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DOES CULTURE AFFECT ECONOMIC OUTCOMES?

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### **ABSTRACT**

Economists have been reluctant to rely on culture as a possible determinant of economic phenomena. The notion of culture is so broad and the channels through which it can enter the economic discourse so vague that it is difficult to design testable hypotheses. In this paper we show this does need to be the case. We introduce a narrower definition of culture that allows for a simple methodology to develop and test cultural-based explanations. We also present several applications of this methodology: from the choice to become entrepreneur to that of how much to save, to end with the political decision on income redistribution.

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Until recently, economists have been reluctant to rely on culture as a possible determinant of economic phenomena. Much of this reluctance stems from the very notion of culture: it is so broad and the channels through which it can enter the economic discourse so ubiquitous (and vague) that it is difficult to design testable (i.e., refutable) hypotheses. Without testable hypotheses, however, there is no role for culture in economics except perhaps as a selection mechanism among multiple equilibria (Greif, 1994, 2005). In recent years, however, better techniques and more data have made it possible to identify systematic differences in people's preferences and beliefs and to relate them to various measures of cultural legacy. These developments suggest an approach to introduce cultural-based explanations that can be tested and are able to substantially enrich our understanding of economic phenomena. This paper summarizes this approach and its achievement so far, outlining at the end directions for future research.

The necessary step to achieve these goals is to define culture in a sufficiently narrow way that makes it easier to identify a causal link from culture to economic outcomes. For this reason, we define culture as *those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation*. While not comprehensive, this definition focuses on those dimensions of culture that can impact economic outcomes. In addition, by restricting the potential channels of influence to two standard ones -beliefs (i.e, priors) and values (i.e, preferences)-, this definition provides an approach to identify a causal effect from culture to economic outcomes.

The first step in this approach is to show a direct impact of culture on expectations and preferences. Most studies surveyed in this paper use survey data, although experimental evidence has also been used to establish this connection (like Henrich et al., 2001; Bornhorst et al., 2005).

The second step is to show that those beliefs and preferences have an impact on economic outcomes. In one of the examples we provide in this paper, for instance, we first show that different religious affiliations and ethnic background are associated with

different preferences for redistribution. We then document that different preferences for redistribution affect actual redistribution in state-level fiscal policy in the U.S.

To claim a causal link, however, a third step is necessary. All work on culture and economics faces the problem that causality is likely to go both ways -- from culture to economics and from economics to culture. The above definition of culture suggests an answer: to focus only on those dimensions of culture that are inherited by an individual from previous generations, rather than voluntarily accumulated. As Becker (1996, p. 16) writes: "Individuals have less control over their culture than over other social capital. They cannot alter their ethnicity, race or family history, and only with difficulty can they change their country or religion. Because of the difficulty of changing culture and its low depreciation rate, culture is largely a 'given' to individuals throughout their lifetimes." Moreover, religious practices, even when they respond to economic conditions, are modified over time only at centuries or even millennium frequency (see, for example, Botticini and Eckstein, 2005). In this spirit, we restrict our attention in this paper to those cultural aspects like religion and ethnic background that can largely be treated as invariant over an individual's lifetime.

This choice allows us to isolate the cultural component of beliefs and preferences by instrumenting them with their cultural determinants (for example, when we analyze the preferences for redistribution we use as instruments religion and ethnicity). This third and last step is legitimate if culture impacts the economic outcome only through the channel assumed in the regression. While this condition is unlikely to be met in many applications, it is in some (e.g., Tabellini, 2005).<sup>1</sup>

The advantage of this three-step procedure is that it prevents cultural explanations from becoming simple ex post rationalizations. By tracing the effect of culture through the economic channels it is supposed to affect, this approach reduces the risk of spurious correlations. Its ultimate validity, however, resides in its ability to enhance our understanding of economic behavior.

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<sup>1</sup> This is not the only possible method. Bisin, Topa, and Verdier (2004), for instance, use a structural estimation approach.

Restricting the attention to the inherited, slow-moving components of culture differentiates this approach from the social interaction literature surveyed by Manski (2000), which focuses on the peer group effects that can be viewed as the fast-moving component of culture. In treating culture as inherited by individuals, we are not denying the possibility that long-standing cultural traditions are the result of a society-wide optimization process (see, for example, the economic analysis of dowries in Botticini and Siow, 2003), but simply that culture is not continually altered in step with the changes that individuals experience during their lifetimes. Emigrants from southern, low-trust, regions in Italy, for instance, tend to carry with them their mistrust to their new locations (Guiso, Sapienza, and Zingales, 2004a). Similarly, people who are raised religiously exhibit some common beliefs and preferences, even if they reject religion as adults (Guiso, Sapienza and Zingales, 2003).

Why do some cultural influences change so slowly (Roland, 2005)? While a full answer is outside the scope of this work, we conjecture three explanations. First, parents have a natural tendency to teach their children what they have learned from their own parents, without a full reassessment of the current optimality of those beliefs (Bisin and Verdier, 2000). An example of this persistence is the Mursi people's tradition that women wear large lip ornaments made of clay that disfigure their lips and force them to remove some of their frontal teeth. While today's Mursi have lost the reason for this tradition (some claim it was introduced to make women less interesting to slave traders; see Gordon, 2003), it is still maintained to this day. Thus, even if cultural norms were efficient when they were introduced, they might continue to be taught even after they have become inefficient (Grusec and Kuczynski, 1997).

Second, organizations that play a role promoting culture – including state, church, and academia -- might have a vested interest in promoting the continuation of any beliefs that provide them with rents. Female infibulations, for instance, is still widespread in many parts of the world in spite not only of the physical pain imposed on women, but also of the reduced fertility it engenders (Almroth et al. , 2005) for the power it gives to men.

Finally, some cultural norms may produce lesser outcomes in terms of economic output, but greater outcomes in terms of higher fertility, and such norms can become more widespread in the population despite their economic inefficiency.

Whatever the explanation for the delayed adjustment process of culture, it enables us to use deeper aspects of culture like the ethnic origin or the religious denomination as exogenous variables and thus reduce the risks of the reverse causality problem in regressions that explore the impact of culture on economic outcomes.

The next section of this paper provides an abbreviated overview of the historical debates on the relationship between economics and culture. The following two sections review the evidence and arguments on how deep aspects of culture like ethnic background or religion, acting through beliefs or preferences, can affect economic outcomes. Sometimes the effect of culture goes through both these channels at the same time, as it is the case for social capital. We discuss this in the last section.

## **Historical Perspectives on Economics and Culture**

### *The origin of the debate*

Classical economists were comfortable in using cultural explanations for economic phenomena. Adam Smith viewed his *A Theory of Moral Sentiments* as an integral part to the “Wealth of Nations”. And John Stuart Mill regarded cultural constraints as sometimes more important than even the pursuits of personal interest (see “System of Logic,” 1843, p. 484).

Karl Marx inverted this direction of causality: rather than culture determining economic relations, he argued that the underlying technology determines the type of social structure prevailing and even the dominant culture: the hand-mill produces feudal society and the steam-mill capitalism. In a famous passage in his preface to “A Contribution to the Critique of Political Economy,” Marx (1859) writes:

In the social production of their life, men enter into definite relations that are indispensable and independent of their will, relations of production which correspond to a definite stage of development of their material productive forces. The sum total of these relations of production constitutes the economic structure

of society, the real foundation, on which rise legal and political superstructures and to which correspond definite forms of social consciousness. The mode of production of material life conditions the social, political and intellectual life process in general.<sup>2</sup>

Whereas Marx saw religion as a byproduct of production relations, Max Weber (1905) regarded religion as crucial to the development of capitalism. Any new economic order – argued Weber – faces initial resistance. Economic incentives are not sufficient to motivate entrepreneurs to break apart from the pre-existing order. However, Weber argued that the Protestant Reformation taught that the pursuit of wealth should be regarded not merely as an advantage, but as a duty. This religious anointment gave the bourgeoisie the moral strength to subvert the previous order and create a new one, based on the organization of free wage-earners for the purpose of economic profit.

An original synthesis between Marx’s view of historical evolution and Weber’s is provided by Antonio Gramsci. While Marxist, Gramsci recognizes the role played by culture in history. Power is not merely domain but hegemony, i.e. the ability to influence society morally and intellectually. In the class struggle, thus, workers can gain consensus in other social groups by imparting their world view and system of values to other classes. Cultural hegemony, i.e. the control of the intellectual life of society by purely cultural means, is crucial to political dominance. Hence, Gramsci (1949) thinks that not only economic interests but also the dominant culture can explain political outcomes, a link we are going to study empirically in Section 3.

Karl Polanyi agreed with Max Weber (1905) that religion was important to the establishment of markets, but also viewed religion and culture as a factor in moderating the excesses of the market. In a famous passage, Polanyi, Arensberg, and Pearson (1957, p. 250) write: “The human economy ... is embedded and enmeshed in institutions, economic and non-economic. The inclusion of the noneconomic is vital. For religion or

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<sup>2</sup> Some recent interpreters of Marx caution against an excessively mechanistic interpretation of his view of the historical process, and point out that even orthodox Marxism reserves a role for culture in human history and on economic choices (for example, Kolakowski, 1978). Nonetheless, after Marx the problem of two-way causality between culture and economics was clearly on the table and generated a very active debate, often with an emphasis on the interaction between culture and institutions.

government may be as important to the structure and functioning of the economy as monetary institutions or the availability of tools and machines themselves that lighten the toil of labor.”

### *Economic Imperialism*

In the decades immediately after World War II, the work of Gramsci and Polanyi was enormously influential in political science and sociology (see the excellent survey by DiMaggio, 1994), but fell on deaf ears among economists.

As economic theory increased its mathematical sophistication and the set of tools at its disposal expanded, no need was felt to introduce other potential explanatory variables that, on top, were hard to measure. Not only did economics lose any interest in its relation with culture, but, as it became more self-confident in its own capabilities, it moved to explain culture as a mere outcome of economic forces.

This movement, which is mostly associated with the Chicago school, is very Marxian in spirit. But there is no trace of class struggle. To the contrary, the Chicago school pursues a “rational” Marxian agenda, where people beliefs, tastes, and values are individual or societal’s rational choices and any element of conflict can be resolved through the price system.

It is during this period that Muth (1961) and Lucas (1976) endogenize beliefs, arguing that individuals’ priors should coincide with the objective distribution of the model. At the same time, Stigler and Becker (1977) endogenize consumers’ preferences, starting from a common utility and assuming different degree of investment. Finally, Iannaccone (1988) and Coleman (1990) begin to interpret religious and social norms as the result of a group-level optimization. This approach spawned a large literature that endogenizes many cultural aspects. For example, Glaeser, Laibson, and Sacerdote (2002) extend human capital investment theory to investment in social skills and social interactions by individuals. In this approach, the returns from investing in local networks are higher the lower the probability of moving and the greater the number of remaining years of life span.



In this intellectually coherent body of work, it was very difficult to find any space for an independent role of culture. In fact, the only possible role is as a coordinating device, leading societies playing the exact same game to different focal points. This is the role of culture in Greif (1994, 2005), who explains the different societal organization of the Genoese and Maghribi traders as the culturally driven response to the same economic problem.

### *The non-economists*

During this period, while some non traditional economists such as Hirschman continued to link economic analysis to cultural factors (e.g, Hirschman, 1967), the most interesting work on the causal effect of culture on economic and political outcomes was undertaken by non-economists. For space considerations, we will focus here only on the contribution of a few researchers, who later became particularly influential among economists.

Banfield (1958) is the first to propose a cultural explanation for underdevelopment. In “The Moral Basis of a Backward Society” he attributes the underdevelopment of southern Italy to the excessive pursuit of narrow self interest by its inhabitants, a condition he labels “amoral familism.” Following Banfield, Putnam (1993) provides very interesting evidence of the positive effects of a more altruistic (“civic”) culture on the quality of political institutions. The national government in Italy introduced formally identical systems of regional government across the country. As Putnam shows, in areas that experienced free city states in the Middle Age, the level of what Putnam calls “social capital” is high and regional governments functioned much better. In areas that lacked that tradition, regional governments performed very poorly.<sup>3</sup> Fukuyama (1995) directly relates trust to economic development. He does not

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<sup>3</sup> The north and the south of Italy differ in many respects: geographically (the South is much more mountainous), logistically (communications are more difficult in the South), economically (traditionally the South has been characterized by latifunds cultivated with wheat or used to graze sheep, while the North by smaller plot cultivated with more value added crops). How can we be sure that this difference across these regions derives from a distant episode in history and not from all these other factors? Guiso, Sapienza and Zingales (in progress) try to disentangle these alternative hypotheses. To reduce other confounding effects, they exploit the differences in history across towns within the center-north of Italy to identify the effect of the free-city state experience from the rest. They find that several measures of a town’s social capital are positively related to the length of the city-state experience of that town. This finding confirms Putnam’s earlier argument, that historical experience carries consequences centuries later.

distinguish, however, between the trust that arises from better institutions (which is often a consequence of economic development) and the cultural component of trust.

The explosion of work on economic institutions in the late 1990s and early 2000s encouraged economists to go beyond formal institutions into informal institutions, which took them to an explicit consideration of culture. Institutionally-oriented economists like Landes (1998) emphasized both the links from culture to beliefs and values and from beliefs and values to economic outcomes, but with an argument presented in a detailed narrative form rather than with statistical evidence. Landes revisits the fundamental question of what drives the success of national economies and concludes in favor of attitudes driven by cultural factors. These cultural factors - thrift, hard work, tenacity, honesty, and tolerance- contrast with the xenophobia, religious intolerance, bureaucratic corruption, and state edicts that stifle enterprise. His judgment (p. 516) is that "if we learn anything from the history of economic development, it is that culture makes all the difference. (Here Max Weber was right on.)"

#### *Toward a new cultural economics?*

The opening through which culture entered the economic discourse was the concept of trust. Following the political scientists (Banfield, Putnam, Fukuyama), economists (Knack and Keefer, 1996, La Porta et al., 1997) started to study the economic payoff of trust. The appealing feature of trust is that it can be thought of as "the subjective probability with which an agent assesses that another agent or group of agents will perform a particular action" (Gambetta, 2000), and as such can be easily incorporated into standard economic models.

As a cultural variable, however, trust has severe limitations. Trust is not just an inherited cultural variable. People can develop trust because of the quality of the legal system or as the result of strategic interactions (Axelrod, 1984). Trust can even be the result of optimal investment in social capital (Glaeser, Laibson, Sacerdote, 2002). Moreover, culture can impact economic outcomes through mechanisms other than trust. Thus, subsequent work tried to establish a more direct link between culture and economic outcomes.

In what follows we present this work (as well as new evidence) distinguishing between the two main channels through which culture can affect economic outcomes: beliefs and preferences. In doing so, we maintain the standard economic assumption that each individual has one identity and maximizes the utility of this identity. We only assume that cultural upbringing can affect his priors or the parameters of his utility. A richer way to capture the effects of culture (but also one that will increase the endogeneity problem) is to consider the possibility of multiple identities (Akerlof and Kranton, 2000) and the role of culture in shaping these identities and making one versus another salient.

## **2. Culture, Prior Beliefs and Economic Outcomes**

People make many decisions in life in which they lack previous experience: which college to attend, which profession to undertake, how much to save for retirement. In these situations, choices must be based on prior beliefs. But how are these prior beliefs determined? Culture might play a big role here.

### *The Effect of Culture on Prior Beliefs*

Economics does not have much to say about priors. In fact, it is standard to assume that individuals have common priors, not because economists believe it, but because they must overcome the objection that it would be too easy (and thus vacuous) to explain economic phenomena on the basis of different priors chosen *ad hoc*.

Fortunately, in recent years the growing availability of direct information on people's beliefs allows the choice of priors to be based on empirical observation. It is possible to test, for instance, whether religious and ethnic backgrounds affect people's priors.

In Guiso, Sapienza and Zingales (2003), we looked at the effect of religion on trust around the world using the World Values Survey. Our dependent variable is a dummy equal to 1 if an individual replies "Most people can be trusted" to the question "Generally speaking, would you say that most people can be trusted or that you have to be very careful in dealing with people?". The coefficients of interest regard dummy

variables for each of the list of religions shown in Figure 1 (where the omitted category is “no religious affiliation”). The regression also includes demographic controls for health, gender, age, education, social class, and income as well as country fixed-effects, and dummy variables for different survey years and a dummy variable equal to 1 if the person does not believe in God (Guiso, Sapienza and Zingales, 2003, Table 4, offer more details).

Being raised religiously raises the level of trust by 2 percent. If a person regularly attends religious services, the level of trust increases by another 20 percent. This effect differs across denominations; while Catholic and Protestant have roughly a similar positive effect, Muslim, Hindu, and Buddhist do not.

In this paper, we replicate the same exercise within the United States, based on data from the General Social Survey. Unfortunately, religious classifications in the General Social Survey are not as detailed as in the World Values Survey (only three religious denominations are identifiable). The General Social Survey, however, measures ethnic origin of the respondent’s ancestors and allow us to study whether the culture transmitted by ancestors migrated from different countries plays a role in the beliefs of people living in the US. The effect of different religions on trust is similar to our previous study, albeit not statistically significant. By contrast, the U.S. data shows a strong effect of ethnic origin (see Figure 2); these effects are computed relative to Americans with British descendents. Taking the ancestors’ country-of-origin dummies as a group, they are jointly statistically significant; which implies that the level of trust an American has toward others depends in part upon where ancestors originated.

Ancestors’ origin dummies also have a clear pattern: the effect on trust is strong when ancestors come from countries that *today* have a higher average level trust. In Figure 3, we plot the estimated impact of having ancestors from different areas of the world – again, this is measured vis-a-vis having British ancestors -- against the difference between the level of trust that prevails today in those areas minus the average level of trust in Great Britain from the World Values Survey. There is a strong positive correlation (0.6) between the two. This finding is consistent with the idea that priors have

a cultural component, which is transported to the new world and continues to impact individual beliefs even in the new environment and even several generations later.

The biggest problem with these correlations is one of causality. In GSZ (2003) we try to address it in two ways. First, we show that these effects are present even for people that were raised religiously, independent of whether they continue to profess the faith afterwards. Since one does not choose his parents or his parents' religion, the reverse causality argument does not apply here. Second, we look at one episode in history where there was a discontinuous change in religious doctrine and study the impact of this on people beliefs. This change was brought about by the Second Vatican Council, which in 1962 substantially modified Catholic doctrine and teaching. Not only was the use of Latin in the Mass abolished, but also there was an opening up of dialogue with the other religious denominations. As a result, Catholics after 1960 received a very different education from their older peers. If these changes indeed affected the influence of Catholicism, we should see a difference in the effect of Catholicism on the older versus the younger generation. To control for generic cohort differences we insert a dummy for people born after 1960 into the basic regression and then interact this dummy with the different levels of religiosity of Catholics. Catholics brought up after Vatican II are indeed more trusting and tolerant. This result it is hard to explain just with the argument that religion practice responds to secularism, because the dummy for people borne after 1960 should already capture this effect.

Another potential difficulty with findings of this sort is that it may be difficult to separate culturally-based beliefs from rational expectations. Suppose that we observe (as it is indeed the case) that Swedes trust others more. Is this trust culturally driven or is it the rational prior driven by the different level of trustworthiness prevailing in the country the interviewed person is living in? In general, it is hard to tell. In some special cases, however, it is possible to distinguish among the two.

Guiso, Sapienza and Zingales (2004b) use Eurobarometer surveys where individuals from various European countries are asked how much they trust individuals from all the other European countries. In particular, the data allow us to identify three components of trust: the average level of trust Swedes have towards others, the average level of trust citizens of other countries have toward Swedes and an idiosyncratic

component of each match (Swedes and Germans, Swedes and Italian, etc.). Hence, these data allow us to compare how the Swedish view about Germans differs from other countries' view about Germans. We find that this idiosyncratic component of trust increases when two countries share the same religion and decreases when they have a long history of wars. It also decreases with the genetic distance between two populations (a measure not only of somatic similarity, but also of similarity in ancient cultural aspects).<sup>4</sup> This dependence of trust (and thus of a prior belief) on cultural variables weakens for more educated people, suggesting that education can reduce the role of these inherited cultural aspects in the formation of priors.

Another way to show that culture can affect beliefs is to conduct experiments. Henrich et al. (2001) compare the responses to ultimatum games across different tribes. In an ultimatum game a player proposes how to divide a sum of money with another player. If the second player rejects the proposed allocation, neither gets anything. If the second accepts, the first gets their demand and the second gets the rest. While the economists' optimal offer is arbitrarily close to zero, in almost all the experiments people offer more. Henrich et al. (2001) show that the average offer varies systematically across tribes (from a minimum of 26% for the Machiguenga tribe in Peru to a maximum of 58% for the Lamelara tribe in Indonesia) in a way that is correlated with the prevailing occupation of a tribe. Tribes whose basic subsistence activities required larger economies of scale and thus higher level of cooperation offered more. On the one hand, these findings vindicate Marx's claim that the structure of production determines the beliefs and more broadly the culture of a society. On the other hand, they suggest that once culture is formed, it persists and impacts economic relations beyond those which formed them.

An even more compelling experiment of the effect of cultural biases on beliefs is performed by Hoff and Priyanka (2005). They show that caste differences can affect individual performance by impacting individuals' expectations. When Indian kids were asked to solve mazes and caste was not publicly revealed, there were no caste differences

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<sup>4</sup> In a follow up work, Spolaore and Wacziarg (2005) show that genetic distance is also related with the difference in income across countries. Consistent with trust being important, they interpret this effect as cultural differences representing a barrier to the diffusion of innovation.

in performance. But making caste salient created a large and robust caste gap, due to the fact that low-caste subjects expect that others will judge them prejudicially and this mistrust undermines motivation.

When experiments are not feasible, one can still document a cultural bias in beliefs by showing that differences in beliefs across different culturally-distinguished groups do not correspond to objective differences in the underlying distribution of outcomes, but only to perceived differences. Alesina and Glaeser (2004) pioneer this method by showing that Americans have a very different perception of social mobility than the Europeans, but this different perception is not matched by the data.<sup>5</sup>

#### *The effects of priors on economic outcomes*

Having shown that culture as defined by religion and ethnicity affects beliefs about trust, we now want to show that these beliefs have an impact on economic outcomes. As Arrow (1972) wrote, “Virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period of time.” Several empirical papers show that the level of trust of a community affects economic performance (e.g. Knack and Keefer, 1996; Knack and Zak, 2001). These papers report direct regressions of trust on economic performance but do not dig deeper into the mechanism through which measured trust is positively correlated with growth or GDP per capita.

Trust can affect people’s economic decisions in several ways. Trust is particularly relevant when transactions involve some unknown counterpart like a buyer or seller of goods in another country, when the transaction takes place over a period of time rather than being completed on the spot, and when the legal protection is imperfect. International trade is then an area where trust should matter. Guiso, Sapienza and Zingales (2004a) use data on relative trust among European countries to study whether and how important trust is for international bilateral trade among these countries. Looking at trade in goods, financial assets, and direct foreign investment, they find that

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<sup>5</sup> An alternative interpretation of this fact is provided by Benabou and Tirole (2006). They build a model where there is complementarity between individual ideological choices. Strong beliefs in the fairness of the system pays less in a world in which there is strong fiscal redistribution. Hence, the emergence of two equilibria: an “American” one with low taxes and strong beliefs in fairness and a “European” one with high taxes and lower beliefs in fairness.

trust matters for all these transactions: a country that trusts another more tends to exchange more goods and financial assets with it, and to engage more in direct investment. These results hold after controlling for the typical variables the trade literature has focused on (distance, common borders, commonality of language) as well as for variables that have been ignored until recently in the trade literature, such as the differences in legal origin among country pairs. These cultural biases are so rooted that they affect even the equity portfolio allocation of professional equity funds investors.<sup>6</sup>

To show the power of this approach and the pervasive impact of culture in many economic choices, we carried out some regressions using beliefs about trust to predict economic outcomes. As a dependent variable we use the choice of whether to become an entrepreneur. When contracts are incomplete, many deals are made just by shaking hands, which means relying on trust. An entrepreneur who works in a much unstructured environment is more exposed to these types of deals. Hence, trustworthy individuals will have a comparative advantage in becoming entrepreneurs. Since whether an individual expresses trust is highly correlated with whether that individual is trustworthy (Glaeser et. al., 2000), we use our measure of trust as a measure of trustworthiness and study its impact on the probability of becoming an entrepreneur. We measure the choice of being an entrepreneur with a dummy equal to 1 if the respondent says that he or she is self-employed in the General Social Survey data and zero otherwise. “Trust” is a dummy variable equal to one if the respondent answered that most people can be trusted in response to the question: “Generally speaking, would you say that most people can be trusted or that you can't be too careful in life?” We also use control variables for gender, race, age and education.

As Table 1 reports, trust has a positive and statistically significant impact on the probability of becoming an entrepreneur in an ordinary least squares regression (the

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<sup>6</sup> In response to concerns about reverse causality, one can use instrumental variables like the history of wars between the country pairs, genetic distance, and religious similarity to forecast cultural differences, and then see how these predicted cultural differences affect economic outcomes. The instrumental variable approach often increases the predicted impact of culture on economic outcomes. Some examples are provided in the text below.



probit results are very similar). Trusting others increases the probability of being a self employed by 1.3 percentage points (14 percent of the sample mean).

One possible concern with this result is the direction of causality: if success breeds trust, then a successful entrepreneur might be more trusting, and not the other way around. To address this problem we use instrumental variables of religion and ethnic origin. In the two-stage least squares, instrumental variable approach, our first stage is to treat trust as a dependent variable and use dummy variables for Protestant, Catholic, Jewish and other religions, as well as a dummies for the ancestors' country of origin, as the independent variables. In the second stage, we then plug in the predicted values of trust for each individual as our regression with entrepreneurship as the dependent variable. This approach is intended to capture only the component of trust that is driven by the religious and ethnic background.

Table 1 shows that the coefficient of trust using this instrumental variables approach is significantly bigger than the coefficient using the ordinary least squares approach, suggesting that reverse causality is not a major problem. The remarkable difference in the size of the coefficients, however, suggests that either our proxy for trustworthiness is very noisy or that culture might affect the choice of becoming an entrepreneur also through other channels. For instance, perhaps cultural background affects attitudes towards risk, which in turn affect the choice to become entrepreneur. In either case, however, these results support the hypothesis that cultural background plays a role in important economic choices.

#### *Reduced Form Approach*

In many instances direct information about beliefs is not available; hence the researcher is forced to jump straight from cultural differences to economic outcomes. An example of work with this weakness is our own paper showing that the level of social capital affects the use of basic financial instruments, such as writing a check or purchasing of a share (Guiso, Sapienza and Zingales, 2004a). Similarly, Osili and Paulson (2004) find that U.S. immigrants from countries with poorer investment protections are more reluctant to buy shares, consistent with them extrapolating their country-of-origin prior to the new

environment.<sup>7</sup> Finally, Barro and McCleary (2002, 2003) show that some religious beliefs (such as beliefs in heaven or hell) have positive impact on economic growth.

In isolation, this work is less convincing, because it is unable to document the intermediate step. But it is useful in conjunction with other work, which gives credibility to the link. For example, by using Dutch micro data Guiso, Sapienza and Zingales (2005) show that individual level of trust does indeed affect stock market participation, validating the channel assumed in the two above papers.

### **3. Culture, Preferences or Values, and Economic Outcomes**

Through the socialization process, by which it is maintained and transmitted, culture affects individual's values. We distinguish between values that influence economic preferences (such as fertility or labor participation preferences) – which can be thought of as parameters of a person's utility function -- and political preferences (such as preferences for fiscal redistribution). Culture, thus, can affect economic outcomes through both these channels.

#### *The effect of culture on economic preferences*

The set of preferences economically relevant that can be affected by culture is potentially very large. Giuliano (2004) shows that living arrangements of US families are affected not only by economic conditions, but also by cultural heritage (for example the structure of the family in their country of origin). Similarly, Fernández Olivetti and Fogli (2004) and Fernández and Fogli (2005) show that cultural heritage affects work and fertility choices of American women. Finally, Ichino and Maggi (2000) document that in Italy preferences for shirking on the job are driven by a place of birth, which can be interpreted as a proxy for the cultural background.

All these papers, however, take a reduced form approach. In order to document the preference channel through which culture affects preferences, here we focus on saving decisions. We documented the link between religion and preference for thriftiness in Guiso, Sapienza and Zingales (2003). We infer this preference from the answers to a question from the World Value Survey: “Here is a list of qualities that children can be

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<sup>7</sup> Similarly, Morse and Shive (2004) find that the degree of patriotism of a country (subjective beliefs in how great your country is) influences its portfolio diversification choices.

encouraged to learn at home. Which, if any, do you consider to be especially important?” We coded the variable as 1 if the respondent lists as important “Thrift, saving money and things.” We regress this variable on several dummy variables for various religious affiliations, with the omitted category being “no religious affiliation.” The regressions also include controls variables for health, gender, age, education, social class, income, a dummy variable equal to 1 if a person does not believe in God, country fixed effects, dummy variables for the year in which the survey was done.

We found that Catholics are 3.8 percent more likely and Protestants 2.7 percent more likely than nonreligious people to view teaching thrift to their children as an important value, and these differences are significant respectively at the 1 and percent level. The effects of other religions are often larger in magnitude, but not statistically significant. For example, Buddhists are 7.2 percent more likely to place importance on teaching thrift than the nonreligious, Hindus are 7.2 percent more likely, and Jewish respondents are 6.4 percent more likely. The counterexample is that Muslims place essentially the same value on teaching thrift to children as the non-religious, although this effect is not statistically significant, either.

*From individual preferences to economic outcomes*

Do these cultural differences in individual preference over the value of teaching thriftiness have an actual impact on savings across countries? The World Value Survey has no data on individuals’ savings or consumption; hence we cannot test whether the preferences over teaching thriftiness affect individual savings decisions directly. Thus, we turn to national data on saving. In the first column of Table 2, we use the standard economic specification of saving implied by the life-cycle theory. The dependent variable is a country’s saving rate, measured as national saving divided by GDP. The explanatory variables are growth in per capita income, the dependency ratio (that is, the population above 65 and below 15 divided by the total population), and government savings.<sup>8</sup> These variables all have the sign predicted by the life cycle theory and are statistically significant: more growth leads to higher savings, more dependency less savings, and

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<sup>8</sup> We use the same data as Giavazzi et al. (2000) who also include a dummy variable for whether the country is an OECD member. When we include this variable, the coefficient on the dummy variable is not significant and our other results are unchanged, so we do not report these regressions here.

more Government savings leads to more total savings. Together these variables can explain 58 percent of the cross-country variability in the rate of savings.

In the second column we insert the percentage of people in each country who says that it is important to teach thriftiness to children. This proportion enters positively and significantly. A 10 percentage points increase in the share of people who think thriftiness is a value to be taught to children is linked to a 1.3 percentage point increase in the national saving rate. This variable increases the R-squared by 5.5 percentage points.

A remarkable insight emerges from these findings. The explanatory power of a cultural explanation for national saving is quite comparable in size to the power of the celebrated life cycle model. An increase of one standard deviation in the share of people who think educating children to thriftiness increases the saving rate by 1.8 percentage point increase in the national saving rate (9 percent of the sample mean). Increasing the growth rate of income by one standard deviation raises national savings by 1.8 percentage points, while lowering the dependency ratio by one standard deviation increases national saving by 3.18 percentage points. This result suggests that to understand cross-country differences in national savings rates cultural variables are as important as economic ones.

Again, concerns arise over the possibility of reverse causality. For example, perhaps people who save a lot also teach this to their children as a rationalization of their own behavior. Thus, in the first step of the instrumental variables process, we use the importance of encouraging children to learn thrift as a dependent variable, and use the proportion of people of the different religious denomination in each country as the instrumental explanatory variables. This process is meant to capture how much of the importance of teaching thrift to children can be explained by religious background. We then take the predicted values of thrift based on the coefficients of the instrumental variable regression, and insert them back into a regression like the one in the second column of Table 2. The results are shown in the third column.

With this instrumental variable approach, the impact of the importance of teaching thriftiness to children on savings doubles in size, although the statistical

significance weakens from the 5 percent to the 10 percent level.<sup>9</sup> The large increase in the estimated coefficient casts some doubt on the validity of the instrument, especially in light of the low explanatory power of the first stage regression. While using individual data and controlling for country fixed effects shows that different religion denominations have a strong impact on the teaching of thriftiness, this impact weakens significantly in the cross-country regressions. Hence, the IV estimate should be viewed as tentative.

A similar approach but at the micro level is followed by Knowles and Postlewaite (2004). By using the PSID, not only do they document that parents' and children saving behavior is correlated, but they also show that this behavior is correlated to their stated preference on planning horizons.

#### *The effect of culture on political preferences*

Culture can also affect behavior and outcomes through its effect on political preferences of individuals about what governments should do: for example, how much government should intrude in economic life, promote competition, regulate the market, redistribute income, run a social security program, or nationalize certain industries and businesses.

Figure 4 shows the impact of religious affiliation on the preferences for redistribution of American citizens. To identify these preferences we use the following question contained in the General Social Survey: "Some people think the government in Washington ought to reduce the income differences between the rich and the poor, perhaps by raising the taxes of wealthy families or by giving income assistance to the poor. Others think that the government should not concern itself with reducing this income differences between the rich and the poor. Here is a card with a scale from 1 to 7. Think of a score of 1 as meaning that the government ought to reduce the income differences between rich and poor, and a score of 7 meaning that the government should not concern itself with reducing income differences. What score comes closest to what

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<sup>9</sup> We also carried out estimates using inflation-adjusted national saving rates. The magnitude and statistical significance of the results remain unchanged.

you feel?” We recoded the answers so that a higher value means that the respondent agrees that the government should involve itself more in redistribution.

We used this opinion data as the dependent variable in a regression. The key independent variables were dummy variables for different religions – Catholic, Jewish, Protestant, and Others – leaving “no religion and atheists” as the omitted group. As usual throughout this paper, we included control variables for health, gender, education, and race. Catholics, Protestant and Jewish respondents all have a more negative attitude toward redistribution than those with no religion, although the coefficient on Jewish respondents is not statistically significant. Followers of other religions are more in favor of redistribution, albeit the effect is not statistically different from zero.

Figure 5 repeats the same exercise, except instead of using the dummy variables for religion, in this case we use dummy variables differentiating by the country of origin of the ancestors. The omitted group is Americans of British origin. Americans with known African ancestors and generically all African Americans are 20 percent more in favor of redistribution than the typical American of British origin. Remember, these results hold true even after controlling for whether the respondent is white, as well as for the other demographic variables like income, education, gender, age, and health status. The second group more in favor of redistribution is the American with Canadian origin, with the Hispanic and the American Indian following close behind. The least in favor of redistribution are the Japanese Americans, who are less in favor of redistribution than the British Americans, although this results is not statistically significant.

One interpretation of these results is that Americans with British, North European or German ancestors are earlier immigrants. Hence, more generations were raised in the United States and forged by its culture, absorbing the belief that the success is mostly determined by individual actions, which makes government intervention highly undesirable. By contrast, those from other areas are comparatively more open to redistribution. But whatever the exact interpretation for each region, the country-of-origin dummies capture many dimensions of the received culture.

*From political preferences to economic outcomes*

Will these preferences about redistribution affect the government's level of redistributive policies? Some work has investigated this question. Alesina and Glaeser (2004) document a strong positive correlation between the proportion of people who believe poverty is society's fault (or that luck determines income) and that country's share of GDP spent in social welfare. However, they attribute these differences in beliefs to political indoctrination, and do not investigate possible cultural determinants. Alesina and La Ferrara (2001) rely, as we do, on the General Social Survey and show that those who express a preference for equal opportunities are more averse to redistributive policies. They are not concerned, however, with the link between these preferences and outcomes.<sup>10</sup>

To show how cultural determinants of beliefs also affect the actual involvement of a government in redistributive policies, we use the variation in the degrees of redistribution across U.S. states. Since indirect taxes like sales taxes tend to be regressive, while income taxes progressive, we measure engagement in redistribution by taking the ratio of the share of state government revenues coming from income taxes and the one coming from sale taxes and other indirect taxes (using data collected by the U.S. Census Bureau). States that redistribute more should exhibit a higher ratio.

For our key independent variable, we use the average state responses to two questions in the General Social Survey. The first two regressions in Table 3 use the answers to the question that was described in the previous section: it's the question about how "some think the government in Washington ought to reduce the income differences between the rich and the poor ...". Since we have annual data but the extent of redistribution does not vary very much over time we average the data.

The last two regressions in Table 3 use the answers to a similar question asked only in 1987: "It is the responsibility of the government to reduce the differences in income between people with high incomes and those with low incomes." The variable is coded 1–5, where a higher number represents stronger preferences for redistribution. We

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<sup>10</sup> Alesina and Angeletos (2005) show theoretically that differences in beliefs about social justice lead to differences in equilibrium redistribution. They also show that different beliefs in what determines individual incomes (luck or effort) across countries affects the size of social spending in a country, but do not enquire whether differences in beliefs are driven by culture.

also control for the state GDP per capita, the size of the population living in the state, and the percentage of population that is below the poverty rate.

The first and third columns of Table 3 provide our ordinary least squares estimates. In these regressions, the sign of the coefficient on the preferences variable is positive, but the effect is not statistically significant in the first column and is only marginally significant in the second column.

We then use an instrumental variable approach. To obtain our instruments we compute the fraction in each state that belong to the various religion denominations and the fractions whose ancestors come from the 16 sets of countries and areas listed in the previous table. We then run regressions with the dependent variable as one of our two measures of the preference for redistribution, to calculate what part of those values can be attributed to cultural factors. We then take the estimate coefficients from those regressions to predict the preferences variable, and insert those predicted values into the regression framework. Using this instrumental variable approach, the estimated coefficient of the preference for redistribution on actual redistribution becomes much bigger and is marginally statistically significant. Increasing the intensity of preferences for redistribution by one standard deviation raises the ratio of direct/indirect taxation by 14 percent of the sample mean in the second column or 20 percent of the sample mean in the fourth column. The underlying cultural determinants of preferences for redistribution do seem to have an impact on the amount of redistribution that occurs, although the statistical significance is somewhat weak.

#### **4. Culture and Institutions**

If culture affects beliefs and values, it can also have an effect on broader political outcomes. In his study of different Italian regions, Putnam (1993) documents a large number of positive institutional outcomes associated with higher social capital, like more efficient health care systems. Social capital, at least as intended by Putnam, can be seen as a combination of values (people feel a moral duty to go and vote) and beliefs (I expect to be ostracized by my community if I behave in an un-civic way).

Another suggestive example is provided by Licht et al. (2004). They focus on three cultural trade-offs: between embeddedness and autonomy, between hierarchy and



egalitarianism, and between mastery and harmony with nature. By using survey responses of elementary and high school teachers in 53 countries (Schwartz, 1999, 2004), they document that countries more tilted in favor of autonomy, egalitarianism, and mastery exhibit higher rule of law, less corruption, and more democratic accountability. To control for the possibility of reverse causality, Licht et al. (2004) adopt an intriguing strategy -- they use the grammar of pronouns as an instrumental variable. They argue that languages which require the explicit use of 'I' or 'you' signals that a person is highlighted and autonomy is valued. Conversely, languages that allow dropping the pronoun emphasize the contextualization of the person and thus reflect a more embedded culture. Thus, they argue that this grammatical difference can serve as an instrument for a society's degree of embeddedness or autonomy. While this is only a partial fix (one instrument for their three endogenous variables), it is potentially a very interesting strategy to capture long-term characteristics of a country's culture.<sup>11</sup>

Both these papers, however, do not show that the effects of culture on institutions have an economic payoff. Evidence in this direction is provided by Tabellini (2005). He measures culture as the "principal component" of four values: trust, beliefs in the importance of individual effort, generalized morality, and obedience (which he considers a negative value), which are inferred from questions on the World Values Survey. In this methodology, the principal component can be understood as a variable underlying these four values, in such a way that the variance of the culture with these factors is minimized. He then uses a measure of education and of historical political institutions across 69 European regions as his measure of culture. He finds that the quality of the historical institutions (such as constraints on the executives) has a positive and statistically significant effect on today's social values. He documents that both GDP per capita and growth are higher in those regions that exhibit higher levels of the "good" cultural values like trust, beliefs in individual effort, generalized morality, and low obedience. More importantly, the effect is bigger when he uses an instrumental variable approach and first predicts the four values with their historical determinants, before carrying out the

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<sup>11</sup> La Porta et al. (1999) and Stulz and Williamson (2003), instead, use a reduced-form approach and relate the religious composition of a country to the quality of its government and the forms of creditors' law. Similarly, Muller and Philippon (2005) show that the religion composition affects the quality of labor relations, which in turn affect corporate ownership concentration.

principal component methodology and creating a culture variable. This evidence strongly suggests that “better” cultural values do have a large economic payoff.

## **Conclusion**

Sociologists and anthropologists (e.g., Richerson and Boyd, 2005) have accumulated a wealth of field evidence on the impact of culture on economic behavior. As one of many examples, Salamon (1992), documents that in southern Illinois, in spite of the similarity of environmental conditions, towns inhabited by descendents of German-Catholic who settled in the 1840s and towns inhabited by descendents of Yankee settlers from other parts of the United States (mainly Kentucky, Ohio and Indiana) showed substantial differences in the structure of land ownership, farming practices, choice of crops, and female fertility. German-Catholics almost never sold their land and had on average more children, and thus tend to grow crops that are more labor-intensive to employ their children. Yankees saw farming as a business, bought and sold land more often, grew less labor-intensive crops such as corn, and had fewer children. Interestingly, while Yankees were generally more profitable, the German-Catholic model did not become less prevalent after more than a century, because of the higher fertility of German Catholics. Not only did culture have an effect, but this effect persisted over time in spite of its lower profitability.

In recent years, economists have begun to apply their analytical frameworks and empirical tools to the issue of culture and economic outcomes. Better techniques and expanded data have made it possible to identify systematic differences in people’s preferences. As this paper documents, cultural hypotheses can be rigorously tested and are economically important for fundamental economic issues like national rates of saving.

As this research on culture and economic outcomes expands, it raises an exciting set of questions. How does culture emerge and how does it persist? What roles are played by production technology, political power, efficiency concerns, and even factors like hygienic considerations? What determines the persistence of the cultural traits? What is the interaction between culture and formal institutions? Importing cultural elements will make economic discourse richer, better able to capture the nuances of the real world, and ultimately more useful.

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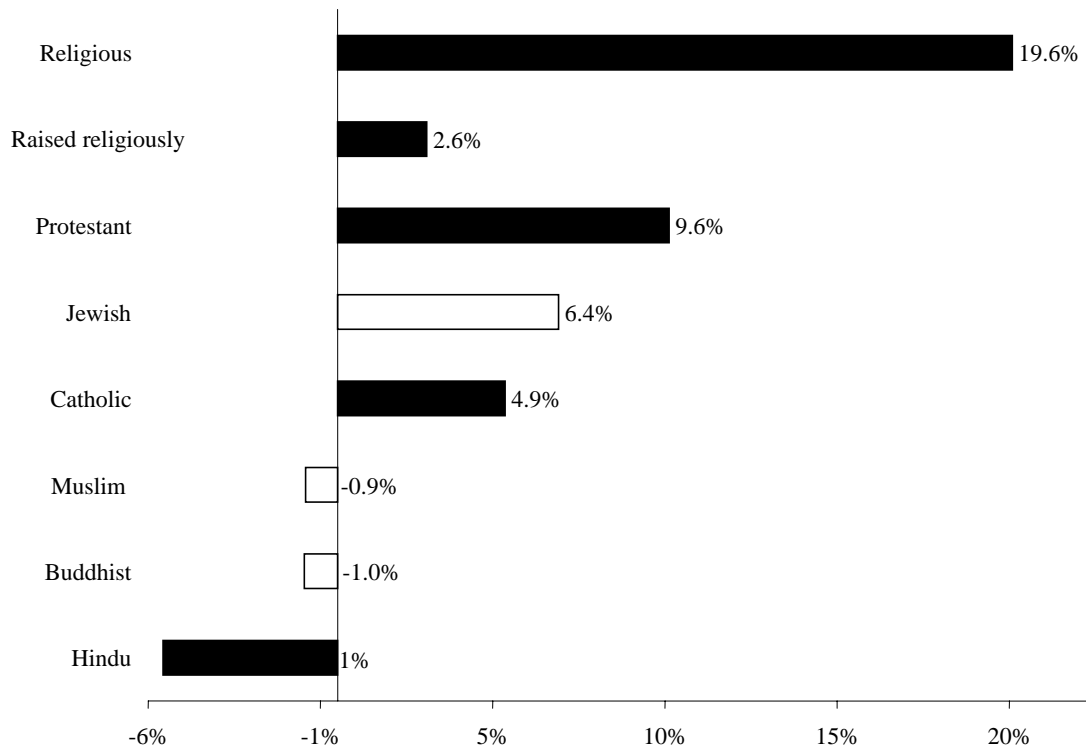
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Figure 1

**Effect of Religion on Trust**



The patterns denote:

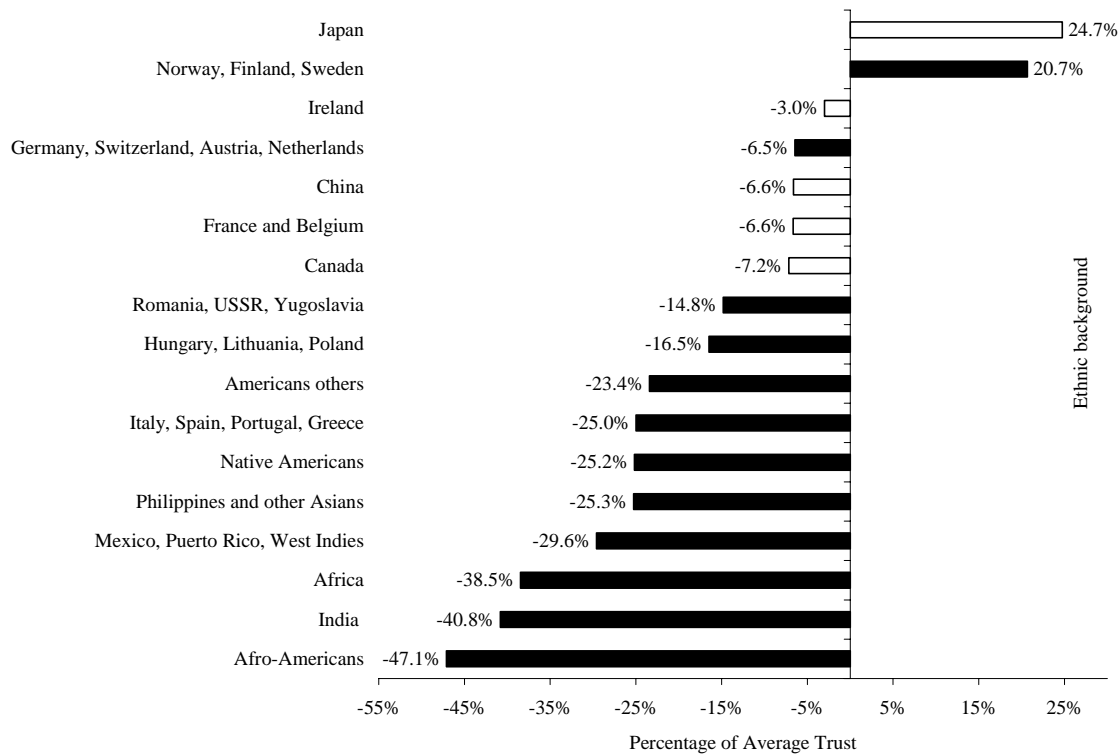
Significant      ■ Not significant      □

Source: European Values Survey and World Values Survey 1981-1984, 1990-1993, 1995-1997 (ICPSR 2790); Guiso, Sapienza and Zingales (2003), tables 2 and 4.

Note: The bars represent the effect of religious affiliation on trust in percent of the sample mean of trust and relatively to “no religious affiliation”. Effects are obtained from a regression where the dependent variable is “trust in others”, which equals to 1 if participants report that most people can be trusted. Besides religious affiliation dummies, the regression also includes demographic controls (health, male, age, education, social class, income; coefficients not reported), a dummy variable equal to 1 if a person does not believe in God, country fixed effects, and survey-year dummies.

Figure 2

**Effect of Ethnic Background on Trust**



The patterns denote:

Significant      ■ Not significant      □

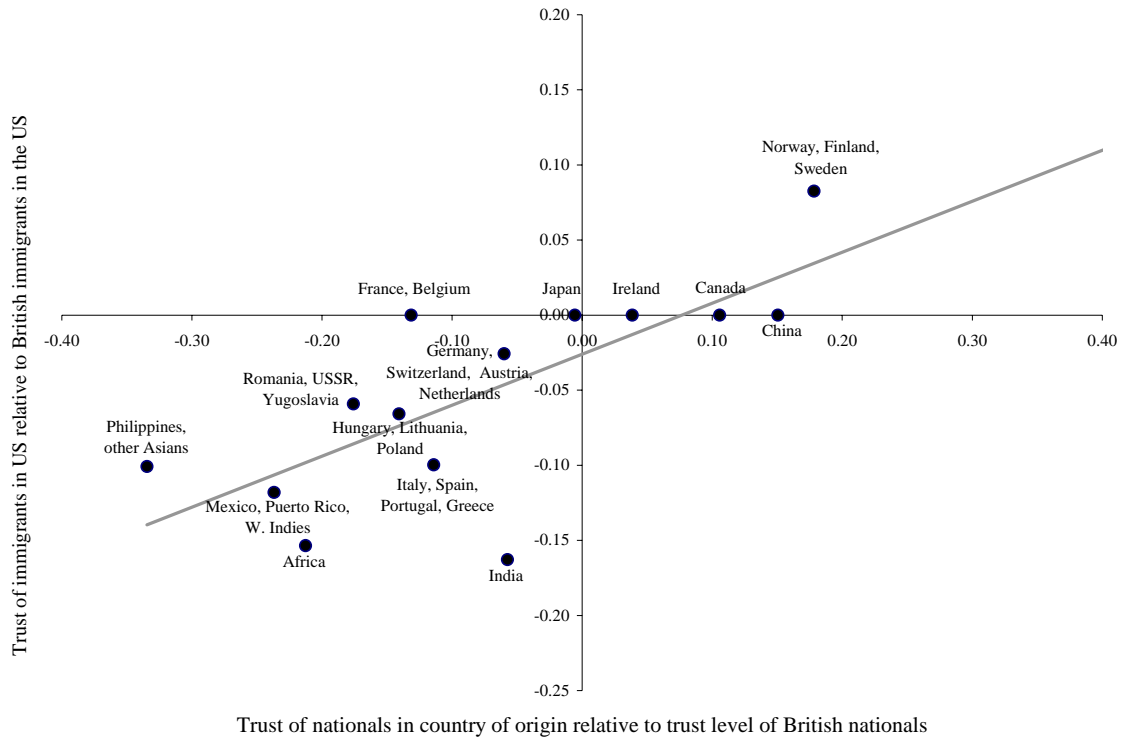
Source: General Social Survey.

Note: The bars represent the effect of different ethnic background on trust in percent of the sample mean of trust and relatively to “people with ancestors from the Great Britain”, the excluded group. Effects are obtained from a regression where the dependent variable is “trust in others”, i.e. a dummy variable equal to one if the respondent answered that most people can be trusted. Besides the ethnic origin dummies, the regression also includes demographic controls (health, gender, age, education, race), and religious affiliations (the omitted category is no religion and atheists). To identify the origin of the ancestors we use the answer to the question “From what countries or part of the world did your ancestors come?” and grouped together several countries of origin, as listed in the figure.



Figure 3

**Correlation between Trust of Country of Origin and Trust of Immigrants relative to Great Britain**

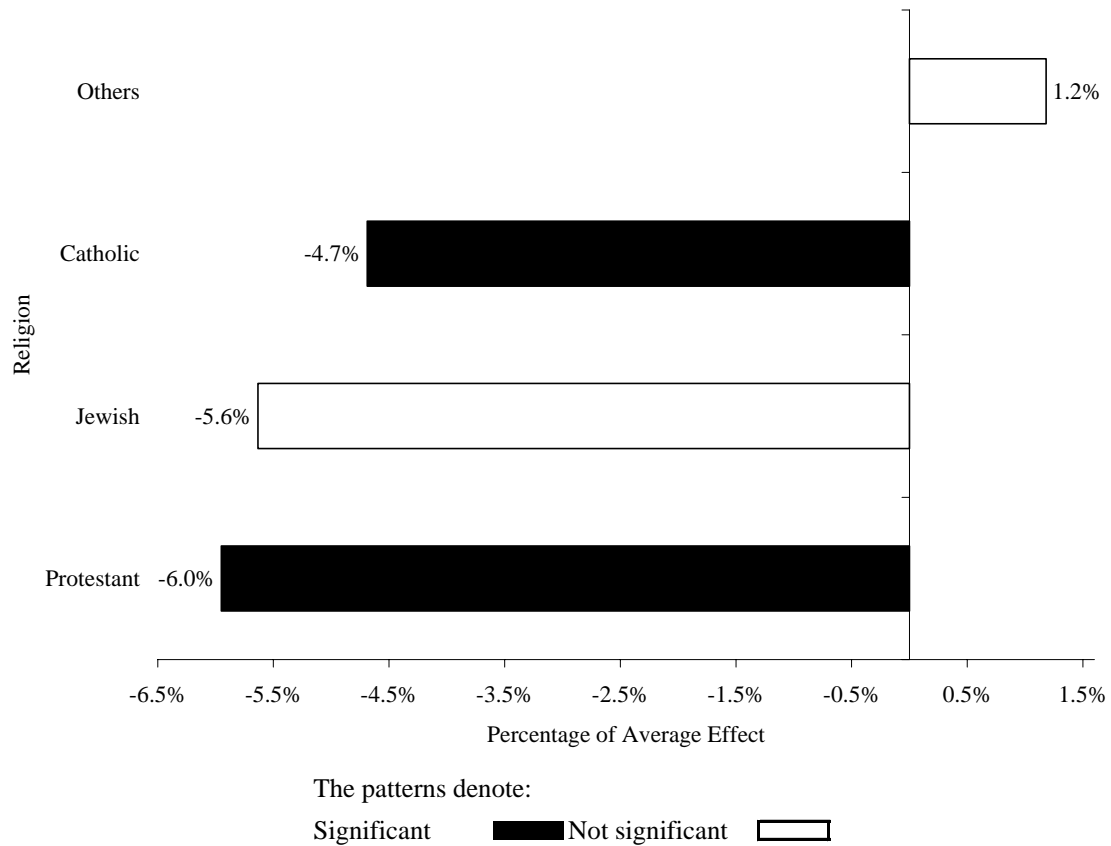


Source: World Values Survey, General Social Survey

Note: On the horizontal axis we report the difference between the average trust of each group of countries in Figure 2 and the average trust of Great Britain, computed using data from the World Value Survey. On the vertical axis we report the estimated effect of each ethnic group on trust, as reported in Figure 2.

Figure 4

### Religion and Preferences for Redistribution

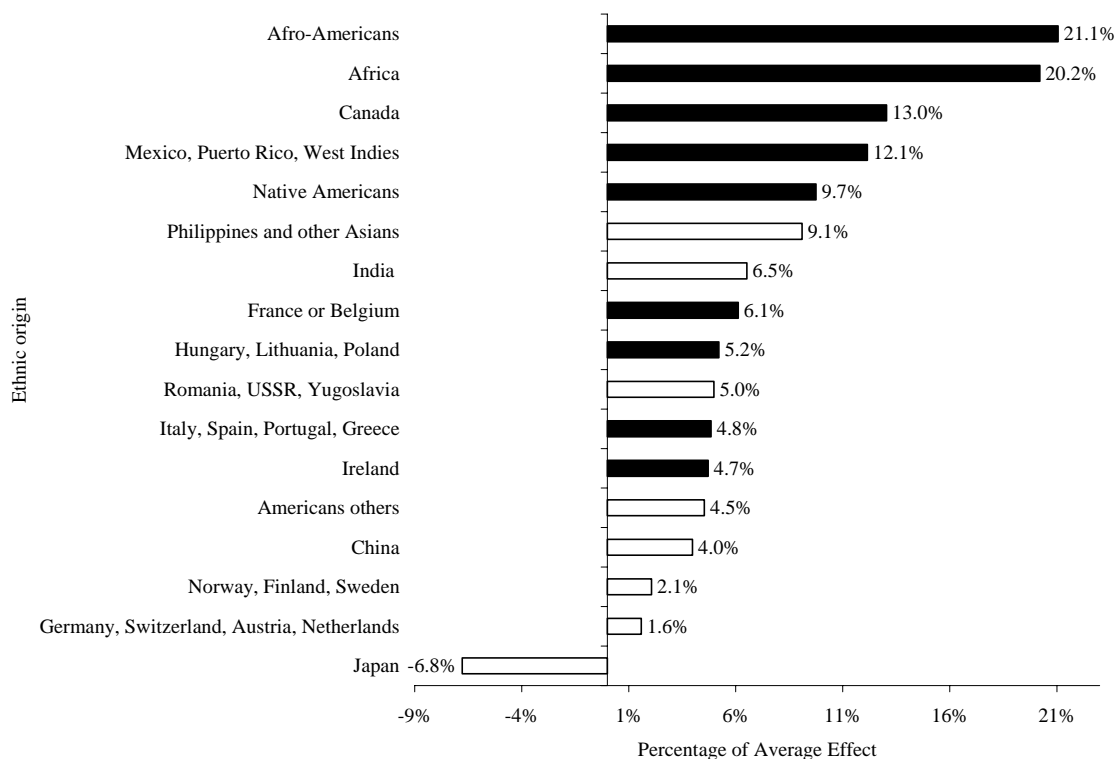


Source: General Social Survey.

Note: The bars represent estimated effects of various religious affiliations on preference for redistribution in percent of the average value of the dependent variable and relatively to the “no religious affiliation”, the excluded group. Effects are obtained from regression estimates where the dependent variable is the answer to the following question; “Some people think that the government in Washington ought to reduce the income differences between the rich and the poor, perhaps by raising the taxes of wealthy families or by giving income assistance to the poor. Others think that the government should not concern itself with reducing this income difference between the rich and the poor. [...] What score between 1 and 7 comes closest to the way you feel?” A higher number means stronger preferences for redistribution. Besides religion affiliation dummies the regression also includes demographic controls (health, gender, age, education, and race).

Figure 5

### Ethnic Origin and Preferences for Redistribution



The patterns denote:

Significant       Not significant     

Source: General Social Survey.

Note: The bars represent the effect of ethnic origin on preference for redistribution in percent of the average sample value of preference for redistribution and relatively to people with ancestors from Great Britain, the excluded group. Effects are computed from regressions where the left hand side variable is preference for redistribution. To identify the origin of the ancestors we use the answer to the question “From what countries or part of the world did your ancestors come?” and grouped together several countries of origin. Preference for redistribution is the answer to the following question; “Some people think that the government in Washington ought to reduce the income differences between the rich and the poor, perhaps by raising the taxes of wealthy families or by giving income assistance to the poor. Others think that the government should not concern itself with reducing this income difference between the rich and the poor. [...] What score between 1 and 7 comes closest to the way you feel?” A higher number means stronger preferences for redistribution. Besides the ethnic origin dummies, the regression includes demographic controls (health, gender, age, education, and race), religious affiliations (the omitted category is no religion and atheists) and dummy variables that indicate the origin of the ancestors of the respondent.

Table 1

**Probability of becoming and entrepreneur**

	Self Employed		
	OLS	OLS	IV
Trust	0.0151*** (0.0043)	0.0167*** (0.0046)	0.2380*** (0.0591)
Respondent is male	0.0708*** (0.0040)	0.0697*** (0.0043)	0.0659*** (0.0052)
Respondent is white	0.0438*** (0.0048)	0.0435*** (0.0051)	-0.0037 (0.0141)
Age of the respondent	0.0055*** (0.0007)	0.0049*** (0.0007)	0.0029*** (0.0011)
Age of the respondent - squared	-0.0000*** (0.0000)	-0.0000*** (0.0000)	-0.0000** (0.0000)
Education	-0.0096*** (0.0032)	-0.0068* (0.0035)	-0.0173*** (0.0048)
Education squared	0.0004*** (0.0001)	0.0003** (0.0001)	0.0004** (0.0002)
Income deciles dummies	NO	YES	NO
Observations	26,326	22,791	17,718

Source: General Social Survey.

Note: The dependent variable is a dummy variable equal to one if the respondent is a self-employed. The sample is restricted to respondents who report to be employed. "Trust" is a dummy variable equal to one if the respondent answered that most people can be trusted to the question: "Generally speaking, would you say that most people can be trusted or that you can't be too careful in life?" The regressions also include demographic controls (gender, age, education, and race). In column (2) the instruments are the religious denominations and the country of origin of the ancestors. Robust standard errors in parentheses account for clustering at country level. \*\*\* indicate the coefficient is different from zero at the 1% level, \*\* at the 5% level, and \* at the 10 % level.

Table 2

**Effects of culture on savings**

	National savings over GDP		
	OLS	OLS	IV
Do you consider to be especially important to encourage children to learn thrift and savings?		13.7014**	28.5369*
		(5.1744)	(16.0549)
Real growth rate of per capita GDP	1.4550***	0.9814**	0.4686
	(0.4188)	(0.4334)	(0.7008)
Dependency ratio	-0.6096***	-0.5741***	-0.5357***
	(0.1621)	(0.1534)	(0.1708)
Dummy if the country is not an OECD country	0.5561	0.5457	0.5345
	(2.0991)	(1.9788)	(2.1449)
Government savings (CCG saving: % of GNDI)	0.4199**	0.4377**	0.4569**
	(0.2012)	(0.1898)	(0.2067)
Observations	53	53	53
R-squared	0.581	0.636	0.572

Source: World Bank. See Giavazzi, Jappelli,, Pagano (2000) and World Values Survey 1981-1984, 1990-1993, and 1995-1997 (ICPSR 2790) and The World Christian Database (1990).

Note: The dependent variable is National Savings over GDP. “Important to encourage children to learn thrift and savings?” is based on the answer to the question: “Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important?” We coded the variable as 1 if the respondent lists as important “Thrift, saving money and things” and we took the country’s average response. All the regressions include real growth rate of per capita GDP, a dependency ratio (the sum of the country’s population over 65 and population under 15 over total population), a dummy for non OECD countries, and a measure of government savings). In column (3) the instruments are the percentage of people belonging to various religious denominations in each country. The denominations are Catholics, Protestants, Orthodox, Jewish, Muslims, Hindus, Buddhists and other affiliations. Standard errors are reported in parenthesis.\*\*\* indicate the coefficient is different from zero at the 1% level, \*\* at the 5% level, and \* at the 10 % level.

Table 3

**Effects of culture on income redistribution**

	Direct over indirect revenues			
	OLS	IV	OLS	IV
Population living in the state	0.7975	0.8042	0.6882	0.6796
	(0.8119)	(0.8090)	(0.7795)	(0.7575)
Percentage of population below the poverty rate	-0.0351***	-0.0359***	-0.0298**	-0.0316**
	(0.0119)	(0.0125)	(0.0125)	(0.0134)
Gdp Procapita in the State	-0.0002	-0.0006	0.0027	0.0019
	(0.0047)	(0.0048)	(0.0058)	(0.0062)
Should the government reduce income differentials? (1-7)	0.4423**	0.4762**		
	(0.2075)	(0.2318)		
It is the government responsibility to reduce differences in income? (1-5)			0.4481**	0.6265**
			(0.1898)	(0.2340)
Observations	45	45	45	45
R-squared	0.152	0.151	0.176	0.161

Source: U.S. Bureau of the Census, Current Population Survey, Annual Social and Economic Supplements

Note: The dependent variable is the ratio of total State income taxes and the sum of all the state indirect taxes (sales taxes, taxes on motor vehicles, and other indirect taxes). “Should the government reduce income differentials” is based on the state average answer to the following question; “Some people think that the government in Washington ought to reduce the income differences between the rich and the poor, perhaps by raising the taxes of wealthy families or by giving income assistance to the poor. Others think that the government should not concern itself with reducing this income difference between the rich and the poor. [...] What score between 1 and 7 comes closest to the way you feel?” A higher number means stronger preferences for redistribution. We calculated the year-state average in years 1980, 1983, 1984, 1986, 1987, 1988, 1989, 1990, 1991, 1993, 1994, 1996, and 1998, years for which the percentage of population in the state below the poverty rate is available. The variable “Is it the government responsibility to reduce differences in income?” is based to the state average answer to the following question “It is the responsibility of the government to reduce the differences in income between people with high incomes and those with low incomes.” The question was asked in 1987. The variable is coded 1–5, where a higher number represents stronger preferences for redistribution. In columns (2) and (4) the instruments are the percentage of people belonging to various religious denominations in the states and average percentage of people in the state who has ancestors from each of the origin. Standard errors are reported in parenthesis. \*\*\* indicate the coefficient is different from zero at the 1% level, \*\* at the 5% level, and \* at the 10% level.