012	
		(0.54)			(4.02)**			(0.73)	
expunemp==same		-0.04			-0.013			-0.021	
		(2.54)*			(0.97)			(1.94)	
expunemp==better		-0.086			-0.044			-0.079	
		(4.70)**			(2.82)**			(6.41)**	
expjob==same		-0.025			-0.043			-0.039	
		(1.13)			(2.15)*			(2.25)*	
expjob==better		-0.022			-0.036			-0.032	
		(0.88)			(1.58)			(1.69)	
identity==(nationality) and european			-0.216			-0.241			-0.256
			(21.87)**			(26.40)**			(43.06)**
identity==european and (nationality)			-0.229			-0.219			-0.251
			(12.95)**			(14.62)**			(23.38)**
identity==european only			-0.213			-0.188			-0.237
			(10.27)**			(10.12)**			(17.52)**
Observations	41703	11064	13315	27792	11391	13671	42440	22883	41015
Robust z statistics in parentheses									
* significant at 5%; ** significant at 1%									

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Appendix 2.8: dprobit 2002

	-1 'fullantes'	-2 'full2aantes'	-3 'full2bantes'	-4 'fulldurante'	-5 'full2adurante'	-6 'full2ddurante'	-7 'fulldespues'	-8 'full2adespues'	-9 'full2bdespues'
poldis==occasionally	-0.019	-0.025	-0.025	-0.026	-0.011	-0.03	-0.036	-0.008	0.003
	(2.72)**	(1.74)	(1.60)	(3.35)**	(1.30)	(2.25)*	(5.55)**	(0.64)	(0.19)
poldis==frequently	-0.059	-0.053	-0.056	-0.044	-0.025	-0.057	-0.054	-0.022	-0.017
	(5.56)**	(2.59)**	(2.55)*	(4.06)**	(2.10)*	(3.01)**	(6.08)**	(1.21)	(0.88)
persuade==rarely	-0.017	-0.013	-0.017	0.002	0.012	-0.001	-0.008	-0.037	-0.029
	(2.01)*	(0.74)	(0.90)	(0.25)	(1.16)	(0.09)	(1.14)	(2.49)*	(1.80)
persuade==from time to t	-0.032	-0.02	-0.014	-0.016	-0.002	-0.012	-0.015	-0.016	-0.014
	(3.97)**	(1.20)	(0.78)	(1.87)	(0.17)	(0.80)	(2.13)*	(1.10)	(0.87)
persuade==often	-0.016	-0.03	-0.03	-0.008	0.004	-0.035	-0.009	-0.016	-0.021
	(1.47)	(1.40)	(1.27)	(0.74)	(0.32)	(1.80)	(0.99)	(0.85)	(1.02)
knowledge==box 2	-0.043	-0.076	-0.074	-0.053	-0.028	-0.092	-0.05	-0.034	-0.034
	(3.34)**	(2.62)**	(2.26)*	(4.04)**	(1.81)	(3.48)**	(4.55)**	(1.39)	(1.22)
knowledge==box 3	-0.082	-0.055	-0.072	-0.098	-0.07	-0.095	-0.071	-0.056	-0.07
	(6.86)**	(2.00)*	(2.35)*	(8.10)**	(4.97)**	(3.81)**	(6.90)**	(2.45)*	(2.73)**
knowledge==box 4	-0.088	-0.069	-0.076	-0.102	-0.067	-0.111	-0.091	-0.083	-0.089
	(7.25)**	(2.54)*	(2.46)*	(8.38)**	(4.76)**	(4.53)**	(8.77)**	(3.59)**	(3.50)**
knowledge==box 5	-0.123	-0.086	-0.086	-0.128	-0.083	-0.122	-0.089	-0.065	-0.067
	(10.41)**	(3.21)**	(2.84)**	(10.76)**	(5.97)**	(4.99)**	(8.62)**	(2.77)**	(2.58)**
knowledge==box 6	-0.136	-0.11	-0.116	-0.136	-0.09	-0.145	-0.102	-0.084	-0.086
	(10.67)**	(3.89)**	(3.69)**	(10.79)**	(6.07)**	(5.80)**	(9.34)**	(3.43)**	(3.18)**
knowledge==box 7	-0.16	-0.103	-0.118	-0.141	-0.082	-0.137	-0.102	-0.047	-0.049
	(11.92)**	(3.45)**	(3.59)**	(10.65)**	(5.13)**	(5.29)**	(8.74)**	(1.78)	(1.66)
knowledge==box 8	-0.179	-0.171	-0.177	-0.14	-0.07	-0.115	-0.1	-0.061	-0.05
	(11.94)**	(5.45)**	(5.20)**	(9.19)**	(3.80)**	(3.77)**	(7.43)**	(1.98)*	(1.49)
knowledge==box 9	-0.178	-0.17	-0.185	-0.131	-0.08	-0.138	-0.091	-0.032	-0.02
	(7.54)**	(3.50)**	(3.62)**	(5.62)**	(2.75)**	(3.01)**	(4.25)**	(0.71)	(0.42)
knowledge==know a grea	-0.151	-0.092	-0.107	-0.169	-0.132	-0.151	-0.051	0.044	0.023
	(5.67)**	(1.70)	(1.89)	(6.03)**	(3.63)**	(2.48)*	(2.00)*	(0.85)	(0.41)
trustep==tend to trust	-0.075	-0.041	-0.012	-0.069	-0.068	-0.062	-0.09	-0.066	-0.1
	(6.13)**	(1.57)	(0.42)	(5.31)**	(4.42)**	(2.45)*	(8.56)**	(2.98)**	(4.10)**
trustep==tend not to trust	0.092	0.109	0.14	0.061	0.045	0.064	0.068	0.095	0.052
	(6.50)**	(3.78)**	(4.27)**	(3.95)**	(2.54)*	(2.18)*	(5.32)**	(3.75)**	(1.87)
trustec==tend to trust	-0.076	-0.079	-0.089	-0.06	-0.042	-0.049	-0.065	-0.07	-0.029
	(6.51)**	(3.35)**	(3.33)**	(4.87)**	(2.96)**	(2.11)*	(6.61)**	(3.42)**	(1.31)
trustec==tend not to trust	0.041	0.026	0.001	0.068	0.055	0.056	0.044	0.039	0.071
	(3.14)**	(1.02)	(0.02)	(4.65)**	(3.34)**	(2.11)*	(3.67)**	(1.68)	(2.79)**
trustecb==tend to trust	-0.103	-0.083	-0.08	-0.069	-0.059	-0.08	-0.092	-0.098	-0.092
	(11.67)**	(4.42)**	(3.83)**	(7.17)**	(5.25)**	(4.32)**	(12.17)**	(6.30)**	(5.37)**
trustecb==tend not to trus	0.084	0.049	0.042	0.084	0.079	0.07	0.084	0.069	0.076
	(8.11)**	(2.34)*	(1.83)	(7.12)**	(5.94)**	(3.26)**	(9.03)**	(3.78)**	(3.80)**
gender==male	-0.07	-0.075	-0.064	-0.065	-0.059	-0.061	-0.058	-0.067	-0.058
	(11.11)**	(5.92)**	(4.67)**	(9.81)**	(8.00)**	(5.09)**	(10.66)**	(6.07)**	(4.83)**
couple==with couple	-0.016	-0.021	-0.029	-0.012	-0.001	0.004	-0.023	-0.009	-0.016
	(2.60)**	(1.73)	(2.21)*	(1.83)	(0.20)	(0.32)	(4.39)**	(0.84)	(1.37)
head==yes	0.013	0.031	0.016	-0.001	-0.011	-0.022	0.009	0.013	0
	(1.85)	(2.23)*	(1.06)	(0.17)	(1.37)	(1.68)	(1.55)	(1.06)	(0.01)
edu	-0.007	-0.005	-0.004	-0.007	-0.004	-0.004	-0.008	-0.007	-0.006
	(10.91)**	(3.54)**	(2.89)**	(9.10)**	(5.40)**	(3.55)**	(13.08)**	(5.97)**	(4.96)**
age	0.001	0.001	0.001	0.001	0	0	0.001	0.001	0.001
	(6.69)**	(2.39)*	(1.81)	(5.35)**	(1.04)	(0.59)	(7.02)**	(1.76)	(1.55)
country==france	-0.265	-0.255	-0.231	-0.181	-0.154	-0.172	-0.239	-0.248	-0.248
	(22.71)**	(10.27)**	(8.15)**	(15.80)**	(11.34)**	(7.42)**	(27.47)**	(12.78)**	(11.86)**
country==belgium	-0.31	-0.315	-0.299	-0.24	-0.222	-0.222	-0.277	-0.31	-0.302
	(28.49)**	(14.01)**	(11.61)**	(23.26)**	(18.88)**	(10.70)**	(35.55)**	(18.91)**	(17.27)**
country==holand	-0.227	-0.231	-0.226	-0.194	-0.173	-0.179	-0.178	-0.176	-0.195
	(17.40)**	(7.99)**	(6.96)**	(16.07)**	(12.22)**	(7.38)**	(17.05)**	(8.04)**	(8.26)**
country==germany	-0.179	-0.161	-0.135	-0.179	-0.158	-0.169	-0.213	-0.217	-0.225
	(14.78)**	(6.18)**	(4.56)**	(15.65)**	(11.91)**	(7.43)**	(23.19)**	(10.55)**	(9.97)**
country==italy	-0.34	-0.338	-0.307	-0.246	-0.225	-0.24	-0.244	-0.231	-0.233
	(31.93)**	(15.06)**	(11.73)**	(23.28)**	(17.56)**	(10.98)**	(28.62)**	(11.00)**	(10.32)**
country==luxembourg	-0.298	-0.271	-0.245	-0.246	-0.225	-0.234	-0.261	-0.271	-0.273
	(22.16)**	(8.05)**	(6.48)**	(20.40)**	(15.63)**	(9.08)**	(27.41)**	(12.56)**	(12.17)**
country==denmark	-0.022	-0.062	-0.037	-0.019	0.024	0.023	-0.102	-0.103	-0.108
	(1.47)	(2.10)*	(1.12)	(1.24)	(1.31)	(0.80)	(8.73)**	(4.12)**	(3.94)**
country==ireland	-0.287	-0.311	-0.282	-0.231	-0.218	-0.246	-0.261	-0.298	-0.292
	(23.44)**	(13.24)**	(10.33)**	(21.06)**	(17.95)**	(12.10)**	(31.36)**	(17.15)**	(15.73)**
country==greece	-0.303	-0.347	-0.348	-0.243	-0.244	-0.284	-0.213	-0.217	-0.236
	(26.55)**	(15.74)**	(14.41)**	(24.20)**	(22.67)**	(15.91)**	(22.60)**	(10.43)**	(10.80)**
country==spain	-0.304	-0.262	-0.244	-0.242	-0.222	-0.234	-0.256	-0.246	-0.236
	(27.49)**	(10.35)**	(8.57)**	(24.21)**	(18.68)**	(11.45)**	(31.01)**	(12.33)**	(10.59)**
country==portugal	-0.274	-0.296	-0.276	-0.222	-0.213	-0.241	-0.25	-0.283	-0.28
	(22.47)**	(11.86)**	(9.53)**	(20.40)**	(17.21)**	(11.81)**	(29.71)**	(15.74)**	(14.49)**
country==finland	-0.103	-0.142	-0.097	-0.102	-0.106	-0.056	-0.215	-0.257	-0.255
	(7.45)**	(5.30)**	(3.19)**	(7.48)**	(7.17)**	(2.13)*	(23.07)**	(13.55)**	(12.53)**
country==sweden	0.015	0.038	0.077	-0.079	-0.073	-0.091	-0.064	-0.043	-0.059
	(0.95)	(1.20)	(2.18)*	(5.60)**	(4.66)**	(3.59)**	(5.26)**	(1.67)	(2.11)*
country==austria	-0.213	-0.21	-0.197	-0.21	-0.197	-0.224	-0.249	-0.263	-0.262
	(16.57)**	(7.98)**	(6.66)**	(18.79)**	(15.78)**	(10.88)**	(29.16)**	(13.70)**	(12.60)**
satis==not very satisfied		-0.044	-0.048		-0.011	-0.019		-0.036	-0.03
		(1.22)	(1.23)		(0.54)	(0.55)		(1.26)	(0.95)
satis==fairly satisfied		-0.069	-0.031		-0.091	-0.077		-0.108	-0.088
		(1.99)*	(0.80)		(4.48)**	(2.20)*		(3.80)**	(2.80)**
satis==very satisfied		-0.071	-0.035		-0.107	-0.105		-0.126	-0.103
		(1.99)*	(0.87)		(5.49)**	(3.10)**		(4.51)**	(3.27)**
trustpress==tend to trust		0.003	-0.003		-0.021	-0.021		-0.014	-0.005
		(0.21)	(0.16)		(2.49)*	(1.57)		(1.11)	(0.33)
trustradio==tend to trust		-0.036	-0.025		0.017	0.035		0.011	0.002
		(1.83)	(1.16)		(1.62)	(2.03)*		(0.73)	(0.12)
trusttv==tend to trust		0.031	0.025		0.023	0.015		0.015	0.016
		(1.69)	(1.23)		(2.34)*	(0.91)		(1.07)	(1.05)
trustpol==tend to trust		-0.068	-0.067		-0.04	-0.05		-0.034	-0.018
		(5.53)**	(4.26)**		(4.91)**	(3.85)**		(2.60)**	(1.22)
identity==(nationality) and european		-0.248	-0.256		-0.19	-0.172		-0.176	-0.181
		(20.95)**	(19.93)**		(26.80)**	(15.14)**		(16.24)**	(15.45)**
identity==european and (nationality)		-0.234	-0.236		-0.193	-0.198		-0.221	-0.234
		(10.05)**	(9.49)**		(16.19)**	(9.68)**		(11.43)**	(11.61)**
identity==european only		-0.217	-0.205		-0.186	-0.177		-0.159	-0.166
		(7.23)**	(6.18)**		(11.91)**	(6.80)**		(5.87)**	(5.91)**
pride==not very proud		0.004	0.016		-0.027	-0.013		0.016	0.015
		(0.10)	(0.35)		(1.13)	(0.32)		(0.41)	(0.36)
pride==fairly proud		0.007	0.03		-0.053	-0.003		-0.002	0.003
		(0.18)	(0.72)		(2.34)*	(0.07)		(0.07)	(0.09)
pride==very proud		0.026	0.047		-0.027	0.028		0.019	0.019
		(0.69)	(1.10)		(1.20)	(0.75)		(0.52)	(0.50)
explife==same			-0.019			-0.041			-0.03
			(0.71)			(1.89)			(1.52)
explife==better			-0.063			-0.055			-0.02
			(2.18)*			(2.33)*			(0.90)
expeco==same			-0.012			-0.01			-0.05
			(0.70)			(0.72)			(3.49)**
expeco==better			-0.045			-0.038			-0.079
			(2.11)*			(1.88)			(4.03)**
expfin==same			-0.048			-0.056			-0.004
			(2.08)*			(2.90)**			(0.24)
expfin==better			-0.008			-0.054			0.012
			(0.30)			(2.39)*			(0.57)
expunemp==same			-0.033			0.02			-0.009
			(1.83)			(1.42)			(0.64)
expunemp==better			-0.066			-0.006			-0.003
			(3.16)**			(0.29)			(0.15)
expjob==same			-0.067			-0.029			-0.012
			(2.43)*			(1.26)			(0.57)
expjob==better			-0.054			-0.019			0.008
			(1.80)			(0.72)			(0.31)
Observations	41848	11250	9422	28046	22774	9462	43302	11582	9700
Robust z statistics in parentheses									
* significant at 5%; ** significant at 1%									

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Appendix 2.9: Interaction 1999a

	-1 'before'	-2 'during'	-3 'after'	-4 'before wrt during'	-5 'after wrt during'	-6 'before/during interaction'	-7 after/during interaction'
Political discussion=yes	-0.034	-0.054	-0.038	-0.047	-0.045	-0.037	-0.039
	(2.55)*	(4.50)**	(4.25)**	(5.10)**	(6.15)**	(2.93)**	(4.47)**
Persuade Friends=yes	-0.017	-0.014	-0.032	-0.017	-0.025	-0.013	-0.032
	(1.47)	(1.37)	(4.14)**	(2.16)*	(4.08)**	(1.25)	(4.39)**
News TV=yes	-0.044	-0.042	-0.042	-0.043	-0.04	-0.043	-0.04
	(0.85)	(0.75)	(1.19)	(1.09)	(1.29)	(0.89)	(1.18)
Newspaper=yes	0.004	-0.048	-0.031	-0.026	-0.038	0.001	-0.028
	(0.18)	(2.88)**	(2.35)*	(1.97)*	(3.62)**	(0.04)	(2.19)*
News Radio=yes	-0.005	-0.018	-0.021	-0.015	-0.021	-0.01	-0.026
	(0.26)	(1.15)	(1.72)	(1.19)	(2.09)*	(0.54)	(2.22)*
Knowledge EU (policy, institutions)	-0.083	-0.074	-0.112	-0.08	-0.098	-0.079	-0.113
	(6.92)**	(6.84)**	(13.29)**	(9.70)**	(14.65)**	(7.13)**	(13.90)**
newexplife= same or better	-0.058	-0.064	-0.079	-0.063	-0.075	-0.053	-0.075
	(2.80)**	(3.20)**	(4.49)**	(4.25)**	(5.57)**	(2.71)**	(4.41)**
newexpeco= same or better	-0.107	-0.066	-0.078	-0.086	-0.075	-0.099	-0.075
	(7.06)**	(5.10)**	(7.20)**	(8.49)**	(8.92)**	(6.93)**	(7.15)**
newexpfin=same or better	0.002	-0.081	-0.043	-0.042	-0.058	0.003	-0.04
	(0.10)	(4.68)**	(3.00)**	(3.26)**	(5.21)**	(0.18)	(2.93)**
newexpunemp= same or better	-0.064	-0.029	-0.046	-0.046	-0.037	-0.053	-0.041
	(4.25)**	(2.27)*	(4.30)**	(4.63)**	(4.47)**	(3.85)**	(4.03)**
newexpjob= same or better	-0.024	-0.04	-0.038	-0.033	-0.04	-0.026	-0.035
	(1.09)	(1.94)	(2.19)*	(2.15)*	(2.99)**	(1.28)	(2.09)*
gender==male	-0.098	-0.05	-0.075	-0.075	-0.066	-0.075	-0.066
	(8.06)**	(4.72)**	(8.98)**	(9.03)**	(10.07)**	(9.04)**	(10.07)**
couple==with couple	-0.026	-0.025	-0.031	-0.027	-0.029	-0.026	-0.029
	(2.21)*	(2.45)*	(3.92)**	(3.32)**	(4.53)**	(3.28)**	(4.57)**
head==yes	0.009	0.001	0.013	0.004	0.008	0.004	0.009
	(0.68)	(0.11)	(1.39)	(0.49)	(1.17)	(0.49)	(1.21)
edu	-0.008	-0.006	-0.007	-0.007	-0.007	-0.007	-0.007
	(6.50)**	(5.57)**	(8.62)**	(8.68)**	(10.42)**	(8.61)**	(10.40)**
age	0	0	0.001	0	0.001	0	0.001
	(0.84)	(1.31)	(4.65)**	(0.45)	(4.60)**	(0.41)	(4.58)**
country==france	-0.276	-0.208	-0.27	-0.245	-0.247	-0.245	-0.248
	(10.96)**	(11.12)**	(18.04)**	(15.63)**	(21.12)**	(15.57)**	(21.04)**
country==belgium	-0.299	-0.232	-0.327	-0.269	-0.294	-0.27	-0.294
	(12.15)**	(13.45)**	(24.58)**	(18.15)**	(27.75)**	(18.06)**	(27.77)**
country==holand	-0.21	-0.214	-0.286	-0.223	-0.26	-0.222	-0.26
	(7.93)**	(11.71)**	(18.77)**	(13.90)**	(22.00)**	(13.80)**	(21.97)**
country==germany	-0.172	-0.099	-0.23	-0.13	-0.184	-0.132	-0.184
	(6.38)**	(4.73)**	(14.76)**	(7.59)**	(14.69)**	(7.63)**	(14.70)**
country==italy	-0.424	-0.283	-0.35	-0.354	-0.326	-0.353	-0.326
	(19.51)**	(17.44)**	(27.05)**	(26.49)**	(32.38)**	(26.37)**	(32.35)**
country==luxembourg	-0.315	-0.234	-0.321	-0.277	-0.291	-0.278	-0.291
	(11.16)**	(11.83)**	(19.94)**	(16.28)**	(22.95)**	(16.23)**	(22.94)**
country==denmark	0.076	0.068	-0.076	0.076	-0.023	0.076	-0.023
	(2.57)*	(2.74)**	(4.03)**	(3.85)**	(1.51)	(3.85)**	(1.54)
country==ireland	-0.36	-0.244	-0.335	-0.303	-0.303	-0.304	-0.304
	(15.24)**	(13.35)**	(24.11)**	(20.27)**	(27.37)**	(20.29)**	(27.36)**
country==greece	-0.331	-0.241	-0.341	-0.288	-0.306	-0.288	-0.306
	(13.47)**	(14.09)**	(25.12)**	(19.43)**	(28.47)**	(19.42)**	(28.57)**
country==spain	-0.338	-0.241	-0.325	-0.291	-0.295	-0.292	-0.296
	(14.21)**	(14.12)**	(24.06)**	(20.00)**	(27.79)**	(19.98)**	(27.69)**
country==portugal	-0.287	-0.207	-0.312	-0.249	-0.276	-0.249	-0.276
	(10.42)**	(10.55)**	(20.88)**	(14.79)**	(23.15)**	(14.76)**	(23.08)**
country==finland	0.036	-0.089	-0.124	-0.035	-0.109	-0.036	-0.11
	(1.26)	(4.10)**	(7.07)**	(1.96)	(7.96)**	(2.00)*	(7.97)**
country==sweden	0.003	0.021	-0.038	0.017	-0.015	0.017	-0.014
	(0.10)	(0.87)	(1.92)	(0.84)	(0.97)	(0.88)	(0.92)
country==austria	-0.209	-0.142	-0.24	-0.175	-0.205	-0.176	-0.205
	(7.75)**	(6.81)**	(14.94)**	(10.26)**	(16.06)**	(10.24)**	(16.02)**
event==during				-0.166	-0.103	-0.017	-0.086
				(22.71)**	(16.75)**	(0.20)	(1.17)
poldis*during						-0.017	-0.011
						(0.96)	(0.76)
persuade*during						-0.006	0.024
						(0.38)	(1.95)*
explife*during						-0.015	0.011
						(0.05)	(0.42)
expeco*during						0.032	0.009
						(1.54)	(0.57)
expfin*during						-0.091	-0.036
						(3.55)**	(1.64)
expunemp*during						0.018	0.016
						(0.93)	(1.02)
expjob*during						-0.012	-0.007
						(0.39)	(0.24)
newstv*during						0.004	0.011
						(0.05)	(0.16)
newspaper*during						-0.049	-0.022
						(1.87)	(1.09)
newsradio*during						-0.006	0.018
						(0.24)	(0.94)
knowledge*during						0.007	0.052
						(0.41)	(3.68)**
Observations	11064	11391	22883	22455	34274	22455	34274

Robust z statistics in parentheses
* significant at 5%; ** significant at 1%

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Appendix 2.10: Interaction 1999b

	-1 'before'	-2 'during'	-3 'after'	-4 'before wrt during'	-5 'after wrt during'	-6 'before/during interaction'	-7 'after/during interaction'
Political discussion=yes	0.009	-0.033	-0.01	-0.012	-0.017	0.005	-0.011
	(0.81)	(3.01)**	(1.52)	(1.55)	(2.82)**	(0.44)	(1.70)
Persuade Friends=yes	0.003	0.006	-0.028	0.004	-0.019	0.004	-0.029
	(0.26)	(0.69)	(4.79)**	(0.64)	(3.74)**	(0.43)	(5.07)**
News TV=yes	-0.099	-0.018	-0.022	-0.048	-0.02	-0.097	-0.022
	(2.01)*	(0.47)	(0.86)	(1.60)	(0.96)	(2.02)*	(0.88)
Newspaper=yes	-0.033	-0.048	-0.036	-0.043	-0.04	-0.029	-0.033
	(1.80)	(3.18)**	(3.66)**	(3.68)**	(4.82)**	(1.68)	(3.47)**
News Radio=yes	-0.03	-0.013	-0.022	-0.022	-0.02	-0.026	-0.024
	(1.78)	(0.92)	(2.37)*	(1.98)*	(2.55)*	(1.62)	(2.59)**
Knowledge EU (policy, institutions)	-0.044	-0.048	-0.09	-0.046	-0.078	-0.044	-0.09
	(4.22)**	(4.86)**	(13.95)**	(6.39)**	(14.33)**	(4.45)**	(14.41)**
Identity pro european	-0.238	-0.265	-0.277	-0.252	-0.275	-0.226	-0.27
	(24.51)**	(28.70)**	(47.20)**	(37.56)**	(55.18)**	(24.58)**	(47.68)**
gender==male	-0.072	-0.049	-0.073	-0.06	-0.067	-0.06	-0.067
	(6.75)**	(5.00)**	(11.49)**	(8.26)**	(12.51)**	(8.30)**	(12.51)**
couple==with couple	-0.014	-0.019	-0.016	-0.017	-0.016	-0.017	-0.016
	(1.39)	(2.05)*	(2.56)*	(2.46)*	(3.16)**	(2.47)*	(3.18)**
head==yes	-0.005	0.009	0.016	0.001	0.014	0.002	0.014
	(0.39)	(0.82)	(2.30)*	(0.17)	(2.39)*	(0.24)	(2.41)*
edu	-0.003	-0.003	-0.005	-0.003	-0.005	-0.003	-0.005
	(2.44)*	(3.10)**	(7.60)**	(3.94)**	(8.32)**	(3.93)**	(8.29)**
age	-0.001	0	0.001	0	0	0	0
	(2.36)*	(0.38)	(3.94)**	(1.80)	(3.26)**	(1.91)	(3.25)**
country==france	-0.208	-0.191	-0.252	-0.2	-0.236	-0.2	-0.235
	(10.46)**	(11.32)**	(21.95)**	(15.38)**	(24.73)**	(15.39)**	(24.67)**
country==belgium	-0.221	-0.221	-0.319	-0.224	-0.293	-0.223	-0.294
	(11.68)**	(14.48)**	(31.76)**	(18.59)**	(34.73)**	(18.52)**	(34.83)**
country==holand	-0.232	-0.21	-0.277	-0.223	-0.259	-0.222	-0.259
	(12.18)**	(13.29)**	(23.91)**	(18.06)**	(27.24)**	(18.01)**	(27.29)**
country==germany	-0.117	-0.104	-0.195	-0.112	-0.17	-0.111	-0.17
	(5.71)**	(5.81)**	(16.45)**	(8.21)**	(17.11)**	(8.16)**	(17.16)**
country==italy	-0.309	-0.264	-0.34	-0.287	-0.32	-0.286	-0.32
	(17.74)**	(17.81)**	(33.47)**	(25.17)**	(38.07)**	(25.15)**	(38.06)**
country==luxembourg	-0.249	-0.212	-0.295	-0.232	-0.273	-0.231	-0.273
	(11.26)**	(11.05)**	(22.02)**	(15.96)**	(24.49)**	(15.82)**	(24.50)**
country==denmark	0.095	0.057	-0.081	0.075	-0.043	0.075	-0.043
	(3.71)**	(2.53)*	(5.74)**	(4.44)**	(3.55)**	(4.43)**	(3.60)**
country==ireland	-0.277	-0.246	-0.33	-0.263	-0.307	-0.262	-0.308
	(15.34)**	(16.35)**	(31.31)**	(22.44)**	(35.23)**	(22.47)**	(35.28)**
country==greece	-0.268	-0.219	-0.328	-0.244	-0.299	-0.243	-0.3
	(14.84)**	(14.17)**	(31.49)**	(20.59)**	(34.32)**	(20.48)**	(34.44)**
country==spain	-0.265	-0.229	-0.31	-0.248	-0.289	-0.248	-0.289
	(14.47)**	(14.77)**	(28.73)**	(20.78)**	(32.28)**	(20.72)**	(32.27)**
country==portugal	-0.228	-0.211	-0.309	-0.222	-0.283	-0.22	-0.283
	(11.09)**	(12.95)**	(27.96)**	(17.07)**	(30.69)**	(16.96)**	(30.72)**
country==finland	-0.12	-0.123	-0.159	-0.123	-0.149	-0.123	-0.149
	(5.60)**	(6.77)**	(12.41)**	(8.80)**	(14.05)**	(8.76)**	(14.04)**
country==sweden	0.001	-0.022	-0.08	-0.012	-0.063	-0.011	-0.063
	(0.04)	(1.03)	(5.35)**	(0.72)	(5.11)**	(0.71)	(5.06)**
country==austria	-0.173	-0.141	-0.225	-0.157	-0.202	-0.157	-0.203
	(8.25)**	(7.70)**	(18.33)**	(11.30)**	(19.69)**	(11.30)**	(19.72)**
event==during				-0.048	-0.094	-0.057	-0.111
				(7.53)**	(17.48)**	(0.95)	(2.38)*
poldis*during						-0.034	-0.017
						(2.21)*	(1.39)
persuade*during						0.000	0.042
						(0.01)	(3.91)**
identity*during						-0.024	0.026
						(1.24)	(1.32)
newstv*during						0.082	0.009
						(1.26)	(0.19)
newspaper*during						-0.018	-0.018
						(0.76)	(1.04)
newsradio*during						0.011	0.016
						(0.51)	(0.96)
knowledge*during						0.001	0.054
						(0.40)	(4.96)**
Observations	13315	13671	41015	26986	54686	26986	54686

Robust z statistics in parentheses
* significant at 5%; ** significant at 1%

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Appendix 2.11: Interaction 2002a

	-1 'before'	-2 'during'	-3 'after'	-4 'before wrt during'	-5 'after wrt during'	-6 'before/during interaction'	-7 'after/during interaction'
Political discussion=yes	-0.036	-0.038	-0.047	-0.037	-0.043	-0.031	-0.047
	(5.29)**	(5.19)**	(7.60)**	(7.26)**	(9.07)**	(4.88)**	(7.84)**
Persuade Friends=yes	-0.027	-0.02	-0.011	-0.024	-0.016	-0.025	-0.005
	(4.44)**	(3.15)**	(2.19)*	(5.41)**	(3.86)**	(4.43)**	(1.04)
Knowledge EU (policy, institutions)	-0.078	-0.071	-0.048	-0.076	-0.058	-0.073	-0.05
	(12.14)**	(10.27)**	(8.52)**	(15.93)**	(13.10)**	(12.04)**	(8.92)**
European Parliament==tend to trust	-0.079	-0.075	-0.094	-0.079	-0.084	-0.078	-0.087
	(6.50)**	(5.75)**	(8.91)**	(8.72)**	(10.33)**	(6.74)**	(8.40)**
European Parliament==tend not to trust	0.092	0.059	0.065	0.08	0.064	0.086	0.07
	(6.49)**	(3.78)**	(5.14)**	(7.53)**	(6.56)**	(6.38)**	(5.60)**
European Comision==tend to trust	-0.08	-0.064	-0.068	-0.073	-0.066	-0.077	-0.071
	(6.85)**	(5.19)**	(6.84)**	(8.54)**	(8.65)**	(6.97)**	(7.31)**
European Comision==tend not to trust	0.036	0.065	0.042	0.048	0.051	0.036	0.035
	(2.72)**	(4.41)**	(3.52)**	(4.87)**	(5.51)**	(2.90)**	(2.98)**
European Central Bank==tend to trust	-0.108	-0.073	-0.093	-0.095	-0.085	-0.098	-0.095
	(12.27)**	(7.56)**	(12.35)**	(14.43)**	(14.25)**	(11.85)**	(12.81)**
European Central Bank==tend not to trust	0.081	0.081	0.084	0.081	0.082	0.078	0.081
	(7.84)**	(6.87)**	(9.02)**	(10.34)**	(11.31)**	(7.98)**	(8.84)**
gender==male	-0.078	-0.069	-0.06	-0.075	-0.064	-0.075	-0.064
	(12.35)**	(10.49)**	(11.12)**	(16.15)**	(15.21)**	(16.19)**	(15.24)**
couple==with couple	-0.017	-0.012	-0.024	-0.015	-0.02	-0.015	-0.02
	(2.78)**	(1.92)	(4.55)**	(3.38)**	(4.82)**	(3.40)**	(4.82)**
head==yes	0.011	-0.002	0.009	0.006	0.005	0.006	0.005
	(1.59)	(0.27)	(1.47)	(1.15)	(0.99)	(1.15)	(0.99)
edu	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008
	(12.45)**	(9.85)**	(13.80)**	(16.04)**	(16.62)**	(15.99)**	(16.61)**
age	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(6.33)**	(5.30)**	(7.24)**	(8.23)**	(8.92)**	(8.24)**	(8.93)**
country==france	-0.264	-0.184	-0.24	-0.232	-0.22	-0.232	-0.22
	(22.64)**	(16.05)**	(27.81)**	(27.76)**	(31.92)**	(27.74)**	(31.91)**
country==belgium	-0.311	-0.241	-0.278	-0.284	-0.265	-0.284	-0.265
	(28.72)**	(23.45)**	(35.87)**	(37.15)**	(42.82)**	(37.17)**	(42.81)**
country==holand	-0.225	-0.195	-0.18	-0.217	-0.187	-0.216	-0.187
	(17.37)**	(16.19)**	(17.38)**	(23.79)**	(23.69)**	(23.76)**	(23.68)**
country==germany	-0.186	-0.184	-0.217	-0.189	-0.205	-0.189	-0.205
	(15.52)**	(16.25)**	(23.81)**	(22.30)**	(28.81)**	(22.33)**	(28.84)**
country==italy	-0.341	-0.248	-0.246	-0.304	-0.247	-0.304	-0.247
	(32.17)**	(23.55)**	(28.97)**	(39.79)**	(37.54)**	(39.77)**	(37.54)**
country==luxembourg	-0.3	-0.247	-0.261	-0.281	-0.257	-0.281	-0.257
	(22.41)**	(20.63)**	(27.56)**	(30.49)**	(34.45)**	(30.50)**	(34.44)**
country==denmark	-0.028	-0.025	-0.105	-0.028	-0.075	-0.028	-0.075
	(1.87)	(1.66)	(8.99)**	(2.54)*	(8.07)**	(2.56)*	(8.10)**
country==ireland	-0.288	-0.232	-0.261	-0.268	-0.251	-0.268	-0.251
	(23.54)**	(21.26)**	(31.55)**	(31.65)**	(37.92)**	(31.65)**	(37.95)**
country==greece	-0.306	-0.245	-0.215	-0.283	-0.228	-0.283	-0.228
	(27.05)**	(24.48)**	(22.95)**	(36.40)**	(33.04)**	(36.40)**	(32.99)**
country==spain	-0.304	-0.243	-0.257	-0.282	-0.253	-0.282	-0.253
	(27.56)**	(24.42)**	(31.27)**	(36.81)**	(39.74)**	(36.82)**	(39.69)**
country==portugal	-0.273	-0.223	-0.251	-0.255	-0.241	-0.255	-0.241
	(22.45)**	(20.56)**	(29.88)**	(30.41)**	(36.16)**	(30.42)**	(36.13)**
country==finland	-0.106	-0.105	-0.217	-0.108	-0.179	-0.108	-0.179
	(7.65)**	(7.77)**	(23.45)**	(10.89)**	(23.10)**	(10.92)**	(23.14)**
country==sweden	0.015	-0.083	-0.067	-0.033	-0.075	-0.033	-0.075
	(0.94)	(5.88)**	(5.51)**	(3.02)**	(8.13)**	(3.01)**	(8.11)**
country==austria	-0.222	-0.215	-0.251	-0.225	-0.239	-0.225	-0.238
	(17.62)**	(19.62)**	(29.62)**	(26.09)**	(35.50)**	(26.10)**	(35.47)**
event==during				-0.078	-0.011	-0.079	-0.021
				(18.56)**	(2.77)**	(6.89)**	(2.04)*
poldis*during						-0.009	0.011
						(0.99)	(1.23)
persuade*during						0.005	-0.025
						(0.60)	(3.19)**
knowledge*during						0.001	-0.017
						(0.08)	(2.02)*
trust european parliament*during						0.007	0.008
						(0.41)	(0.48)
not to trust european parliament*during						-0.028	-0.019
						(1.27)	(0.91)
trust european comission*during						0.018	0.015
						(1.09)	(0.96)
not to trust european comission*during						0.027	0.004
						(1.32)	(2.01)
trust ECB*during						0.02	0.028
						(1.60)	(2.42)*
not to trust ECB*during						-0.001	0.002
						(0.08)	(0.14)
Observations	41848	28046	43302	69894	71348	69894	71348

Robust z statistics in parentheses

* significant at 5%; ** significant at 1%

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Appendix 2.12: Interaction 2002b

	-1 'before'	-2 'during'	-3 'after'	-4 'during wrt before'	-5 'during wrt after'	-6 'during/before interaction'	-7 'during/after interaction'
Political discussion=yes	-0.035	-0.017	-0.022	-0.022	-0.019	-0.025	-0.026
	(2.49)*	(2.08)*	(1.77)	(3.06)**	(2.84)**	(2.05)*	(2.29)*
Persuade Friends=yes	-0.022	-0.009	0.007	-0.013	-0.005	-0.021	0.018
	(1.85)	(1.30)	(0.64)	(2.12)*	(0.82)	(2.05)*	(1.83)
Knowledge EU (policy, institutions)	-0.046	-0.04	-0.032	-0.043	-0.036	-0.041	-0.029
	(3.48)**	(5.20)**	(2.78)**	(6.28)**	(5.65)**	(3.50)**	(2.73)**
European Parliament==tend to trust	-0.044	-0.074	-0.07	-0.066	-0.067	-0.04	-0.046
	(1.70)	(4.84)**	(3.18)**	(4.97)**	(5.32)**	(1.74)	(2.26)*
European Parliament==tend not to trust	0.11	0.042	0.092	0.063	0.065	0.098	0.104
	(3.80)**	(2.35)*	(3.63)**	(4.10)**	(4.46)**	(3.79)**	(4.32)**
European Comision==tend to trust	-0.082	-0.044	-0.072	-0.055	-0.054	-0.078	-0.077
	(3.49)**	(3.09)**	(3.55)**	(4.49)**	(4.65)**	(3.76)**	(4.05)**
European Comision==tend not to trust	0.022	0.055	0.04	0.045	0.047	0.016	0.013
	(0.87)	(3.34)**	(1.72)	(3.17)**	(3.45)**	(0.69)	(0.62)
European Central Bank==tend to trust	-0.086	-0.06	-0.098	-0.069	-0.073	-0.071	-0.1
	(4.60)**	(5.35)**	(6.25)**	(7.08)**	(8.06)**	(4.27)**	(6.90)**
European Central Bank==tend not to trust	0.048	0.078	0.072	0.068	0.073	0.048	0.059
	(2.28)*	(5.86)**	(3.92)**	(5.95)**	(6.80)**	(2.52)*	(3.48)**
Life satisfaction	-0.033	-0.09	-0.084	-0.074	-0.087	-0.032	-0.1
	(1.99)*	(9.03)**	(6.15)**	(8.58)**	(10.86)**	(2.24)*	(7.81)**
Press==tend to trust	0.001	-0.022	-0.015	-0.017	-0.017	-0.001	-0.015
	(0.06)	(2.52)*	(1.20)	(2.19)*	(2.41)*	(0.10)	(1.29)
Radio==tend to trust	-0.037	0.016	0.01	0.002	0.014	-0.032	0.004
	(1.89)	(1.52)	(0.63)	(0.16)	(1.56)	(1.83)	(0.31)
TV==tend to trust	0.036	0.026	0.017	0.028	0.023	0.035	0.002
	(1.95)	(2.65)**	(1.22)	(3.10)**	(2.81)**	(2.17)*	(0.14)
Political parties==tend to trust	-0.082	-0.041	-0.033	-0.054	-0.04	-0.071	-0.032
	(5.65)**	(5.02)**	(2.54)*	(7.38)**	(5.81)**	(5.67)**	(2.71)**
Identity pro european	-0.26	-0.217	-0.197	-0.232	-0.21	-0.233	-0.182
	(22.15)**	(30.60)**	(18.42)**	(37.53)**	(35.44)**	(22.51)**	(18.58)**
National Pride	0.013	-0.014	-0.003	-0.003	-0.011	0.008	0.005
	(0.72)	(1.23)	(0.14)	(0.30)	(1.17)	(0.53)	(0.33)
gender==male	-0.081	-0.061	-0.067	-0.068	-0.063	-0.068	-0.063
	(6.41)**	(8.32)**	(6.12)**	(10.43)**	(10.22)**	(10.44)**	(10.24)**
couple==with couple	-0.022	-0.003	-0.011	-0.008	-0.006	-0.009	-0.007
	(1.86)	(0.43)	(1.06)	(1.35)	(1.09)	(1.36)	(1.12)
head==yes	0.028	-0.011	0.012	0.001	-0.004	0.002	-0.004
	(2.04)*	(1.34)	(1.03)	(0.19)	(0.55)	(0.21)	(0.52)
edu	-0.006	-0.005	-0.007	-0.005	-0.005	-0.005	-0.005
	(4.22)**	(5.94)**	(6.11)**	(7.35)**	(8.14)**	(7.33)**	(8.09)**
age	0.001	0	0.001	0	0	0	0
	(2.40)*	(1.18)	(2.29)*	(2.33)*	(2.38)*	(2.38)*	(2.39)*
country==france	-0.253	-0.154	-0.247	-0.186	-0.189	-0.187	-0.187
	(10.30)**	(11.43)**	(12.81)**	(15.28)**	(17.01)**	(15.33)**	(16.81)**
country==belgium	-0.317	-0.224	-0.31	-0.256	-0.256	-0.256	-0.256
	(14.31)**	(19.25)**	(18.96)**	(24.02)**	(26.94)**	(24.09)**	(26.89)**
country==holand	-0.232	-0.175	-0.179	-0.196	-0.179	-0.196	-0.178
	(8.11)**	(12.47)**	(8.23)**	(14.91)**	(15.13)**	(14.88)**	(15.04)**
country==germany	-0.17	-0.162	-0.22	-0.169	-0.184	-0.169	-0.183
	(6.70)**	(12.45)**	(10.84)**	(14.02)**	(16.70)**	(14.02)**	(16.58)**
country==italy	-0.339	-0.225	-0.228	-0.263	-0.228	-0.263	-0.228
	(15.21)**	(17.43)**	(10.86)**	(23.31)**	(20.83)**	(23.24)**	(20.74)**
country==luxembourg	-0.272	-0.228	-0.271	-0.248	-0.245	-0.248	-0.244
	(8.13)**	(16.20)**	(12.62)**	(17.56)**	(20.75)**	(17.59)**	(20.66)**
country==denmark	-0.069	0.015	-0.105	-0.01	-0.026	-0.01	-0.025
	(2.35)*	(0.87)	(4.21)**	(0.62)	(1.78)	(0.63)	(1.69)
country==ireland	-0.31	-0.217	-0.298	-0.249	-0.247	-0.249	-0.246
	(13.25)**	(17.81)**	(17.07)**	(22.33)**	(24.58)**	(22.30)**	(24.50)**
country==greece	-0.345	-0.243	-0.208	-0.277	-0.238	-0.277	-0.237
	(15.81)**	(22.31)**	(9.96)**	(27.37)**	(23.92)**	(27.35)**	(23.76)**
country==spain	-0.26	-0.222	-0.244	-0.24	-0.232	-0.24	-0.231
	(10.28)**	(18.67)**	(12.15)**	(21.14)**	(22.36)**	(21.08)**	(22.31)**
country==portugal	-0.298	-0.212	-0.28	-0.242	-0.238	-0.242	-0.237
	(12.07)**	(17.09)**	(15.52)**	(20.89)**	(23.12)**	(20.98)**	(22.96)**
country==finland	-0.143	-0.103	-0.254	-0.118	-0.159	-0.118	-0.159
	(5.35)**	(6.90)**	(13.29)**	(8.80)**	(13.45)**	(8.77)**	(13.39)**
country==sweden	0.037	-0.078	-0.038	-0.051	-0.071	-0.052	-0.07
	(1.18)	(4.96)**	(1.47)	(3.48)**	(5.29)**	(3.50)**	(5.20)**
country==austria	-0.218	-0.199	-0.261	-0.212	-0.222	-0.212	-0.221
	(8.45)**	(16.06)**	(13.57)**	(18.02)**	(21.14)**	(18.03)**	(21.05)**
event==during				-0.115	-0.044	-0.083	-0.047
				(18.20)**	(7.55)**	(2.76)**	(1.71)
poldis*during						0.008	0.011
						(0.54)	(0.79)
persuade*during						0.015	-0.034
						(1.14)	(2.83)**
identity*during						0.035	-0.023
						(2.6)**	(1.85)
pride*during						-0.019	-0.024
						(0.94)	(1.24)
satisfaction*during						-0.055	0.026
						(3.00)**	(1.58)
knowledge*during						0.004	-0.009
						(0.27)	(0.68)
trust european parliament*during						-0.030	-0.030
						(1.01)	(1.15)
not to trust european parliament*during						-0.065	-0.071
						(1.90)	(2.24)*
trust european comission*during						0.044	0.042
						(1.64)	(1.74)
not to trust european comission*during						0.040	0.051
						(1.27)	(1.76)
trust ECB*during						0.014	0.050
						(0.67)	(2.71)**
not to trust ECB*during						0.024	0.019
						(0.93)	(0.84)
trust press*during						-0.020	-0.003
						(1.21)	(0.22)
trust radio*during						0.052	0.012
						(2.31)**	(0.67)
trust TV*duirng						-0.012	0.034
						(0.59)	(2.01)*
trust political parties*during						0.038	-0.009
						(2.41)**	(0.62)
Observations	11250	22774	11582	34024	34356	34024	34356

Robust z statistics in parentheses
* significant at 5%; ** significant at 1%

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Chapter 3: Does trust still matter? The causal effect of trust on social efficiency

3.1. Introduction

The relevance of trust in determining economic outcomes has received increasing importance during the last decades. The main idea is that trust, viewed as a propensity of people in a society to cooperate, makes possible the avoidance of social inefficiency. La Porta et al (1997), among others[16], shows that trust promotes cooperation, especially in large organizations. They collect indicators for government performance, participation in civic and professional societies, relative importance of large firms and social efficiency and they show, for the set of countries with information on trust available at the time, that trust significantly reduces social inefficiency.

In this chapter, I replicate the results of La Porta et al for a richer set of countries and updated information for economic outputs. The significant relevance of trust is observed when the sample under analysis is the same as in La Porta, but the effect disappears for many of the indicators of social efficiency when using the larger set of countries. The original set of countries available for La Porta was biased through the more developed/western countries. In fact, separate regressions for the additional set of countries (mainly African and Asian) do not show any significant role of trust. I introduce a more homogeneous country sampling based on the Human Developing Indicators ranking from the World Bank, 2008. The two groups correspond to High Human Developed (HHD) and Medium Human Developed (MHD) countries. Strikingly, the results show no significant effect of trust for most of the indicators in both groups of countries. The sensitivity of the

[16] See Knack (2001) for a literature review and Mouw (2006) for a review of recent research estimating the causal effect of Social Capital and Trust.

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estimated coefficients to the sampling decision should call into question the conclusions of previous research.

More relevant than the sampling sensitivity mentioned above, the main problem when estimating the effect of trust on social efficiency lies in the weak specification of the relevant causal relationship. It is true that trust could facilitate cooperation and then, social efficiency but it is also true that the observed social efficient institutions could be what make people trust others. To solve this reversed-causality problem, which makes the estimated coefficients spurious in Ordinary Least Square (OLS) regressions, I introduce an innovative set of instruments for trust from the area of neuroeconomics. There are experimental studies showing that oxytocin facilitates trusting behavior in humans (Kosfeld et al, 2005; Baumgartner et al, 2008). If international data on hormones levels were available, then oxytocin levels could be a good candidate for explaining society-wide trust levels. Oxytocin facilitates trust but it seems less probable that oxytocin could directly affect cooperation in large organizations, i.e. oxytocin correlates with trust but it is uncorrelated with the stochastic part of the social efficiency variables. Due to the lack of international hormone data, Zak and Fakhar (2006) collects data of variables correlated with oxytocin (biological, social and environmental factors associated with the hormone's level) to get a proxy of oxytocin level by country. The authors extract three orthogonal factors that explain 70% of the variation on trust in their sample of countries. I reconstruct these factors for the updated data set and additional variables correlated to oxytocin. The findings support the relevance of trust causing social efficiency: for the sample of High and Medium Human Developed countries, robustness is recovered for most of the social indicators. Further, the effect of trust on social efficiency indicators more than doubled with respect to previous estimations, indicating the underestimation of previous results.

The chapter is organized as follows. Section 3.2 shows the data used and the main differences with respect to the set available in La Porta et al (1997). It also shows the instrument for trust used in the following section. Section 3.3 estimates the role of trust for large organizations, using both OLS and IV, and highlights the selection bias that drives the results in La Porta et al. Section 3.4 concludes.

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3.2. The data

Trust and Performance of Large Organizations

The main purpose of this chapter is to get the effect of trust on the performance of large organizations. Following La Porta et al, the performance of large organizations is measured by government effectiveness, participation in civic organizations, size of the largest firms relative to GDP and the performance of society in general terms. The measure of trust comes from the second (1989-1993) and fourth (1999-2004) waves of the World Value Survey (WVS). The second wave covers data for 42 countries, the sample available for La Porta et al. The fourth wave covers 69 countries. Trust by country is defined as the proportion of people declaring "Generally speaking, I would say that most people can be trusted". The correlation between the two measures of trust from WVS2 and WVS4 is high and statistically significant (the coefficient of correlation is 0.86 for the 38 countries in common).

Table 3.1 describes the variables measuring performance of large organizations. As La Porta et al specifies, for *government effectiveness* updated (subjective) estimates of the corruption, bureaucracy quality and tax compliance (a proxy for effectiveness of the tax authority)[17] in each country are used from investor surveys. For *participation* the same updated variables were included; participation in civic activities and in professional associations from the WVS. For *large organizations,* the relative success of large firms is constructed as *sales* over GDP, using the Forbes Global 2000 indicator. It basically selects, for a defined threshold, the biggest firms publicly listed around the world and then classifies them by country. This measure is different from the one used by La Porta because it considers only firms that are classified worldwide as "big companies", not the 20 biggest firms by country. Therefore, the measure used here makes the differences across countries more realistic in terms of worldwide presence of large organizations.

[17] It was not possible to include in the updated data a measure for efficiency of the judicial system in the present study.

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Table 3.1: Description of the Variables, compared to La Porta (1998)

Variable	La Porta et al (1998)	Present study
Trust in people	Percentage of respondents who answered that most people can be trusted when asked: "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?" Source: World Values Survey 1990-93 (WVS).	Percentage of respondents who answered that most people can be trusted when asked: "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?" Source: World Values Survey 1989/1993 (WVS 2) and 1999/2004 (WVS 4)
Corruption	Low ratings if "high government officials are likely to demand special payments and illegal payments are generally expected throughout lower levels of government in the form of bribes connected with import and export licenses, exchange controls, tax assessment, policy protection, or loans." Scale from 0 to 10. Average of the months of April and October of the monthly index between 1982 and 1995. Source: International Country Risk Guide (ICRG).	Low ratings if "high government officials are likely to demand special payments and illegal payments are generally expected throughout lower levels of government in the form of bribes connected with import and export licenses, exchange controls, tax assessment, policy protection, or loans." Scale from 0 to 6. Value for July 2008. Source: International Country Risk Guide (ICRG).
Bureaucratic Quality	High scores indicate "autonomy from political pressure" and "strength and expertise to govern without drastic changes in policy or interruptions in government services." Scale from 0 to 10, with higher scores for greater efficiency. Average of the months of April and October of the monthly index between 1982 and 1995. Source: ICRG	High scores indicate "autonomy from political pressure" and "strength and expertise to govern without drastic changes in policy or interruptions in government services." Scale from 0 to 4, with higher scores for greater efficiency. Value for July 2008. Source: International Country Risk Guide (ICRG).
Tax compliance	Assessment of the level of tax compliance. Scale from 0 to 6, where higher scores indicate higher compliance. Source: The Global Competitivenies Report 1996 (GCR).	Assessment of the level of tax compliance. Scale from 0 to 7, where higher scores indicate higher compliance. Source: The Global Competitiveniess Report 2007/2008 (GCR).
Civic participation	Percentage of civic activities in which an average individual participates. The activities included are: (i) social-welfare services for elderly and deprived, (ii) education, art, and cultural activities, (iii) local community affairs, (iv) conservation, environment, ecology, (v) work with youth, (vi) sports or recreation, and (vii) voluntary associations for health. Source: WVS	Percentage of civic activities in which an average individual participates. The activities included are: (i) social-welfare services for elderly and deprived, (ii) education, art, and cultural activities, (iii) local community affairs, (iv) conservation, environment, ecology, (v) work with youth, (vi) sports or recreation, and (vii) voluntary associations for health. Source: WVS 2 and WVS 4.
Participation in Professional Associations	Participation in Percentage of respondents who answered positively professional when asked if they belonged to professional associations associations. Source: WVS	Participation in Percentage of respondents who answered positively professional when asked if they belonged to professional associations associations. Source: WVS 2 and WVS 4.
Sales' top 20/GNP	The ratio of sales generated by the top 20 publicly traded firms to GNP for 1994. Firms within a country are ranked by sales. Source: WorldScope Global 1996 data base	The ratio of sales generated by the Forbes Global 2000 publicly traded firms as of Feb 27 2009, to GDP for 2005. Firms within a country are ranked by sales. Source: Forbes Global 2000, April 2009.
Adequacy of Infrastructure	Average of five scores measuring the extent to which a country's infrastructure meets business needs in each of the following areas: (i) roads, (ii) air transport, (iii) ports, (iv) telecommunications, and (v) power supply. Scale from 0 to 6, where higher score's are for a superior infrastructure. Source: GCR.	Average of five scores measuring the extent to which a country's infrastructure meets business needs in each of the following areas: (i) roads, (ii) air transport, (iii) ports, (iv) telecommunications, and (v) power supply. Scale from 0 to 7, where higher score's are for a superior infrastructure. Source: GCR 2007/2008.
Log of Infant Mortality	Logarithm of the number of deaths of infants under one year of age per one thousand live births for 1993 or the most recent year available. Source: Health-For-All Global Indicators Database	Logarithm of the number of deaths of infants under one year of age per one thousand live births for 2005 or the most recent year available. Source: Human Development Report (HDR), 2007/2008.
Completed High School	Percentage of the 1985 male population aged 25 and over that has completed high school. Source: Robert Barro and Jong-Wha Lee (1994).	School enrollment, tertiary (% gross) World Bank on-line data set, 1991-2006.
Adequacy of Educational System	Assessment of the extent to which the educational system meets the needs of a competitive economy. system Score from 0 to 6, where higher scores are for a superior educational system. Source: GCR	Assessment of the extent to which the educational system meets the needs of a competitive economy. system Score from 0 to 7, where higher scores are for a superior educational system. Source: GCR 2007/2008.
Log inflation	Logarithm of the geometric average annual growth rate of the implicit price deflator for the time period 1970-1993. Source: World Development Report 1995 (WDR95).	Logarithm of the average annual growth rate of the ICP for the time period 1990-2005. Source: HDR 2007/2008..
GDP growth	Average annual growth in per capita GDP for the period 1970-1993. Source: WDR95.	Average annual growth in per capita GDP for the period 1990-2005. Source: HDR 2007/2008.
Log GNP per capita	Logarithm of the GNP per capita expressed in dollars capita of 1994 unless otherwise noted. Source: World Developmnent Report 1996.	Logarithm of the GNI per capita, PPP expressed in current international dollars. Source: World Bank on-line data set, 2005.
Trust in family	Rating based on respondents' answers to how much they trust their families. Scale from 0 to 4. The highest (lowest) rating is awarded when respondents manifest that they trust (distrust) their families. Source: WVS.	Percentage of respondents who answered that family can be trusted (a little or completely) when asked: "How much do you trust your family?" Source: WVS 2 and WVS 4.
Hierarchical religion	Percentage of the population of each country that are religion Roman Catholic, Eastem Orthodox, or Muslim. Sources: Worldmark Encyclopedia of the Nations 1995, Statistical Abstract of the World 1994.	Percentage of the population of each country that are religion Roman Catholic, Eastem Orthodox, or Muslim. Sources: WVS 2 and WVS 4.

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Finally, the variables reflecting *social efficiency* are related to the effectiveness of the government and other institutions in society as well (inflation, GDP growth, infant mortality rate, rate of enrollment in tertiary education, adequacy of infrastructure and adequacy of educational system). They come from the same sources as La Porta, except by "Completed high school". In the present study, a measure of the percentage of population enrolled in tertiary education is included, taken from the World Bank Indicators.

The set used by La Porta seems to have a "selection/availability" bias through European countries (see appendix 3.1 for the list of countries in each sample). As can be seen in Table 3.2, more than 35% of the additional countries, with respect to La Porta, are Asian showing the under representation of these countries in the original sample. Overall, the additional countries are poorer both in GDP and GDP per capita, show smaller degrees of trust, worse indices for adequacy of infrastructure and adequacy of educational system, higher levels of corruption and more than doubled infant mortality rate. Overall, the original sample used by La Porta and the richer sample available for this study are not equivalent and the conclusions derived by La Porta should take into account this evident problem. La Porta briefly justifies the sample used by commenting about the lack of data for Eastern European countries. There is no mention about the under representation of African and Asian countries.

I introduce a sampling based on the Human Development Index (HDI), World Bank 2008. HDI is a composite statistic used as an index/glossary to rank countries by level of "human development" and separate developed (high development), developing (middle development), and underdeveloped (low development) countries. The statistic is composed from statistics for Life Expectancy, Education, Standard of living and GDP collected at national level. Given the data available, I have 43 countries qualifying as High Human Developed (HHD), 21 as Medium Human Developed (MHD) and 2 as Low Human Developed (LHD). I decided to include Tanzania and Nigeria, the two LHD countries, into the sample of MHD in what follows, given they are very close in the ranking (see appendix 3.2 for the list of countries in each group).

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Table 3.2: Summary statistics for sample of countries common to La Porta (1998), the additional countries available in the present study and the whole sample.

Variable	Common countries		Additional countries		Whole sample	
	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*
Trust (proportion people that trust)	0.31	*0.15*	0.25	*0.15*	0.28	*0.15*
Corruption (higher means less corrupted)	3.37	*1.23*	2.50	*1.09*	2.98	*1.26*
Bureaucracy Quality (the higher the better)	2.97	*0.95*	2.22	*0.89*	2.65	*0.99*
GDP 2005 (billions US dollars)	969	*2113*	87	*86*	614	*1687*
GDP percapita 2005 (US dollars)	20187	*16218*	7492	*16006*	14811	*17268*
Inflation 1990-2005 (%)	15.62	*27.98*	13.03	*15.01*	15.15	*23.65*
Tax Compliance (higher indicated higher compliance)	3.39	*0.86*	3.66	*0.89*	3.44	*0.83*
Adequacy of Infrastructure (the higher the better)	4.79	*1.15*	3.60	*1.02*	4.24	*1.22*
Adequacy of Educational System (the higher the better)	4.33	*0.98*	3.44	*0.84*	3.94	*0.98*
Infant Mortality Rate 2005 (over 1000 live births)	12.38	*18.85*	27.73	*24.83*	19.72	*23.07*
Sales biggest firms/GDP	0.43	*0.43*	0.31	*0.96*	0.36	*0.69*
N	39		27		66	
European	67%		33%		53%	
African	5%		22%		12%	
American	13%		7%		11%	
Asian	15%		37%		25%	

Table 3.3 reports summary statistics for HHD and MHD countries. At first sight, we observe better average indicators for HHD in comparison to MHD, in line with the intuition. The standard deviation for most of the indicators is smaller than the sampling shown in table 3.2. This is consistent with the more homogeneous sampling intention.

Table 3.3: Summary statistics for High Human Developed and Medium & Low Human Developed countries.

Variable	High Human Developed		Medium and Low Human Develop.		Whole sample	
	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*
Trust (proportion people that trust)	0.30	*0.14*	0.25	*0.16*	0.28	*0.15*
Corruption (higher means less corrupted)	3.40	*1.26*	2.20	*0.81*	2.98	*1.26*
Bureaucracy Quality (the higher the better)	3.10	*0.89*	1.84	*0.56*	2.65	*0.99*
GDP 2005 (billions US dollars)	828	*2047*	223	*472*	614	*1687*
GDP percapita 2005 (US dollars)	21954	*17788*	1768	*1580*	14811	*17268*
Inflation 1990-2005 (%)	14.12	*26.59*	16.98	*17.62*	15.15	*23.65*
Tax Compliance (higher indicated higher compliance)	3.42	*0.89*	3.49	*0.71*	3.44	*0.83*
Adequacy of Infrastructure (the higher the better)	4.75	*1.17*	3.34	*0.65*	4.24	*1.22*
Adequacy of Educational System (the higher the better)	4.27	*0.96*	3.33	*0.69*	3.94	*0.98*
Infant Mortality Rate 2005 (over 1000 live births)	7.31	*5.09*	42.39	*25.85*	19.72	*23.07*
Sales biggest firms/GDP	0.49	*0.82*	0.11	*0.16*	0.36	*0.69*
N	43		23		66	
European	9%		76%		53%	
African	34%		0%		12%	
American	9%		12%		11%	
Asian	48%		12%		24%	

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Instruments for Trust

The key problem estimating the effect of trust on social efficiency indicators is the potential reverse-causality: trust facilitates cooperation and diminishes inefficiencies but also it could be that these more efficient institutions create the environment for people to trust. Technically, trust correlates with the stochastic part of the social indicators we want to explain, making the estimated coefficient for trust spurious.

Mouw (2008) examines recent attempts to estimate the causal effect of social capital and trust. One of the possible solutions is to find an IV (instrumental variable) that is correlated with the independent variable of interest but not with unobserved factors. I introduce here a set of instruments from the area of neuroeconomics, proposed by Zak and Fakhar (2006). Experimental research shows that oxytocin facilitates trusting behavior in humans (Kosfeld et al, 2005; Baumgartner et al, 2008). Following the methodology of Zak and Fakhar, I construct a set of instruments that attempt to measure country oxytocin levels. This set of instruments should correlate with trust but not with the unobserved factors of the social indicators we want to explain.

La Porta et al instrument regressions using a measure of hierarchical religion. According to Putman (1993), trust is a habit formed during a centuries-long history of "horizontal networks association" between people. The author argues that the imposition of hierarchical structures on the society has discouraged the formation of trust. La Porta identifies the percentage of population belonging to a hierarchical religion (defined as Catholic, Muslim or Orthodox) by country. The first stage regression (trust on hierarchical religion and log of per capita Gross National Income) for the original sample in La Porta explains around 42% of the variation in trust, with estimated coefficient for hierarchical religion negative, high and statistically significant. For the set of High Human Developed countries, the first stage regression explains 44% of the variation of trust also with negative and statistically significant estimated coefficient. However, hierarchical religion does not have any explanatory power for the Medium Human Developed set of countries

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weakening the theoretical argument of Putman, at least for less developed countries. Therefore, the introduction of the instruments for trust coming from the area of neuroeconomics becomes more attractive.

Recent neuroeconomics experiments with humans have demonstrated that trust between two random individuals is facilitated by oxytocin (Kosfeld et al, 2005; Baumgartner et al, 2008). It has also been showed that an increase in oxytocin level is associated with trustworthy behavior (Zak et al, 2004). Therefore, if we could measure the level of oxytocin by country it would be expected to qualify as good instrument for trust.

I will briefly describe the experiments above in order to more easily understand how oxytocin operates in causing trusting behavior. It is important to know that oxytocin is synthesized in the brain (specifically, paraventricular nucleus and the supraoptic nucleus of the hypothalamus). One of its functions in the central system is to act as a neuromodulator; an endogenous chemical which relays, amplifies and modulates signals between a neuron and another cell. It does this through the process of receptor binding to a neuroreceptor, which triggers a response in the neuron to alter its functioning. The olfactory bulb has a collection of oxytocin receptors, which is crucial for experiment's design. The experiment consists of two individuals (*the investors* and *the trustee*) interacting anonymously in a trust game with real monetary stakes. The investor is given an initial endowment which he can keep or invest. Investment here is represented by a costly trusting action. If the investor transfers money to the trustee, the amount transferred triples. The trustee is informed about the investor's transfer and then he has to decide to honor the investor's trust by sharing the monetary increase generated by the investor's transfer. Before starting the game, half of the sample of individuals where randomly administrated a single dose of intranasal oxytocin (treatment group) and the other half a placebo (control group). The results show that investors in the treatment group exhibited higher money transfers than those in the control group.

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Table 3.3: Description of the input variables for neuroactive hormone instruments, compared to Zak and Fakhar (2006).

Variable	Zak and Fakhar (2006)	Present study
Trust in people	Percentage of respondents who answered that most people can be trusted when asked: "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?" Source: World Values Survey 1995-96 (WVS 3).	Percentage of respondents who answered that most people can be trusted when asked: "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?" Source: World Values Survey 1994/1999 (WVS 3) and 1999/2004 (WVS 4)
Per capita Income	real income per capita in international prices, 1985. Source: Summers and Heston, 1991.	GNI per capita, PPP expressed in thouisand current international dollars. Source: World Bank on-line data set, 1990-2005
Biological processes		
Total breastfeeding	percent of breastfed infants.Exclusive breastfeeding rate (<4 months) + time complementary breastfeeding rate (6–9 months) + continued breastfeeding rate (12–15 months) + continued breastfeeding rate (20–23 months). Source: Breastfeeding indicators, UNICEF Global database.	percent of breastfed infants.Exclusive breastfeeding rate (<4 months) + time complementary breastfeeding rate (6–9 months) + continued breastfeeding rate (12–15 months) + continued breastfeeding rate (20–23 months). Source: Breastfeeding indicators, UNICEF Global database.
Fertility Rate	total births per woman. Source: World Development Indicators database, World Bank, 1990.	total births per woman. Source: World Development Indicators database, World Bank, Average 1989-1993 and 1999-2004.
Female population	percentage of total population. Source: World Development Indicators database, World Bank, 1990.	percentage of total population. Source: World Development Indicators database, World Bank, Average 1989-1993 and 1999-2004.
Sex frequency	respondents from the Global Sex Survey 2002 answering the question: ''How often do you have sex''. Source: Durex Global Survey.	respondents from the Global Sex Survey 2007. % of population that has sex weekly or more. Source: Durex Global Survey.
Social interaction		
Ownership	households in occupied housing units, % owner. Source: United Nations, Human Settlement Statistics Questionnaire 1999.	Not available
Rural population	percentage of the total population. Source: World Development Indicators database, World Bank, 1990	percentage of the total population. Source: World Development Indicators database, World Bank, Average 1989-1993 and 1999-2004.
Religion Variables	International Social Survey Programme. Source: http://www.issp.org/	Percentage of the population of each country. Source: CIA World Factbook, 2006.
Thelephone usage	mainlines per 1000 population. Source: World Bank: World Development Indicators	Fixed line and mobile phone subscribers (per 100 people). Source: World Development Indicators database, World Bank, Average 1989-1993 and 1999-2004.
Internet Users		Internet users (per 100 people). Source: World Development Indicators database, World Bank, Average 1989-1993 and 1999-2004.
Density	population per square mile Source: Population Reference Bureau, 1996, World Population Data, United Nations Population Division.	Population density (people per sq. km). Source: World Development Indicators database, World Bank, Average 1989-1993 and 1999-2004.
Exposure to estrogen-like molecules in the enviroment		
Distance from the Equator	in degrees and minutes, of various major cities around the world. Source: http://geography.about.com/gi/dynamic/offsite.htm?once=true&site=http://www.bcca.org/misc/qiblih/latlong.htm	in degrees and minutes, of various major cities around the world. Source: http://www.maxmind.com/app/country_latlon, CIA World Factbook
Biodiversity	nationally protected area (% of land protected). Source: The Little Green Data Book, 2001, World Bank Indicators	nationally protected area (% of land protected). Source: World Development Indicators database, World Bank, 2004
Water Pollution	emissions of organic water pollutants: (kgs per day per worker 1998) * 360 Emissions of organic water pollutants are measured in terms of biochemical oxygen demand (the amount of oxygen that bacteria in water will consume in breaking down waste). Source: World Development Indicators, Table 3.6. World Bank	Organic water pollutant (BOD) emissions (kg per day per worker). Emissions of organic water pollutants are measured in terms of biochemical oxygen demand (the amount of oxygen that bacteria in water will consume in breaking down waste). Source: World Development Indicators database, World Bank, Average 1989-1993 and 1999-2004.
Air Pollution	three types: (Metric tonnes per capita) Airp1: total suspended particulates refer to smoke, soot, dust, and liquid droplets from combustion.	CO2 emissions (metric tons per capita)
	Airp2: sulfur dioxide (SO2) is an air pollutant produced when fossil fuels containing sulfur are burned. Airp3: nitrogen dioxide (NO2) is a poisonous, pungent gas formed when nitric oxide combines with hydrocarbons and sunlight.	Nitrous oxide emissions (thousand metric tons of CO2 equivalent) Other greenhouse gas emissions, HFC, PFC and SF6 (thousand metric tons of CO2 equivalent)
	Source: 1998 World Development Indicators, World Bank	Source: World Development Indicators database, World Bank, Average 1989-1993 and 1999-2004.
Phytoestrogen Consumption	dietary intake of phytoestrogens (ug/day) * 360 based on the questionnaire in selected population.	dietary intake of phytoestrogens (ug/day) * 365 based on the questionnaire in selected population.
	Food types: (1) peas, dry; (2) beans, dry; (3) infant food; (4) rye: rye, flour rye, bran rye; (5) bovine meat: beef veal, beef boneless, beef dried salted and smoked, meat extracts, sausage beef, beef preparations, beef canned, meat homogenized, buffalo meat; (6) soybeans and products: soybeans, soya sauce, soya paste, soya curd; (7) spices: vanilla, cinnamon, nutmeg, anise, ginger, spices; (8) tea: tea, extract tea, mate. Source: Food and Agriculture Organization of the United Nations.	Food types: (1) Legumes: peas, beans, pulses and other pulses; (2) Nuts & Oil Seeds: nuts and products, sesame seed; (3) Vegetables: olive oil, tomamtoes, vegetables, other vegetables & products, olives; (4) Fruits: dates, oranges, grapes, apples, banana, grapefruit; (5) Cereals and Bread: rye, wheat, rice (6) Soya products: soya beans and products (7) Beverage, no alcoholic: coffee and products, tea (8) Beverage, alcohol: wine, barely beer. Source: Food and Agriculture Organization of the United Nations. Average 1989-1993 and 1999-2004.

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Given that international data on hormones levels are unavailable, Zak and Fakhar (2006) provides evidence showing that oxytocin levels are related to international levels of generalized trust. They collect data for three areas that are expected to be correlated with oxytocin and estrogen[18] levels: biological processes that directly impact oxytocin, the exposure to estrogen-like molecules in the environment and frequency of social interactions. The authors discuss previous research showing that oxytocin appears to stimulate, and be stimulated by, positive social interactions. It has been empirically shown that oxytocin increases when a person receives an intentional trust signal (Zak et al, 2004), which is more probable to happen in more social interactive environments.

The authors use factor analysis as a reduction method to capture the common variance between the sets of variables theoretically correlated with oxytocin. Many of the variables are highly correlated. Therefore, simultaneously testing all of them would give a spurious result. Further, each variable imperfectly reflects oxytocin or estrogens levels, which also prevents us from carrying out a one-by-one examination.

The authors extract three orthogonal factors that together explain 70% of the variation in trust. Table 3.3 shows the associated variables used to construct the factors, a brief description and sources. A first problem presents itself when collecting some of the variables used. Information for *Sex Frequency* and *Breast Feeding* is not available for an important set of countries in their sample (Sex frequency is available only for 18 countries and breast feeding for 16, for a sample size of 39 countries[19]). *Ownership* was not included because of source accessibility. Finally, and most importantly, some doubts arise with respect to the collection of the percentage of phytoestrogens in food. The authors collected the information from a variety of sources, not homogeneous relative to the

[18] "Animal studies indicate that estrogens facilitates oxytocin uptake by increasing receptor binding and expanding the number of oxytocin receptors (Verbalis, 1999)" Zak and Fakhar (2006).

[19] The original sample of Zak was 41 countries available in the WVS3 and WVS2. In this study, the WVS3 used is an updated version corrected by the official source in 2006, after reported mistakes in the original version. As a consequence, data for New Zealand and Taiwan are not included in the present study. For details about the replication of Zak methodology, see Appendix 3.3.

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scientific method to measure the content of phytoestrogens in food. In a recent work, Schwartz, Sontag and Plumb (2009) presents an inventory of phytoestrogens datasets, concluding that nowadays there is better and more accurate information than available for Zak. I select a recent study that uses the same method for a wider variety of foods (Thompson, Boucher, Liu, Cotterchio and Kreiger, 2006). The phytoestrogens measured in this study are: Isoflavones (formononetin, daidzein, genistein, glycitein), Coumestans (courmestrol) and Lignans (matairesinol, lariciresinol, pinoresinol, secoisolariciresinol). Finally, *Telephone usage* now also includes mobiles and a measure of *Internet users* was included as an extra social interaction variable.

A detailed replication of the Zak methodology can be seen in Appendix 3.3. For the same set of countries as Zak (N=39) but for the updated data set (i.e. 1999-2004), the methodology generates three factors that explain 42% of the variation in trust (together with GNI per capita). For the High Human Developed countries, the first stage regression explains 60% of the trust variation; for the Medium Human Developed set of countries, 50%. Overall, the factors extracted seem to qualify as good instruments for trust, invariant to the sampling decisions.

Table 3.4 shows the rotated loading factor matrix (Varimax rotation with Kaiser normalization) after factor analysis for the 24 hormone-correlate variables included in this study, for the two groups of countries: High Human Developed and Medium Human Developed. Factor assignments were made based on the largest loadings.

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Table 3.4: Rotated factor matrix.

	Extracted Factors					
	High Human Developed			Medium Human Developed		
	f1	*f2*	*f3*	*f1*	*f2*	*f3*
Biological						0.42
Fertility rate	0.41					
Female population	-0.47				0.34	
Social Interaction						
Internet usage			0.85		0.77	
Fixed and mobile phones			0.81		0.69	
Rural population			-0.55		-0.70	
Density		0.35			-0.58	
Muslims	0.46				-0.39	
Catholics			-0.42	-0.43		
Buddhists		0.93		0.31		-0.43
Jews	0.58					
Hindus			0.34		-0.42	
Protestants			0.71		0.55	
Estrogens-like molecules in the enviroment						
Latitud			0.33	0.69		
Water pollution		-0.28		-0.17		
Protected land areas			0.45		0.43	
CO2 emissions			0.67		0.80	
Matairesinol	0.87			0.93		
Lariciresinol	0.94			0.97		
Pinoresinol	0.91			0.71		
Secoisolariciresinol	0.40			0.93		
Courmestrol	0.63			0.43		
Formononetin	0.79			0.93		
Daidzein		0.97				0.84
Genistein		0.97				0.83
Glycetin		0.97				0.88

Extraction Method: Factor Analysis. Rotation: Varimax with Kaiser Normalization.

Most of the loading factors support the intuition. One of the exceptions is the female population for HHD countries, which does not seem to have a positive relation to oxytocin. Religious association has negative loadings for most hierarchical classes in MHD countries in contrast to the positive effect for HHD countries. Notice the similarity among variables loaded in each factor across samples: two of them mainly loading phytoestrogens and the one left, social interaction.

The first, second and third factors for the HHD countries account for 25%, 18% and 14%, respectively, of the overall inter-country variance among the 24 hormone-correlate variables included in the analysis. In the sample of MHD countries, these magnitudes are 25%, 18% and 12%.

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There are two factors in each sample mainly related to the dietary intake of phytoestrogens. In general, the majority of phytoestrogens belong to a large group known as flavoids (isoflavones, coumestans and prenyl flavonoids). They possess the most potent known oestrogenic activity. A class of non-flavonoids, the lignans, has also been identified. Even though they are not thought to be oestrogenics themselves, they are converted to oestrogenic compounds by the gut microflora (Bakker, 2004). As can be see here, the first factor in each sample collects mainly lignans loading. The second factor for HHD and the third factor for MHD collect isoflavones. Therefore, I will call them *lignan-factor* and *isoflavon-factor*, respectively. The left factor has mainly social and environmental loading reason so it is referred to as *eco-social-factor* in what follows.

The first stage OLS regression of trust on these three factors, with the logarithm of GNI per capita as a covariate control, explains 60% of the variation in trust for the HHD sample. The *eco-social* factor is positively and statistically significantly related to trust (p=0.000, t-test). The *lignan* and *isoflavon* factors have non-different from zero effects on trust (p=0.9 and p=0.2, t-test). In the case of MHD countries, the first stage regression explains 50% of the variation in trust. The *eco-social* factor is negatively and statistically significantly related to trust (p=0.01, t-test). The *isoflavon-social* factor is positively and statistically significantly related to trust (p=0.03, t-test). Finally, the *lignan-factor* has non-different from zero effect on trust (p=0.46, t-test).

Therefore, it seems that the dietary intake of isoflavones is more relevant in accounting for oxytocin levels in MHD countries than in HHD countries. Results also interestingly demonstrate the negative effect on trust coming from the eco-social factor in MHD countries, which could reflect the worse quality of social interaction in less developed countries.

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3.3. Regression analysis, the role of trust.

In what follows, I will test the hypothesis that trust affects the performance of large organizations, measured by government effectiveness, participation in civic and professional associations, size or large firms relative to GDP and the performance of society in general terms, following La Porta et al (1997). The causal effect of trust on social efficiency indicators is estimated using Neuroactive Hormone Factors as instruments for trust. The samples analyzed correspond to High Human Developed (HHD) and Medium Human Developed (MHD) countries.

Table 3.5 shows the original OLS regressions from la Porta et al and the regressions using the updated data for the same sample as La Porta. The different measures of performance of large organizations are regressed on trust, controlling for the log of 2005 per capita GDP. To interpret the coefficients, we use a one standard deviation change in trust (approximately 0.15 percentage points) holding GPD per capita constant. The similarity of the results is remarkable. Corruption decreases by 0.4 of a standard deviation[20] and the index for bureaucracy quality improves by 0.3 of a standard deviation, the same as in La Porta. Participation in civic and professional associations increases a bit less than in La Porta (0.5 and 0.4 of a standard deviation compared to 0.7 and 1.0 standard deviation). The result for Sales of biggest firms/GDP is quite similar (0.3 of a standard deviation compared to 0.5), whereas my results are higher for Adequacy of Infrastructure and Educational System. Even though the coefficients for Tax Compliance, Log Infant Mortality Rate, Enrollment in Tertiary Education and GDP growth have theoretically consistent signs, they are not statistically significant different from zero.

The results above are not robust to sampling decisions. Table 3.6 shows OLS regressions for HHD and MHD countries. For the HHD sample only three specifications show a statistically significant role of trust: civic participation, participation in professional associations and adequacy of educational system. In the case of MHD countries, only one

[20] Higher scores means less corruption.

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of the Government Efficiency variables and three out of six indicators in the category of social efficiency display significance.

Table 3.5: Comparison of OLS regressions, sample of countries available for La Porta et al.

La Porta et al (1998)

Dependent Variable	Government Efficiency			Participation		Large Organizations	Social efficiency					
Independent Vars.	Corruption	Bureaucracy Quality	Tax Compliance	Civic Participation	Participation in Profesional Associations	Sales Biggest Firms/GDP	Adequacy of Infrastructure	Log Infant Mortality	Completed High School	Adequacy of Educational System	Log Inflation	GDP Growth
Log GNP per capita 1994	0.9214	1.1596	0.3595	0.0127	-0.0072	0.0103	0.5943	-0.4598	1.2884	0.2200	0.0371	-0.2738
	(0.10)***	(0.19)***	(0.09)***	(0.00)***	(0.01)	(0.03)	(0.06)***	(0.05)***	(0.44)***	(0.09)***	(0.08)	(0.15)*
Trust in people	4.8068	3.9797	1.733	0.1224	0.3056	0.4927	1.2511	-1.0283	10.9714	1.2334	-3.4128	2.0266
	(0.71)***	(1.35)***	(0.58)***	(0.03)***	(0.07)***	(0.17)***	(0.42)***	(0.52)**	(3.46)***	(0.68)**	(1.15)***	(1.22)*
Constant	-2.3608	-4.0842	-0.9124	-0.0921	0.033	-0.0374	-1.6559	6.9682	-7.4405	0.8525	3.1306	3.5847
	(0.90)***	(1.6763)**	(0.78)	(0.03)***	(0.07)	(0.28)	(0.58)***	(0.45)***	(3.53)**	(0.77)	(0.65)***	(1.36)***
Observations	33	33	32	33	33	26	32	40	29	32	37	39
Adjusted R-squared	0.7316	0.6806	0.354	0.4614	0.5492	0.2433	0.7222	0.7141	0.3474	0.2107	0.2059	0.0072
Halbert White (1980) corrected standard errors in parentheses												

Present study, same sample of country than La Porta et al.

Dependent Variable	Government Efficiency			Participation		Large Organizations	Social efficiency					
Independent Vars.	Corruption	Bureaucracy Quality	Tax Compliance	Civic Participation	Participation in Profesional Associations	Sales Biggest Firms/GDP	Adequacy of Infrastructure	Log Infant Mortality	Enrollment in Tertiary Education	Adequacy of Educational System	Log Inflation	GDP Growth
Log GNI per capita 2005	0.943	0.831	-0.235	0.038	0.033	0.195	0.973	-1.035	17.6290	0.5470	-0.929	-0.503
	(5.93)***	(4.24)***	(2.02)*	(2.28)**	(1.73)*	(2.35)**	(7.41)***	(16.37)***	(7.58)***	(3.15)***	(3.42)***	(0.86)
Trust in people	3.257	1.764	0.195	0.194	0.15	1.257	2.589	-0.446	14.541	3.383	-2.819	2.721
	(4.39)***	(2.65)**	(0.23)	(2.98)***	(3.19)***	(2.66)**	(4.40)***	(1.06)	(0.92)	(5.52)***	(2.57)**	(1.13)
Constant	-6.797	-5.661	5.605	-0.352	-0.312	-1.884	-5.495	12.196	-125.804	-2.05	11.724	6.486
	(4.59)***	(3.11)***	(4.89)***	(2.21)**	(1.73)*	(2.33)**	(4.59)***	(18.75)***	(5.68)***	(1.26)	(4.57)***	(1.22)
Observations	38	38	37	37	37	37	35	38	38	37	38	38
R-squared	0.61	0.62	0.04	0.45	0.35	0.39	0.69	0.80	0.51	0.58	0.47	0.09
Robust t-statistics in parentheses												
* significant at 10%; ** significant at 5%; *** significant at 1%												

Table 3.6: OLS regressions, High Human Developed and Medium Human Developed countries.

High Human Development

Dependent Variable	Government Efficiency			Participation		Large Organizations	Social efficiency					
Independent Vars.	Corruption	Bureaucracy Quality	Tax Compliance	Civic Participation	Participation in Profesional Associations	Sales biggest firm/GDP	Adequacy of Infrastructure	Log Infant Mortality	Completed High School	Adequacy of Educational System	Log Inflation	GDP Growth
Log GNI per capita 2005	1.514	1.364	0.315	0.038	0.034	0.928	1.609	-0.865	5.403	0.8460	-1.697	-0.715
	(6.00)***	(5.93)***	(0.97)	(2.05)**	(1.63)	(2.00)*	(6.56)***	(6.81)***	(0.62)	(3.58)***	(4.10)***	(0.72)
Trust in people	1.915	-0.018	-0.538	0.188	0.13	-0.561	1.162	0.247	30.946	2.304	-1.311	-1.324
	(1.62)	(0.02)	(0.37)	(2.42)**	(2.30)**	(0.45)	(1.62)	(0.39)	(1.21)	(2.54)**	(0.95)	(1.00)
Constant	-12.229	-10.443	0.454	-0.343	-0.306	-8.497	-11.501	10.273	-10.802	-4.782	18.9	10.044
	(5.22)***	(4.75)***	(0.16)	(2.02)*	(1.60)	(2.05)**	(5.17)***	(8.98)***	(0.13)	(2.25)**	(4.82)***	(1.01)
Observations	40	40	41	41	41	43	39	42	39	41	41	42
R-squared	0.57	0.64	0.02	0.47	0.32	0.35	0.74	0.59	0.13	0.56	0.58	0.07

Medium and Low Human Develpoment

Dependent Variable	Government Efficiency			Participation		Large Organizations	Social efficiency					
Independent Vars.	Corruption	Bureaucracy Quality	Tax Compliance	Civic Participation	Participation in Profesional Associations	Sales Biggest Firms/GDP	Adequacy of Infrastructure	Log Infant Mortality	Completed High School	Adequacy of Educational System	Log Inflation	GDP Growth
Log GNI per capita 2005	-0.217	0.012	-0.055	-0.055	-0.049	0.07	0.528	-0.439	8.966	-0.0780	0.467	-0.732
	(1.10)	(0.08)	(0.28)	(2.75)**	(2.46)**	(1.46)	(3.32)***	(3.31)***	(3.06)***	(0.56)	(2.01)*	(1.43)
Trust in people	1.254	0.653	2.516	-0.117	-0.075	0.121	1.782	-0.362	-17.315	1.671	-1.024	8.215
	(1.50)	(0.97)	(2.94)***	(1.38)	(0.88)	(0.43)	(2.78)**	(0.57)	(1.73)	(1.77)*	(1.18)	(2.30)**
Constant	3.745	1.585	3.388	0.564	0.494	-0.485	-1.337	7.183	-49.12	3.514	-1.16	5.523
	(2.39)**	(1.20)	(2.36)**	(3.53)***	(2.80)**	(1.37)	(1.14)	(6.85)***	(2.02)*	(3.39)***	(0.66)	(1.28)
Observations	21	21	21	15	16	22	21	22	21	21	22	22
R-squared	0.14	0.04	0.3	0.44	0.42	0.13	0.48	0.32	0.32	0.13	0.17	0.28

Robust t-statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

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To get the causal effect of trust on social efficiency indicators, I instrument trust using the neuroactive hormone factors presented in section III: *eco-social, lignan* and *isoflavon* factors. As mentioned before, the first stage regression explains 60% of the total variation of trust for HHD countries and 50% for MHD countries. Table 3.7 reports the IV regression using the neuroactive hormone factors as instruments for trust. It is important to notice that the extraction of the factors to instrument trust is done separately for each sample of countries.

Table 3.7: IV regressions. Instrument: Neuroactive hormone factors

High Human Development. Instrument: neuroactive hormone factors

Dependent Variable	Government Efficiency			Participation		Large Organizations	Social efficiency					
Independent Vars.	Corruption	Bureaucracy Quality	Tax Compliance	Civic Participation	Participation in Profesional Associations	Sales Biggest Firms/GDP	Adequacy of Infrastructure	Log Infant Mortality	Enrollment Terciary Education	Adequacy of Educational System	Log Inflation	GDP Growth
Log GNI per capita 2005	1.014	0.978	0.11	0.007	-0.005	1.076	1.367	-0.895	1.744	0.3730	-1.605	-0.484
	(2.27)**	(3.67)***	(0.25)	(0.36)	(0.25)	(2.04)**	(4.03)***	(6.46)***	(0.18)	(1.03)	(4.03)***	(0.41)
Trust in people	4.913	1.819	1.019	0.349	0.359	-1.301	2.787	0.303	60.206	5.409	-0.815	-3.001
	(2.31)**	(1.79)*	(0.43)	(2.57)**	(1.94)*	(0.76)	(1.83)*	(0.33)	(1.87)*	(2.83)***	(0.70)	(1.13)
Constant	-8.149	-7.131	1.983	-0.09	0.016	-9.745	-9.602	10.56	16.211	-1.036	17.774	8.235
	(2.08)**	(2.92)***	(0.54)	(0.50)	(0.09)	(2.08)**	(3.30)***	(8.88)***	(0.18)	(0.34)	(4.75)***	(0.71)
Observations	38	38	40	38	38	40	38	40	37	40	39	40

Robust z-statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Medium and Low Human Development. Instrument: neuroactive hormone factors

Dependent Variable	Government Efficiency			Participation		Large Organizations	Social efficiency					
Independent Vars.	Corruption	Bureaucracy Quality	Tax Compliance	Civic Participation	Participation in Profesional Associations	Sales Biggest Firms/GDP	Adequacy of Infrastructure	Log Infant Mortality	Enrollment Terciary Education	Adequacy of Educational System	Log Inflation	GDP Growth
Log GNI per capita 2005	-0.201	-0.048	-0.069	-0.049	-0.046	0.059	0.509	-0.511	9.678	-0.1190	0.452	-0.860
	(1.04)	(0.28)	(0.38)	(2.66)***	(2.44)**	(1.16)	(3.39)***	(3.76)***	(2.97)***	(0.93)	(2.07)**	(1.27)
Trust in people	2.038	2.491	3.245	-0.344	-0.206	0.291	2.095	0.531	-37.57	1.536	-1.517	14.459
	(1.55)	(2.08)**	(1.90)*	(1.98)**	(1.58)	(0.73)	(1.65)*	(0.44)	(1.69)*	(1.54)	(0.98)	(2.70)***
Constant	3.369	1.601	3.351	0.554	0.493	-0.436	-1.228	7.588	-49.74	3.931	-0.875	4.865
	(2.19)**	(1.17)	(2.68)***	(3.86)***	(3.02)***	(1.20)	(1.25)	(8.03)***	(1.90)*	(4.10)***	(0.55)	(0.88)
Observations	20	20	20	14	15	21	20	21	20	20	21	21

Robust z-statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

The findings support the relevance of trust in causing efficiency in general but not for the specification for Large Organizations. The positive effect of trust on the measure for large organizations in La Porta was an important empirical support for the argument of Fukuyama (1995). In the present study we cannot reject that generalized trust has no effect on the size of firms.

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In the case of HHD countries, we observed the estimated coefficients for trust are statistically significant for most of the specifications. These better estimated coefficients doubled in magnitude the coefficients obtained in the OLS regressions, revealing the underestimation in previous results. Trust reduces corruption, improves bureaucracy quality, facilitates participation and impacts positively on the adequacy of infrastructure and educational system indicators, as well as on the rate of people enrolling in tertiary education.

For the sample of MHD countries, robustness is recovered for the specification related to Government Efficiency and Social Efficiency. The magnitude of the estimated coefficients for trust is again higher in comparison to their analogues OLS regressions. It is interesting to notice that trust seems to reduce participation and enrollment in tertiary education for this sample of countries. One possible explanation for the negative effect on participation could be related to the quality of these kinds of institutions in the countries. The indicators available for participation could be capturing something other than the simple fact of participating in "healthy" associations. If they are associated with corrupted groups of people or politically manipulated institutions, the effect of trust being negative would be correctly reflecting the negative impact of corruption, for example. In the case of tertiary education, the original measure in La Porta was Completed High School, attempting to account for social efficiency in the sense of the share of educated population. For the sample of HHD countries, our measure of enrollment in tertiary education is probably highly correlated with completed high school, because most of the people that finish high school in more developed countries continue studying. However, in less developed countries the direct link between finishing high school and going further is not clear any more. The self selection through working status could bias the results here. Also, if tertiary education requires fees, omitted variables referred to the population distribution of income could also be making the result spurious.

Overall, the causal effect of generalized trust on variables that capture the efficiency of societies as a whole has been estimated. The results confirm the relevant role of trust facilitating cooperation and then, reducing social inefficiencies.

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3.4. Conclusions

The main contribution of this chapter is the estimation of the causal effect of generalized trust on reducing social inefficiencies in societies. The magnitude of the effect is doubled with respect to previous results and the role of trust seems to be relevant both in developed and developing countries.

The instrument for trust that makes it possible to estimate the causal effect is based on neuroeconomic research. Oxytocin facilitates trusting behavior in humans and following Zak and Fakhar (2006) we have constructed a set of instruments that attempts to capture international levels of oxytocin. The instruments perform better than previous attempts using hierarchical religion in each country as an instrument for trust, following Putman (1993). For less developed countries, the Putman argument does not work, i.e. the imposition of hierarchical religions has no relation to the level of generalized trust for the sample of Medium Human Developed countries. In the present study the neuroactive hormones factors explain generalized trust satisfactorily in High Human Developed as well as in Medium Human Developed countries.

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Appendix 3.1: List of countries

Common set of countries between present study and La Porta et al (1998)	Additional countries available for the present study
Argentina	Albania
Austria	Algeria
Belarus	Bangladesh
Belgium	Bosnia and Herzegovina
Bulgaria	Croatia
Canada	Egypt
Chile	Greece
China	Indonesia
Czech republic	Iran
Denmark	Israel
Estonia	Jordan
Finland	Kyrgyzstan
France	Luxembourg
Germany	Macedonia
Hungary	Moldova
Iceland	Morocco
India	Pakistan
Ireland	Peru
Italy	Philippines
Japan	Saudi Arabia
Latvia	Singapore
Lithuania	Tanzania
Malta	Uganda
Mexico	Ukraine
Netherlands	Venezuela
Nigeria	Vietnam
Poland	
Portugal	
Romania	
Russian federation	
Slovakia	
Slovenia	
South Africa	
Spain	
Sweden	
Turkey	
United Kingdom	
United States	

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Appendix 3.2: Human Development Indicators

High Human Developed Countries (43)	Medium and Low Human Developed Countries (23)
Albania	Algeria
Argentina	Bangladesh
Austria	China
Belarus	Egypt, Arab Rep.
Belgium	India
Bosnia and Herzegovina	Indonesia
Bulgaria	Iran, Islamic Rep.
Canada	Jordan
Chile	Kyrgyz Republic
Croatia	Moldova
Czech Republic	Morocco
Denmark	Nigeria*
Estonia	Pakistan
Finland	Peru
France	Philippines
Germany	South Africa
Greece	Tanzania*
Hungary	Turkey
Iceland	Uganda
Ireland	Ukraine
Israel	Venezuela, RB
Italy	Vietnam
Japan	Zimbabwe
Korea, Rep.	
Latvia	
Lithuania	
Luxembourg	
Macedonia	
Malta	
Mexico	
Netherlands	
Poland	
Portugal	
Romania	
Russian Federation	
Saudi Arabia	
Serbia	
Slovak Republic	
Slovenia	
Spain	
Sweden	
United Kingdom	
United States	

(*) Low Human Developed countries.

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Appendix 3.3: Zak and Fakhar (2006) Replication

The main purpose of this section is to replicate the factor extraction done by Zak and Fakhar (2006). They get three orthogonal factors that, together with GNI per capita, account for 70% of the international variation of trust. Therefore, these factors would qualify as good instruments to get the causal effect of trust on social efficiency indicators. I used data contemporary to the one available for Zak et al to understand the procedure (see Table 3.3 in section 3.2). After correcting some limitations and introducing new neuroactive hormone related variables I obtain three factors that account for almost 60% of the variation of trust for the same sample or countries in Zak et al. The three factors are called *biosocial-eco*, *lignan* and *isoflavon* factors and the extraction procedure will be the one used to construct the instruments for trust in the present study (described in section III).

The sample of countries

Zak and Fakhar report to have a sample of countries of 41 countries with measures of generalized trust available. At the time, the third wave of the World Value Survey (WVS3) was available. In this study the WVS3 used is an updated version corrected by the official source in 2006, after reported mistakes in the original version. Only 26 countries of the Zak sample were present in the WVS3. The missing country information (10 countries) was taken from WVS2 and Greece and Luxembourg from WVS4. Information for New Zealand and Taiwan was not found. The final sample is then 39 countries.

Trust

As I said before, the value of generalized trust used by the authors most probably mixed information from WVS3 and WVS2. Here the value of trust is taken from WVS3 for 26 countries, from WVS2 for 10 countries and from WVS4 for 2 countries. The authors argue

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in favor of the dynamic stability of trust over time. It is important to mention that time specific shocks could have affected the contemporary levels of trust of some countries. For example, the formation of the European Union, economic crises, country specific shocks, etc. could have influenced the trust levels accordingly. Attempting to replicate the Zak results, I follow the same methodology bu, to prevent my results from confounding effects, the data for trust will be taken exclusively from WVS4 (1999-2004) for the whole sample of countries.

Neuroactive hormone-correlate variables

Recent neuroeconomics experiments with humans have demonstrated that trust between two individuals is facilitated by oxytocin (Zak et al, 2004, 2005b). Zak and Fakhar (2006) provides evidence showing the scaling up to a country level, i.e. that endocrine correlates are related to international levels of generalized trust. They collect data for three areas that are expected to be correlated with oxytocin and estrogen levels: biological processes that directly impact oxytocin; the frequency of social interactions, and the exposure to estrogen-like molecules in the environment (see Table 3 in section II).

The main limitations faced during the process referred to the availability of some of these variables for the whole sample of countries and, therefore, were not included in the present analysis. As discussed in section II, *Sex Frequency* and *Breast Feeding* do not have information for almost half of the sample of countries: 18 countries for sex frequency and 16 for breast feeding. *Ownership* was not included because of source accessibility.

The first attempt to construct the phytoestrogens data set by country was made following the references in Zak et al. They extract the phytoestrogen content in food identifying 13 components from Manzur (1998), Albertazzi et al (1999) and Pillow et al (1999). The information has many flaws that make it impossible to get information about phytoestrogen contents for many of the foods they summarize in the paper. As an example, they collect

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information about baby food, spices and meat consumption per capita, by country, but information about these items does not appear in the sources. I tried many approximations based on their sources without success.

The main problem of the sources used by the authors refers to the no-homogeneous scientific method to measure the content of phytoestrogens in food. In a recent work, Schwartz, Sontag and Plumb (2009) presents an inventory of phytoestrogens datasets, concluding that nowadays there is better and more accurate information than available for Zak. I select a more recently available study now that the same method for a wider variety of foods (Thompson, Boucher, Liu, Cotterchio and Kreiger, 2006). The phytoestrogens measured in this study are: Isoflavones (formononetin, daidzein, genistein, glycitein), Coumestans (courmestrol) and Lignans (matairesinol, lariciresinol, pinoresinol, secoisolariciresinol).

Finally, *Telephone usage* now also includes mobiles and a measure of *Internet users* was included as an extra social interaction variable.

Factor analysis

Table 3.9 shows the rotated loading factor matrix (Varimax rotation with Kaiser Normalization) after factor analysis for the 24 hormone-correlate variables discussed before (see table 3.3 in section 3.2). Factor assignments were made based on the largest loadings. The first constructed factor, call *biosocial-eco factor*, includes loadings factors for variables related to social interaction (internet and telephone penetration, share of rural population, share of Muslims, Hindus and Protestants in the population) as well as consistent-with-intuition loadings for biological processes (share of females in population, fertility rate) and environmental exposure (water pollution, CO2 emissions). It accounts for 21% of the overall inter-country variance among the 24 hormone-correlate variables included in the analysis.

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The second and third factors are mainly related to the dietary intake of phytoestrogens. The majority phytoestrogens belong to a large group known as flavoids (isoflavones, coumestans and prenyl flavonoids). They possess the most potent oestrogenic activity. A class of non-flavonoids, the lignans, has also been identified. Even though they are not thought to be oestrogenics themselves, they are converted to oestrogenic compounds by the gut microflora (Bakker, 2004). As can be see here, the second factor collects mainly lignans loading and the third, isoflavones. Therefore, I will call them *lignan-factor* and *isoflavon-factor*, respectively. The *lignan-factor* accounts for 31% of the overall inter-country variance among the 24 hormone-correlate variables included in the analysis. The *isoflavon-factor,* for 14%.

Table 3.9: Rotated factor matrix.

	Extracted Factors		
	Biosocial-eco	*Lignan*	*Isoflavon*
CO2 emissions	0.65		
Fertility rate	-0.64		
Internet usage	0.75		
Female population	0.54		
Fixed and mobile phones	0.89		
Latitud	0.48		
Rural population	-0.62		
Muslims	-0.53		
Indus	-0.40		
Protestants	0.68		
Water pollution		-0.44	
Protected land areas		-0.26	
Formononetin		0.97	
Matairesinol		0.97	
Lariciresinol		0.97	
Pinoresinol		0.97	
Secoisolariciresinol		0.85	
Courmestrol		0.37	
Density			0.44
Daidzein			0.95
Genistein			0.95
Glycetin			0.94
Buddhists			0.91
Catholics			-0.46
Jews			-0.17

Extraction Method: Factor Analysis. Rotation: Varimax with Kaiser Normalization.

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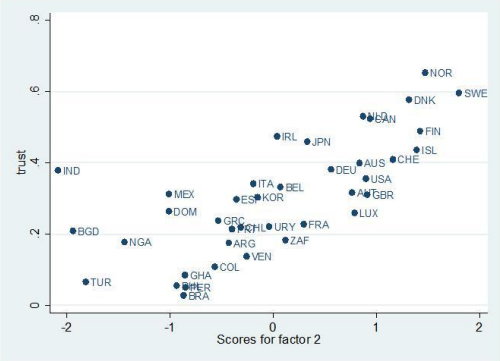
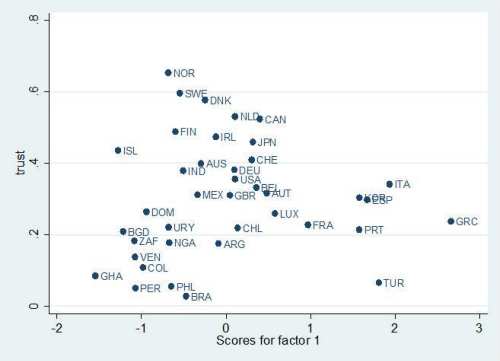
Figure 3.3 shows the scatter plots of trust and the three factors. The expected positive relationship with trust is not very clear for the *lignan-factor* as it is for the *biosocial-eco* and *isoflavon-factors.*

Figure 3.3: Trust and neuroactive hormone factors

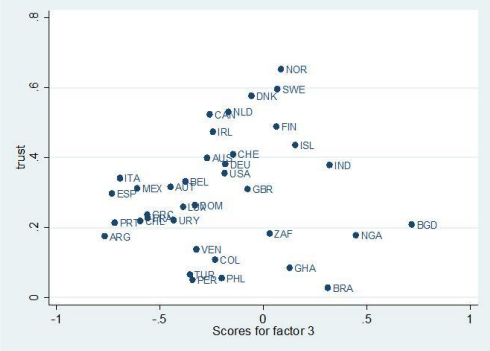
3.3a. Biosocial-eco factor



3.3b. Lignan-factor



3.3c. Isoflavon-factor



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The first stage OLS regression of trust on these three factors, with the logarithm of GNI per capita as a covariate control, explains 57% of the variation in trust for the sample of 39 countries, compared to 70% explanatory power in Zak et al. The *biosocial-eco* factor is positively and statistically significantly related to trust (p=0.02, t-test). The *lignan-factor* has a non-different from zero effect on trust (p=0.3, t-test) and the *isoflavon-fact*or is positively and statistically significantly related to trust (p=0.06, t-test). Therefore, it seems that the dietary intake of isoflavones is more relevant than non-flavonoids when affecting the quality of social interactions that people have.

Therefore, the extraction procedure described before will be the one used to construct the instruments for trust in the present study (described in section 3.3).

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