DISCUSSION PAPER SERIES

No. 6403

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DEVELOPMENT ECONOMICS and LABOUR ECONOMICS

Centre for Economic Policy Research

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Available online at: **www.cepr.org/pubs/dps/DP6403.asp**

ISSN 0265-8003

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Yann Algan, Paris School of Economics, University Paris East
Pierre Cahuc, University Paris 1, CREST-INSEE, IZA and CEPR

Discussion Paper No. 6403
July 2007

Centre for Economic Policy Research
90–98 Goswell Rd, London EC1V 7RR, UK
Tel: (44 20) 7878 2900, Fax: (44 20) 7878 2999
Email: cepr@cepr.org, Website: www.cepr.org

CEPR Discussion Paper No. 6403

July 2007

ABSTRACT

Social Attitudes and Economic Development: An Epidemiological Approach*

In this paper we develop a new empirical approach to uncovering the impact of social attitudes on economic development. We first show that trust of second-generation Americans is significantly influenced by the country of origin of their forebears. In the spirit of the epidemiology literature, we interpret this phenomenon as the consequence of inherited social attitudes. We show that trust inherited by second-generation Americans from their country of origins has changed over time. This result allows us to use the inherited trust of second-generation Americans as a time-varying instrument to track back the evolution of trust in the home country of their parents. This strategy enables us to identify the specific impact of inherited trust on economic development relative to other traditional candidates, such as institutions and geography, by controlling for country fixed effects. We find that inherited trust has explained a substantial share of economic development on a sample of 30 countries during the post-war period, by improving total factor productivity and the accumulation of human and physical capital.

JEL Classification: F10, N13, O10 and P10
Keywords: economic development, growth, social capital and trust

Yann Algan
CEPREMAP, PSE
48 bv Jourdan,
75014, Paris
FRANCE
Email: yann.algan@cepremap.cnrs.fr

Pierre Cahuc
CREST-INSEE
Timbre J 360
15, Boulevard Gabriel-Peri
92245, Malakoff
FRANCE
Email: cahuc@univ-paris1.fr

* We thank Philippe Aghion, Olivier Blanchard, Eve Caroli, Raquel Fernandez, Francis Kramarz, Guy Laroque, Thomas Philippon and Sebastien Roux for comments. We are especially grateful to Luigi Guiso who gave us very helpful comments on empirical strategy. We are also indebted to Christian Morrisson and Fabrice Murtin who provided historical data on education. We thank seminar audiences at CREST, SED, Marseille University and Paris School of Economics.

Submitted 16 July 2007

1 Introduction

What are the fundamental causes of large differences in income per capita across countries? Although there is still little consensus on the answers to this question, a growing literature considers social attitudes, such as trust, as one of the main determinants of current economic development. As stressed by Arrow (1972, p. 357) "Virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period of time. It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence." A prerequisite for the successful development of market economies would be to depart from closed group interactions and to enlarge exchanges to anonymous others. In this regard, trust and trustworthiness appear as the keystone for successful economic development. This intellectual tradition dates back to Tocqueville (1835), Weber (1902), and to a case study by Banfield (1958) showing that amoral familism, that is lack of trust towards anyone not belonging to local groups, was associated with economic backwardness in Italian villages.[1] This view has recently been restated by economists by using cross-country correlations between income per capita and indicators of social attitudes based on individual social surveys (see La Porta et al., 1997, Knack and Keefer, 1997, Tabellini, 2005), or by using micro studies on developing countries (Platteau, 2000).

These contributions attempt to uncover the impact of social attitudes on economic development.[2] However, we still lack reliable estimates which isolate the impact of social attitudes on economic development independently of other factors already documented in the growth literature such as time-invariant institutions (Hall and Jones, 1999, Acemoglu et al., 2001, Rodrick, 1999, Djankov et al., 2002) or geography (Sachs, 2003). The main concern faced by studies trying to uncover the impact of social attitudes is that they are based on cross-sectional comparisons without any time-variation.[3] This makes it impossible to control for specific invariant national features which could codetermine both social attitudes and economic development.[4]

This issue clearly shows up even in the most detailed contributions which rely on time invariant instruments for social attitudes. For instance, in Tabellini's (2005) paper it is shown that variations in the literacy rate and the political institutions in place over the past several centuries are correlated with variations in trust at the end of the twentieth century. Using

[1] See also Coleman (1988), Fukuyama (1995), Gambetta (1988), Greif (1993), Nisbett (1996), Putnam (1993, 2000).

[2] This empirical approach is complemented by theoretical papers which analyze the intergenerational transmission of social attitudes. See Bisin and Verdier (2001), Hauk and Saez-Marti (2002), François and Zabojnik (2005), Benabou and Tirole (2006) and Tabellini (2007).

[3] See Fernandez (2006) and Guiso et al. (2006) for recent surveys.

[4] See Durlauf and Fafchamps (2005) for a survey on the empirical literature on trust and social capital.

instrumental variable techniques, the correlation between the historical variables observed at the end of the nineteenth century and the economic performance at the end of the twentieth century can be interpreted as a causal impact of trust on economic development. But this interpretation relies on two questionable assumptions. First, the literacy rate and the political institutions in place over the past several centuries is required to have no direct impact on economic performance at the end of the twentieth century. Second, all these variables must not be determined by common factors. Although Tabellini provides a very careful analysis of differences in performance of European regions including country fixed effects, the impossibility to include region fixed effects implies that cross-region correlations between trust and economic performance may come from unobserved region specific factors which codetermine trust and economic performance. This limit is inherent in the empirical strategy: since trust is assumed to be determined by historical variables which are fixed, it is not possible to account for variations in trust and to use the potential correlations between trust and economic performance across time by controlling for unobserved time invariant specific factors. It is thus still impossible to state whether social attitudes do matter *per se* or if they pick up the more fundamental influence of specific time invariant features such as the quality of institutions and the legal origins (Acemoglu et al., 2001, Djankov et al.,2002, Hall and Jones, 1999), the extent of fractionalization (Rodrick, 1999, Alesina et al., 2001) or geography (Sachs, 2003). Other studies using hierarchical religions (La Porta et al., 1997) or ethnic fractionalization (Knack and Keefer, 1997) as an instrument for social attitudes encounter exactly the same limit.

A more convincing empirical strategy would thus require exploiting the information contained in changes in trust across countries *and* over time. What we need is to find instruments for national social attitudes which are time-varying. That would make it possible to ensure that correlations between trust and economic performance are not determined by unobservable time invariant country specific factors by including country fixed effects. The temporal dimension of this problem is key since trust has been found to have dramatically changed over the past decades. Its sharp decline in some countries is at the heart of a growing literature in sociology and political science devoted to social attitudes.[5] Surprisingly, this issue has been ignored so far in the economic literature to explain the interplay between the dynamics of social capital and economic growth.

In this paper, we propose a new method to identify changes in trust across countries and over time. Our empirical strategy is based on the estimation of the inherited part of social attitudes which is not instantaneously overdetermined by the economic and institutional features of the country in which people are living. For that purpose, we show that social attitudes of second-

[5] Inglehart and Welzel (2005), Putnam (2000).

generation Americans are significantly influenced by the country of origin of their forebears.[6] In the spirit of the epidemiology literature,[7] we interpret this phenomenon as the consequence of inherited social attitudes. Looking at inherited social attitudes has many appealing features. First, the inherited part of social attitudes squares well with the notion of social capital, defined as a stock of values inherited from the previous period. This paper thus provides a direct measure of one dimension of the social capital stock, measured by inherited trust. Second, as long as this stock is transmitted across generations, the inherited part of trust of second-generation Americans should be closely correlated with trust in the home countries of people belonging to the same cohorts. Our strategy should thus deliver a relevant instrument for trust in the home countries. Last but not least, the level of inherited trust, as with any capital factor, is predetermined for a given period, but could evolve over time, increasing in some periods and depreciating in others. In that regard, since the parents of the second-generation Americans migrated at different periods, they are likely to have transmitted different social attitudes to their offspring. By looking at the inherited social attitudes of second-generation Americans belonging to different cohorts, we thus can find changes over time in our instrument for social attitudes, and isolate their specific impact on economic development relative to other time invariant national features.

We evaluate potential changes in the inherited trust of second-generation Americans by estimating the inherited trust of two separate cohorts of Americans: those who belonged to the working age population between 1949-52 and those who belonged to the working age population in 2000-2003. It turns out that inherited trust has changed over time: the influence of the country of origin on the trust of people who were born in the United States depends on the period of arrival of their forebears. It also appears that changes in the level of trust inherited

[6] See the excellent surveys of Fernandez and Fogli (2005) and Guiso et al. (2006) on the impact of culture on economic behavior. The potential influence of the country of origin of the ancestors on US born people has been analyzed by Reimers (1985), Blau (1992), Rice and Feldman (1997), Carroll et al. (1999), Antecol (2000), Guinnane et al. (2002), Giuliano (2004), Fernandez and Fogli (2005) and Algan and Cahuc (2005). Blau (1992) and Guinnane et al. (2002) examine whether the fertility of immigrants differs from that of the native born in the US. Reimers (1985) and Antecol (2000) study the effect of the country of origin on the labor force participation of immigrants. Rice and Feldman (1997) analyze trust and civic attitudes. Using the same approach, Giuliano (2004) focuses on family leaving arrangements and Fernandez and Fogli (2005) analyze female labor participation and fertility. Caroll et al. (1999) use this approach for the analysis of saving behavior, finding no significant link between the country of origin and saving rates. Algan and Cahuc (2005) look at family values. Most of these studies find a significant influence of the country of origin on attitudes, behavior and economic outcomes. The persistence of inherited behavior is also documented for other countries. For instance, Guiso et al. (2004) show that households are more likely to use checks, invest less in cash and more in stock, have higher access to institutional credit, and make less use of informal credit in high-social-capital areas of Italy. They also show that the behavior of movers is still affected by the level of social capital of the province where they were born. Alesina and Fuchs-Schuendeln (2005) and Dohmen et al. (2006) evaluate the influence of attitudes inherited from parents on current attitudes with different methodologies. They find a strong influence of parents on the attitudes of children.

[7] We borrow this terminology from Raquel Fernandez (2006).

from the country of origin of people born in the United States are in line with changes in the level of trust in the corresponding home countries when we look at the same two cohorts who were working in the 1950's and the 2000's. These findings suggest that the trust inherited from the country of origin of people born in the US is potentially a good instrument for the trust of people who live in the home countries. Obviously, the level of trust of people born in the United States can be determined by country specific factors that also influence economic performance and trust in their country of origin. For instance, it might be the case that Americans whose ancestors came from highly developed countries inherited a high level of trust, and that the past high level of development also has a positive influence on future trust and economic performance in the country of origin. The value-added of our empirical strategy is precisely to enable us to control for such factors by the inclusion of country fixed effects and indicators on the past level of economic development in the home country at the time when the parents' immigration took place.

This strategy allows us to show that there is a significant impact of trust on income per capita for 30 countries over the period 1949-2003. The set of countries covers all the regions of the world, with European countries, North American countries, Asian countries and the African and Latin American continents. We find that developing countries such as African countries, taken as a whole, would have been able to double their output per capita between the 1950's and the 2000's if they had had the same level of inherited trust as that of the Swedish people. The impact is also economically sizeable since a country like Germany would have an income per capita 15 percent higher in the 2000's if the level of inherited trust of German people had been identical to that of the Swedish people. Eventually, we show that the main channels through which inherited trust affects income per capita is total factor productivity and incentives to accumulate physical and human capital. And the magnitude of such aggregate effects of trust is linked to strong positive social interaction effects between individuals prone to cooperation.

The paper is organized as follows. The estimation strategy is presented in section 2. Data are described in section 3. The results are presented in section 4. Section 5 presents our conclusions.

2 Estimation strategy

What is the impact of social attitudes on macroeconomic performance? To answer this question, one has to deal with the issue of endogeneity at stake in the estimation of the following equation

$$Y_{ct} = \alpha_0 + \alpha_1 S_{ct} + \alpha_2 X_{ct} + F_c + F_t + \varepsilon_{ct} \tag{1}$$

where Y_{ct} stands for indicators of macroeconomic performance (including, in alternative specifications, income per capita and its different components: capital stock per capita, employment

rate, human capital and total factor productivity) in country c at period t. The variable S_{ct} measures the country average of social attitudes of working age individuals, conditional on their individual characteristics such as age, number of years of education, employment status and religious affiliation; X_{ct} denotes a vector of average characteristics of the population and past economic development of the economy; F_c stands for country fixed effects capturing all other time invariant specific features such as legal origins or past institutions with long-lasting effects; F_t stands for period fixed effects common to all countries; ε_{ct} denotes an error term. The inclusion of country fixed effects ensures that the correlation between economic performance and attitudes is not driven by unobservable country time invariant specific factors.

The problem with equation (1) is that contemporaneous social attitudes are likely to be correlated with the unobserved error term ε_{ct}. For instance, individuals who live in a more secure environment are likely to trust others more and to be more efficient. To tackle this issue, we need to explain how social attitudes are determined. Recent studies by Bisin and Verdier (2001), Bisin, Topa and Verdier (2004), Benabou and Tirole (2006) and Tabellini (2007) stress the role of two main forces. A part of social attitudes is shaped by the contemporaneous environment and another part is shaped by inherited attitudes from earlier generations. This suggests positing the following model

$$S_{ct} = \gamma_0 + \gamma_1 S_{ct-1} + \gamma_2 X_{ct} + \Phi_c + \Phi_t + \nu_{ct} \tag{2}$$

where Φ_c and Φ_t stand for country and time dummies respectively; $S_{c,t-1}$ denotes the average attitudes of the previous generation and ν_{ct} is an error term.

In equation (2), it is assumed that current social attitudes of individuals of working age are determined by all factors likely to influence economic performance and by the social attitudes of the previous generation. This assumption has key implications for the definition of the different periods t on which our econometric analysis should focus. In particular, we have to look at periods which are separated by sufficiently large gaps to account for changes in average social attitudes across generations that do not overlap. The analysis is focused on two periods and then two cohorts: Americans who were born in the US between 1884 and 1934 and between 1935 and 1985. The analysis of these groups leads us to focus on people who belonged to the working age population (between 18 and 65 years old) in two periods: 1949-1952 and 2000-2003 respectively, without any overlap between the two cohorts. [8]

The restriction that social attitudes of the working age individuals of the past generation are

[8] Since we use the World Value Survey which provides information only on people who are more than eighteen years old, we consider that the working age population is made up of people aged from eighteen to sixty five years old. Accordingly, people who were working between 2000-2003 were born between 1935 and 1985, and people who were working in 1949-1952 were born during the period 1884-1934.

excluded from the economic performance equation (1) allows us to identify, together with the assumption that $\varepsilon_{ct} \perp S_{ct-1}$, the parameters of the system of equations (1) and (2). This restriction can be consistent to the extent that the variables which account for current characteristics of the economy are included in the right-hand side of the economic performance equation (1) and that the forty-eight years gap between the two dates t is large enough. However, as stressed by Tabellini (2005), the problem of this specification is that we do not have any information on S_{ct-1}, since standardized cross-country databases on social attitudes of earlier generations are not available.

To cope with the lack of information on social attitudes of the previous generation, we propose the following alternative strategy. We replace the variable S_{ct-1} by the average (conditional on individual characteristics) social attitudes that second-generation Americans inherited from country c. At first glance, this strategy makes sense to the extent that if social attitudes inherited from country c in the US are correlated with contemporaneous social attitudes in the corresponding home country c, it is because people whose forebears originate from the same country share common past social attitudes. Therefore, it seems relevant to assume that the correlation between average social attitudes of people whose forebears were born in country c and average social attitudes of people currently living in country c reflects the causal impact of such common past social attitudes, independently of ε_{ct}, the current shocks on macroeconomic performance in country c.

This estimation strategy relies on two assumptions that are worth describing more precisely.

1. First, it is assumed that $\tilde{S}_{ct}$, the conditional average of trust of the working-age people in period t, who live and were born in the US and whose parents immigrated from country c, follows a transmission process across generations similar to that of equation (2), that is:

$$\tilde{S}_{ct} = \tilde{\gamma}_0 + \tilde{\gamma}_1 S_{ct-1} + \tilde{\Phi}_t + \tilde{\nu}_{ct}, \tag{3}$$

   where $\tilde{\nu}_{ct}$ denotes an error term. Let us denote by $t = 1$ and $t = 2$ the period 1949-1952 and 2000-2003 respectively. It is shown, in appendix A, that this assumption about the transmission of trust allows us to estimate an equation similar to equation (2) in the period 2000-2003, where we replace, on the right hand side, the conditional average of trust of people of working age living in country c in the period 1949-1952, S_{c1}, by the conditional average of trust that second-generation Americans of working age inherited from country c in the period 2000-2003, denoted by $\tilde{S}_{c2}$. Note that we could use the same substitution in equation (2) for the period 1949-1952. We would replace S_{c0}, the conditional average of trust of the generation which was of working age in 1898-1901, which appears in the

right hand side of equation (2) written in the period 1949-1952, by $\tilde{S}_{c1}$, the inherited trust of Americans during the period 1949-1952. Yet, if this approach is useful to estimate the model in the period 2000-2003, it is not possible at this stage to estimate the model in all periods since there are no available data on the social attitudes of working-age people in the period 1949-1952.

2. In order to uncover the level of trust of working-age people in the period 1949-1952, we rely on potential cohort effects in social attitudes. Empirical studies using the General Social Survey have shown that American born at different times exhibit different levels of trust, controlling for age and period (Putnam, 2000, Robinson and Jackson, 2001). This means that trust is influenced by cohort effects. Denoting by S^0_{c2} the average of trust of "old" people (who are no longer in the working age population in period 2000-2003, i.e. who were born between 1884 and 1935) who live in country c in period $t = 2$, we assume that

$$S^0_{c2} = \pi_0 + S_{c1} + \xi_{c2}, \tag{4}$$

where ξ_{c2} is an error term. Importantly, we do not impose that social attitudes should remain constant within a cohort. In that regard, we do not instrument trust of the previous generation S_{c1} by the trust of the current old generation S^0_{c2}. It would not be a valid instrument since social attitudes within a generation can change due to specific country shocks ξ_{c2} which also affect current economic performance, that is $corr(\xi_{ct}, \varepsilon_{ct}) \neq 0$. Therefore, we use the same approach as in assumption 1. We assume that $\tilde{S}^0_{c2}$, the conditional average of trust of "old" people who were born in the US and originate from country c, is determined by the model:

$$\tilde{S}^0_{c2} = \tilde{\pi}_0 + \tilde{S}_{c1} + \tilde{\xi}_{c2},$$

where $\tilde{\xi}_{c2}$ is an error term which is likely to be independent of the error term ε_{ct} that appears in the economic performance equation (1). It is shown in appendix A that this assumption allows us to estimate an equation similar to equation (2) in the period 1949-1952 where $\tilde{S}_{c1}$ (that was used as a substitute for S_{c0}), the conditional average of social attitudes of working-age people living in the US in the period 1949-1952, is replaced by the conditional average of social attitudes of "old" people living in the US in the period 2000-2003.

In what follows we apply our estimation strategy to evaluate the causal impact of trust on economic performance. Before presenting the results, let us first look at the data.

3 Data description

In this section, we discuss the data used to measure social attitudes and to identify inherited social attitudes from the country of origin of people born in the United States. We also look at historical data on economic development for time periods and countries that match the data on social attitudes. Our analysis covers the period 1949-2003. The sample consists of 30 countries: Algeria, Argentina, Austria, Belgium, Canada, China, Colombia, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Mexico, Morocco, Netherlands, Nigeria, Norway, Philippines, Poland, Portugal, Puerto Rico, Spain, Senegal, Sweden, United Kingdom and Zimbabwe.

3.1 Social attitudes and inherited social attitudes

Social attitudes of individuals born in the United States are provided by the *General Social Survey* database (GSS). This database covers the period 1972-2004 and provides information on the birth place and the country of origin of the respondent's forebears since 1977. The GSS variable for the country of origin reads as follows: "*From what countries or part of the world did your ancestors come?*" Origins cover almost all European countries: Austria, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Spain, Sweden, and the United Kingdom. The GSS database also reports Latin American countries: Mexico, Puerto Rico, and a broad category labelled "Latin American countries with Spanish origins". Information on Asian origin is available for: China, India and the Philippines. Additionally, the GSS also reports two broad categories for Arabic origins or African origins.

To measure cultural transmission of social attitudes across generations, we use information on the waves of immigration. Respondents are asked if they are born in the United States and how many of their parents and grand-parents were born in the country. The question on parents birthplace is scaled 0 if both parents are born in the US, 1 if only the mother is born in the US, and 2 if only the respondent's father is born in the country. The answer on grand-parents birthplace is scaled from 0 to 4 indicating the number of grandparents born in the US. This information makes it possible to disentangle four potential waves of immigrations: fourth-generation Americans (all grand-parents born in the US), third-generation Americans (all grand-parents immigrated to the US and all parents were born in the US), second-generation Americans (all parents immigrated to the United States) and first-generation Americans. This database offers the possibility of tracking back the cultural transmission of social attitudes by disentangling the different waves of immigration.

Social attitudes in the home countries are measured by the *World Value Survey* (WVS) database. The WVS covers three main waves (1980, 1990, 2000) for the same set of countries defined as potential country of origin in the GSS database. We reconstruct the categories African and Latin American origin by clustering corresponding countries in the WVS database. For African countries, we use information on the West Coast with Senegal since the slave trade mainly took place in this part of the continent. We also include the two additional available African countries, Nigeria and Zimbabwe, for more recent waves of immigrations. The two available Arabic countries are Algeria and Morocco. And regarding Latin American countries with Spanish origins, we select the available corresponding countries including Argentina and Colombia.

Finally, social attitudes are measured by the level of interpersonal trust. We use the following question provided by the WVS and GSS databases: "*Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?*". The answers are given on a scale from 1 to 3, which corresponds to "Most people can be trusted", "Can't be too careful", "Depends". We construct a *trust* indicator equal to one if the respondent answers that people can be trusted and 0 if she answers that one should be careful (after deleting the answers "do not know"). The choice of this question about mutual trust is motivated by two reasons. First, the cross country correlation between trust, as measured by this question, and economic performance has been widely documented. This allows us to reassess the economic role of trust when a causal relation is identified. Second, this is the only question on social attitudes for which we have a sufficiently large number of observations in the GSS database to implement our empirical strategy.

In Appendix - Table 12, we report the summary statistics for second-generation Americans. The sample provides at least 30 observations per country of origin. The most representative groups came from Italy (471 observations), Germany (331 observations), United Kingdom (268 observations) or Latin America (360 observations from Mexico, 211 observations from Puerto Rico and 196 observations from other Spanish Latin American origins). The level of trust is on average 39.87 percent with a standard deviation of 48.8 percent. Trust varies dramatically by country of origin: from only 18.2 percent and 19.9 percent among people with Puerto-Rican origins or African origins, to 56.4 percent and 78.8 percent among second-generation Americans with Swedish or Danish origins. The respondents in our sample of second-generation Americans are on average 51.3 years old, 43 percent are men, with on average 12.3 years of education and 52 percent are employed, 45 percent are inactive and 3 percent are unemployed. Note that second-generation Americans with European origins are much older than their counterparts coming from developing countries. In Appendix - Table 13, we report the summary

statistics for the corresponding home countries which are taken from the WVS database for the waves 1980, 1990, 2000. The sample of countries of residency is made up of at least 1000 observations for each country and the demographic characteristics are quite similar to that of second-generation Americans. The average level of trust in the home countries is 31.8 percent, which is approximately 7 percentage points lower than that of second-generation Americans. Yet the cross-country variation is similar to that found among second-generation Americans coming from different countries of origin, the standard deviation reaching 46.5 percent.

3.2 GDP, Physical Capital, Human Capital, Employment and TFP

Economic performance is measured by income per capita expressed in 1990 US dollars. Data borrowed from Maddison cover the period 1820-2003. We consider two periods: 1949-1952 and 2000-2003. These periods are chosen so that people who belonged to the working age population in each period are born at dates that do not overlap. We also assess the main channels through which social attitudes are likely to affect economic development, including physical capital, human capital, employment and total factor productivity. Human capital is measured by the average number of years of education provided by Morrisson and Murtin (2005). Data on the physical capital stock are constructed as follows. We draw on the Easterly and Levine database (2001) which provides capital stock figures from 1951 to 1990.[9] The database is completed by using data on the investment share of GDP, provided by the Penn World Tables, to calculate total investment. Then, we calculate TFP as a standard Solow residual by assuming an identical share of capital and labor across countries. All variables are defined in 1990 US dollars. Data are averaged over the periods 1949-1952 and 2000-2003. The average macroeconomic performances of the countries of our sample are reported in Appendix - Table 14.

4 Results

We first document the influence of the country of origin on trust of second-generation Americans. Second, we show that inherited trust of second-generation Americans is correlated with trust in the home countries. Then, we estimate the impact of trust on economic development by using the inherited trust of second-generation Americans as an instrument for trust in their home country. We run over-identification tests to check the validity of this instrument. We also decompose the channels through which trust is likely to influence macroeconomic performance by distinguishing its impact on physical capital, human capital, labor force and total factor productivity. Finally, we provide evidence that the strong macroeconomic impact of inherited

[9] The capital stock is computed from investment flows with the depreciation rate provided by Easterly and Levine (1999). The initial capital stock in 1951 is also borrowed from Easterly and Levine.

trust on economic development depends on social interactions: trust fosters cooperation only to the extent that trusting individuals interact with people who share the same high level of trust and are prone to cooperate with each other.

4.1 Inherited social attitudes in the US

Measure of inherited social attitudes

In order to measure how second-generation Americans varied in their social attitudes depending on their country-of-ancestry, we run an individual level probit regression on the answers to the trust question: "*Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?*". The dependent variable is equal to one if the respondent thought that most people can be trusted and zero otherwise. In addition to country-of-ancestry dummies, we also control for age (age squared), sex, education, income, employment status and religious affiliation. We also use information on the level of education of the parents of the respondents. This information might be crucial since potential correlation between social attitudes and ethnic heritage might transit through parents' characteristics such as human capital rather than culture per se. All estimations include year dummies to control for specific temporal shocks. All standard errors are corrected for clustering at the country level. Americans with Swedish ancestors are taken as the reference group.

Table 1 reports the marginal effects of the country-of-ancestry dummies for Americans who were born in the United States between 1935 and 1985. Marginal effects are computed with the remaining variables evaluated at their means. In this first step, we select all Americans belonging to this cohort, whatever the wave of immigration of their forebears. Since most individual characteristics are likely to be endogenous as regards the level of trust, Table 1-Col.1 first reports the results when only demographic variables (age and gender) are taken into account. Column 1 shows that the fact of having forebears coming from a different country of origin than Sweden always has a statistically significant effect at the 1 percent level on social attitudes. The gap is the most sizeable for Americans with African origins, Latin American origins and Indian origins, the probability of trusting others being reduced by 33 percent, 29 percent and 25 percent by comparison with Americans with Swedish forebears. Respondents with Mediterranean origins and Eastern European origins come next. For instance, the fact of having Italian origins reduces by 12 percent the level of trust in comparison to people with Swedish origins. Respondents with Continental European origins also tend to be less trusting than Americans with Swedish forebears, but the gap is less sizeable. German or Austrian origins would reduce by 7.2 percent and 6.6 percent respectively social attitudes. The fact of having forebears from the UK also leads to a lower level of trust but the gap with Sweden amounts to

only 1.8 percent. Finally, people whose forebears came from other Nordic countries tend to have comparable or slightly higher levels of trust.

Table 1-Col.2 reports the marginal estimates of inherited attitudes when the full set of other individual controls is taken into account. Strikingly, the coefficients associated with the country of origin are still highly significant and remain fairly unchanged. Table 2 reports the corresponding marginal effects associated with individual controls. As expected, the level of trust increases with the level of education, the level of education of parents (but only transmitted by the mother), the level of income, age, and the fact of being employed rather than unemployed. But apart from education, no other individual controls are statistically significant. In particular, no significant statistical relation with individual trust shows up. This finding raises concern about the possibility of explaining and instrumenting social attitudes by religious affiliation in aggregate panel data.

Changes in inherited social attitudes

Table 3 reports the marginal effects of country of origin dummies for second-generation Americans. We distinguish the two cohorts of Americans who were born between 1885-1934 and 1935-1985. Only controls for demographic variables are included at this first stage. To make the comparison between cohorts meaningful, we drop countries of origin for which we have less than 15 observations. For both cohorts, the country-of-ancestry dummies are highly significant and economically sizeable. Coefficients vary from -37 percent (Philippine origins) to 39.8 percent (Danish origins) for second-generation Americans born between 1884 and 1934 and they vary from -26 percent (African origins) to 2.1 (Dutch origins) for second-generation Americans born between 1935 and 1985. It is instructive to notice that inherited trust for respondents whose parents came from France, Germany or the United Kingdom was higher than that of people with Swedish origins as far as the older cohort (born between 1884 and 1934) is concerned. By contrast, inherited trust seems to have deteriorated compared to people with Swedish origins regarding the younger cohort of people born between 1935 and 1985.

We do not investigate how the history of each country could explain changes in social attitudes. Such an investigation would require knowing exactly when the respondent's ancestors came to the United States to identify whether or not the ancestors witnessed major national crisis. The GSS database does not provide such information. Yet, the parents of the two cohorts are likely to have undergone very different national crises. The majority of respondents who belong to the cohort born between 1884-1934 is likely to be made up of individuals whose parents did not undergo the two World Wars, contrary to the individuals born between 1935-1985. The social attitudes of immigrants from countries deeply involved in these wars, such as France

or Germany, have thus deteriorated between these two cohorts compared to descendants from Sweden, since this latter country is one of the few European countries which was not affected by the two wars. This finding would be consistent with those obtained by Alesina and Ferrara (2002) who show that a history of traumatic experience is associated with low trust.

4.2 Inherited social attitudes in the home countries

This section examines the correlations between inherited social attitudes of second-generation Americans and social attitudes in the home country of their parents. This analysis is a key step in our empirical approach, since a significant correlation between the two variables is required to use the social attitudes of second-generation Americans as an instrument for social attitudes in the home country of their parents. We proceed in two steps. First we analyze the correlation between inherited trust of second-generation Americans in the United States and trust in the corresponding home countries. Then, we check that the social attitudes of first-generation immigrants are in line with those of their country of origin to make sure that the observed correlation between the inherited trust of second-generation Americans in the United States and trust in the corresponding home countries is not an artifact.

4.2.1 Inherited trust and trust in the home country

We start by looking at the cross-section correlation between inherited trust in the United States and in the home countries. Figure 1 illustrates the basic correlation between the marginal effect of the country of residency and the marginal effect of the country of origin on the level of trust. The correlation is displayed for the cohort born between 1935 and 1985 (the same correlation pattern holds for the other cohort). The marginal effect of the country of residency on social attitudes is derived from probit estimates on the WVS database in the wave 2000. We control for the same demographic individual characteristics as those used in the estimation of the marginal effect of the country-of-ancestry in the GSS database. As it happens, there is a positive relation between inherited trust of second-generation Americans and that of the same cohort living in the home country, the R-squared reaching 0.51. Figure 1 suggests that parents who migrated to the United States have transplanted their level of trust to their children in much of the same way as parents who stayed instead in the home country did. More rigorous analysis below confirms this phenomenon.

Table 4-Col.1 & 2 reports GLS regressions of the cross-section correlation between the level of trust of second-generation Americans and that of people currently living in their country of origin. We run these estimations on the two cohorts of people born between 1884-1934 and 1935-1985 taken together. The dependent variable is the level of trust in the country of origin

Table 1: Marginal effect associated with the country of origin of Americans: Probit estimates

	Trust in others=1			
	Americans born between 1935-85			
country of origin	(1) : No controls		(2): Controls	
	Coeff	Std Error	Coeff	Std Error
Africa	-.337***	(.000)	-.302***	(.002)
Arab	-.113***	(.001)	-.042***	(.005)
Austria	-.066***	(.001)	-.031***	(.006)
Belgium	-.046***	(.002)	.045***	(.002)
Canada	-.109***	(.000)	-.086***	(.001)
China	-173***	(.008)	-.169	(.012)
Czech Republic	-.109***	(.000)	-.103***	(.006)
Denmark	-.036***	(.000)	-.041***	(.000)
Finland	.057***	(.001)	.065***	(.001)
France	-.077***	(.000)	-.050***	(.001)
Germany	-.072***	(.000)	-060***	(.000)
Greece	-.091***	(.001)	-.092***	(.002)
Hungary	-.085***	(.000)	-.097***	(.001)
India	-.252***	(.001)	-.251***	(.002)
Ireland	-.068***	(.000)	-.050***	(.001)
Italy	-.129***	(.000)	-.118***	(.003)
Japan	-.064***	(.002)	-.077***	(.002)
Latin America other	-.295***	(.001)	-.280***	(.001)
Mexico	-.174***	(.001)	-.116***	(.002)
Netherlands	-.109***	(.000)	-.083***	(.002)
Norway	.053***	(.000)	.064***	(.000)
Philippines	-.129***	(.002)	-.136***	(.003)
Poland	-.078***	(.000)	-.081***	(.000)
Portugal	-.093***	(.000)	-.096***	(.002)
Puerto Rico	-.349***	(.000)	-.327***	(.001)
Spain	-.071***	(.000)	-.054***	(.001)
Sweden	Reference			
Switzerland	-.021***	(.001)	.033***	(.001)
United Kingdom	-.026***	(.000)	-.037***	(.001)
Individual controls	Age, Age^2, Sex		Full specification	
Pseudo-R^2	.051		.085	
Observations	9651		9507	

Marginal effects with robust standard error.
General Social Survey: ***:1%, **: 5%, *: 10%

Table 2: Marginal effect associated with individual characteristics

Trust in others=1 Cohorts 1935-85		
Controls	Coeff	Std Error
Age	.009***	(.003)
Age2	-.000	(.000)
Men	.020*	(.010)
Education	.042***	(.002)
Education mother	.013***	(.011)
Education father	-.000	(.001)
Income category	.033	(.029)
Unemployed	Reference	
Employed	.057	(.037)
Inactive	.043	(.031)
Protestant	Reference	
Catholic	.001	(.019)
Muslim	.042	(.275)
Jew	-.015	(.048)
Buddhist	.026	(.075)
No religion	-.004	(.010)
Marginal effects with robust standard error.		
GSS : ***:1%, **: 5%, *: 10		

measured by the marginal effect of each country with Sweden as the country of reference. The explanatory variable is the marginal effect of the country of origin on the level of trust of second-generation Americans, where second-generation Americans with Swedish origins constitute the reference group. The coefficients are those displayed in Table 3. Table 4 - Col. 1 first shows the correlation without any controls. Table 4 - Col. 2 includes the initial average gap in the level of GDP per capita in the home country relative to Sweden at the time the forebears immigrated. Controlling for initial GDP is key in as much as this variable could co-determine both inherited attitudes transmitted by the previous generation to their offsprings in the United States and the current gap in GDP in the corresponding home countries relatively to Sweden. Thus, including this variable should dampen our concern that inherited attitudes could affect the current GDP gap by other channels than trust. In the first specification, the coefficient of correlation is fairly high, reaching .859, and significant at the 1 percent level. The magnitude of the correlation is lowered by more than half when the lagged value of the gap in GDP per capita relative to Sweden is included. But the coefficient is still statistically significant at the one percent level.

We then assess to what extent the within evolution of trust among the two cohorts of Americans who belong to the working age group in 1949-1952 and 2000-2003 is correlated with the evolution of trust among the same two cohorts who were living in the corresponding home

Table 3: Marginal effect associated with the country of origin for the cohorts 1884-1934 and 1935-1985.

	Trust in others=1			
	Second-generation Americans		Second-generation Americans	
country of origin	Born between 1884-1934		Born between 1935-1985	
	(1)		(2)	
	Coeff	Std Error	Coeff	Std Error
Africa	-.258***	(.015)	-.260***	(.006)
Arab			-.061***	(.013)
Austria	.068***	(.011)	-.205***	(.006)
Canada	-.015	(.019)	-.134***	(.003)
China	-.063***	(.028)	-.125***	(.008)
Czech Republic	.034	(.010)	-.237***	(.010)
Denmark	.398***	(.007)	-.031**	(.018)
Finland	.022***	(.011)		
France	.169***	(.015)	-.090***	(.006)
Germany	.002	(.012)	-.179***	(.006)
Greece	-.285***	(.015)	-.052***	(.005)
Hungary	.050***	(.011)	-.184***	(.006)
India	-.056***	(.024)	-.138***	(.008)
Ireland	.063***	(.003)	-.026***	(.005)
Italy	-.118***	(.012)	-.129***	(.003)
Latin America other	-.345***	(.012)	-.246***	(.008)
Mexico	-.313***	(.019)	-.237***	(.009)
Netherlands	.020***	(.003)	.021*	(.011)
Norway	.161***	(.001)	-.040***	(.009)
Poland	.007	(.012)	-.110***	(.001)
Philippines	-.373***	(.005)	-.193***	(.005)
Portugal	.092***	(.027)	-.214***	(.002)
Puerto Rico	-.191***	(.027)	-.279***	(.008)
Spain	-.307***	(.017)	-.097***	(.008)
Sweden			Reference	
United Kingdom	.010	(.010)	-.087***	(.004)
Pseudo-R^2		.051		.061
Observations		845		956

Marginal effects with robust standard error. General Social Survey: ***:1%, **: 5%, *: 10%

countries. If parents do transfer their social attitudes to their offsprings in a similar way, regardless of whether they still live in the home country or have immigrated to the United States, a significant positive correlation in variations in social attitudes across the two cohorts should show up in the home country and in the United States.

Table 4 - Col. 3 and Col. 4 document this within correlation by controlling for country fixed effects. It is worth stressing that country fixed effects also enable us to capture all time invariant country features which could influence inherited trust for second generation Americans and people currently living in the home countries of their parents. The dependent variable of the regression is still the level of trust of people living in the home country of the parents captured by marginal effects of the country of residency relative to Sweden. The explanatory variable is the level of trust of second-generation Americans measured by the marginal effect of countries of ancestry relative to Swedish origins. Table 4 - Col. 3 reports the within correlation without controlling for the gap in lagged GDP per capita while Table 4 - Col. 4 includes it. In both cases, the within correlation is positive and highly significant at the one percent level, suggesting that inherited trust of second-generation Americans is a relevant instrument for explaining the level of trust in the home countries.

It is worth stressing that the coefficient associated with inherited trust is dramatically reduced by the inclusion of lagged GDP. This result suggests that past economic performance has a significant influence on current trust in addition to time-invariant national features. This point illustrates that high levels of past education or of past income favor the development of cooperative attitudes. Moreover, we also find that country fixed effects have a statistically significant and economically sizeable impact on current trust. This last point highlights the value-added of our approach which uses a time-varying instrument for trust and thus makes it possible to account for other fundamental determinants of social attitudes captured by fixed effects.

Table 4: Estimated effect of inherited attitudes on current national social attitudes. GLS Estimations.

Dependent variable	Trust of nationals in country of residency			
	(1)	(2)	(3)	(4)
Trust of second-generation Americans by country-of-ancestry	.859*** (.000)	.310** (.157)	.381*** (.000)	.207*** (0.002)
Lagged gap of GDP per capita	No	Yes***	No	Yes***
Country dummies	No	No	Yes***	Yes***
Observations	47	45	47	45

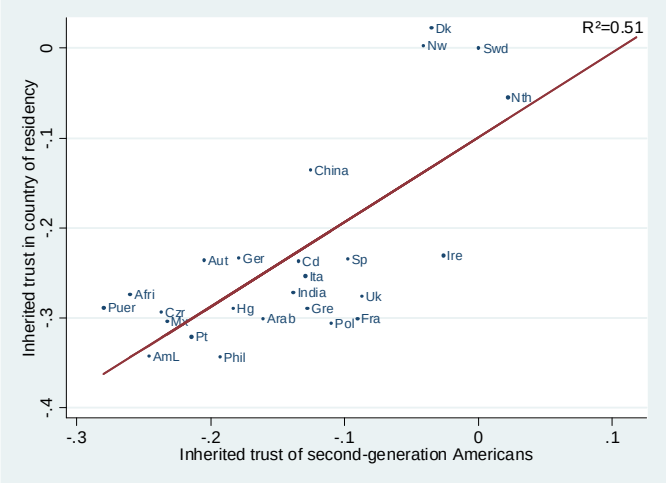

Figure 1: Trust of second-generation Americans by country of origin relative to trust of nationals in country of residency. *Note*: Marginal effect from probit estimates on WVS and GSS databases.

4.2.2 Social attitudes of immigrants and sample selection

A potential issue raised by our strategy is that our sample of immigrants might not be representative of the home countries' populations. Their social attitudes and other socio-economic characteristics may differ significantly from those of their country of origin at the time of their arrival in the US. The most direct test to check the representativeness of the migrants consists in focusing on first-generation Americans, that is immigrants who were born in their home country and migrated to the United States. We then compare their individual level of trust and their characteristics with those of their counterparts who are living in the corresponding home country. The comparison is run on the working age population over the period 1977-2002 for the GSS database, providing data for the United States, and the waves 1980, 1990 and 2000 for the WVS database which provides information for the home countries.

Figure 2 reports the correlation between trust of immigrants and that of people remaining in home countries, controlling for individual characteristics including age, age squared, education, income category, policy orientation and employment status. Countries of origin with less than 15 observations in the GSS database have been dropped to ease the comparison. As it happens, the correlation is fairly high, leading to a R^2 =62.5 percent. These results show that the social attitudes of first generation immigrants are indeed strongly correlated with those of people living in their country of origin. This correlation is consistent with the impact of the country of origin on the social attitudes of the second-generation American found above.

Table 5: Transmission of trust across generations

	Trust in others=1							
Country of origin	Fourth-generation (1)		Third-generation (2)		Second-generation (3)		First-generation (4)	
	Coeff	Std Error	Coeff	Std Error	Coeff		Coeff	
Africa	-.257***	(.001)	-.235***	(.020)	-.273***	(.012)	-.280***	(.005)
Arab			.039*	(.023)	-.051*	(.025)	-.184***	(.014)
Austria	.085***	(.011)	.065***	(.006)	.047***	(.004)	-.107***	(.009)
Canada	.009	(.002)	.032*	(.017)	.025**	(.012)	-.185***	(.007)
China			-.317***	(.027)	-.119***	(.023)	-.203***	(.012)
Czech Rep.	-.077***	(.000)	-.205***	(.008)	.033*	(.005)	-.074**	(.027)
Denmark	.021***	(.001)	.132**	(.013)	.402*	(.004)	-.219***	(.017)
Finland	-.013***	(.002)	-.122***	(.016)	.092*	(.011)		
France	.023***	(.001)	-.104***	(.009)	-.035**	(.015)	-.184***	(.014)
Germany	.027	(.001)	-.010*	(.005)	-.085***	(.005)	-.134***	(.013)
Greece			-.337***	(.005)	-.168***	(.012)	-.115***	(.010)
Hungary	.033***	(.002)	-.124***	(.013)	-.018***	(.006)	-.044***	(.015)
India					-.162***	(.021)	-.223***	(.012)
Ireland	.008***	(.001)	-.017***	(.003)	.051***	(.006)	-.101***	(.014)
Italy	-.023***	(.001)	-.197***	(.013)	-.083***	(.006)	-.202***	(.012)
Latin Am	-.260***	(.002)			-.260***	(.014)	-.295***	(.007)
Mexico	-.031***	(.002)	-.178***	(.020)	-.181***		-.255***	(.013)
Netherlands	-.046***	(.002)	-.115***	(.013)	.081***	(.009)	.034	(.026)
Norway	.126***	(.001)	.128***	(.012)	.140***	(.003)	.089***	(.022)
Poland	.019	(.000)	-.053***	(.014)	-.050***	(.004)	-.158***	(.012)
Philippines					-.229***	(.014)	-.282***	(.006)
Portugal	.236***	(.005)	.048**	(.022)	-.131***	(.013)	-.132***	(.017)
Puerto Rico	-.272***	(.001)	-.305***	(.028)	-.235***	(.017)	-.243***	(.014)
Spain	-.048***	(.001)			-.097***	(.017)	-.189***	(.009)
Sweden	Reference							
U.K	.043	(.002)	-.054***	(.009)	-.016**	(.008)	-.123***	(.019)
Pseudo-R^2	.0961		.085		.0865		.087	
Observations	7176		855		1924		1580	

Marginal effects with robust standard error. GSS: ***:1%, **: 5%, *: 10%

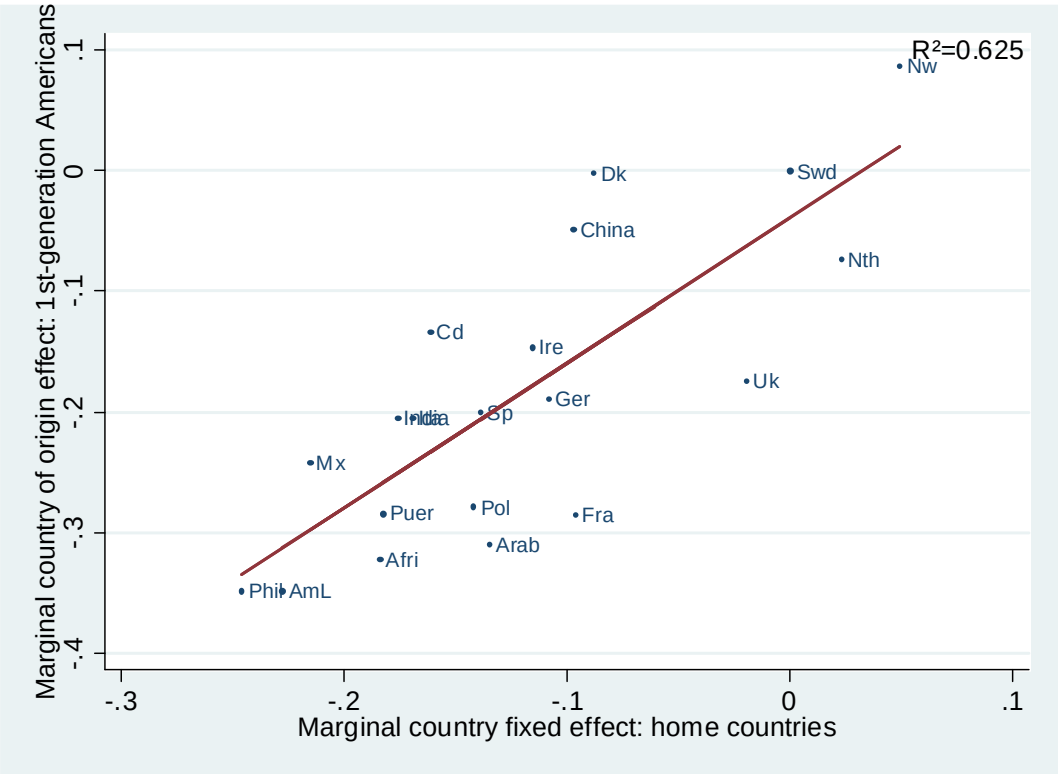

Figure 2: Correlation between trust of first-generation Americans and trust in home countries. Source: GSS 1977-2002, WVS 1980-200.

4.3 The impact of inherited social attitudes on macroeconomic performance

4.3.1 GDP per capita

This section documents the impact of social attitudes on economic development by estimating the system of equations (1) and (2) written as follows:[10]

$$\Delta Y_{ct} = \alpha_1 \Delta S_{ct} + \alpha_2 \Delta X_{ct} + F_c + \Delta \varepsilon_{ct}, \tag{5}$$

$$\Delta S_{ct} = \delta_1 \Delta \tilde{S}_{ct} + \delta_2 \Delta X_{ct} + \Phi_c + \Delta \nu_{ct}, \tag{6}$$

where the operator Δ stands for the differences between the value of the variable and its value in Sweden. In the benchmark estimation, Y_t denotes GDP per capita measured in 1990 dollars for the period $t = 1$ (1949-1952) and $t = 2$ (2000-2003). The variable S_{ct} measures the country average of social attitudes of the working age individuals who were born between 1884-1934 (for $t = 1$) and 1935-1985 (for $t = 2$), conditional on their individual characteristics; X_{ct} denotes lagged GDP per capita; F_c and Φ_c stand for country fixed effects. Inherited social attitudes of second-generation Americans are denoted by $\tilde{S}_{ct}$.

Main results

Since social attitudes in the home countries are likely to be biased by reverse causality, we instrument social attitudes in the home countries by inherited attitudes $\tilde{S}_{ct}$ of second-generation Americans belonging to the same two cohorts in equation (6). In line with our previous estimation strategy, social attitudes in home countries ΔS_{ct} are measured by the marginal effects of the country of residency on trust relative to Sweden. Similarly, social attitudes of second-generation Americans, $\Delta \tilde{S}_{ct}$, are measured by the marginal effect of their country of origin on trust relative to second-generation Americans whose parents immigrated from Sweden. The coefficients correspond to those displayed in Figure 1. ΔX_{ct} is the lagged gap in GDP per capita relative to Sweden (namely the GDP gap in 1900-1903 for the period 1949-1952 and the GDP gap in 1949-1952 for the period 2000-2003). Moreover we also control for country fixed effects in equations (5) and (6).

Three stage Least Square (3SLS) estimates of the system of equations (1) and (2) are reported in Table 6. Panel A reports the second stage estimation of the coefficient α_1, panel B gives the corresponding first stage regression for the coefficient δ_1, and panel C reports basic GLS regressions of current GDP and social attitudes in the home countries. Table 6-Col. 1 reports the correlation between trust and the gap in GDP per capita relative to Sweden without any

[10] The exact form of the system of equations that is estimated is presented in equations (A9)-(A12) in appendix A.

additional controls for both the first stage and the second stage regressions. Column 2 includes the lagged value of the gap in GDP per capita in both regressions. Column 3 includes country dummies and assesses the within effect of changes in trust on variation in the gap of GDP per capita relatively to Sweden. In all specifications, the instrument for trust in the home countries is significant at the 1 percent level and the implied IV estimated effect of trust on GDP per capita is also significant at the 1 percent level.

Table 6: IV Regressions of GDP per capita

	(1)	(2)	(3)
Panel A: Dependent variable: GDP per capita (3SLS)			
Trust in home countries	25843***	38579***	30238***
	(3086)	(7114)	(9261)
Lagged gap in GDP per capita		Yes***	Yes***
Country dummies	No	No	Yes***
Adj-R^2	.563	0.856	0.888
Panel B: Dependent variable: Trust in home countries (3SLS)			
Trust of second-generation Americans	.865***	.3864***	.208***
by country-of-ancestry	(.145)	(.076)	(.067)
Lagged gap in GDP per capita		Yes***	Yes***
Country dummies	No	No	Yes***
Adj-R^2	.421	0.956	0.973
Panel C: Dependent variable: GDP per capita (GLS)			
Trust in home countries	22328***	5757*	23561***
	(2785)	(3113)	(8168)
Lagged gap in GDP per capita		Yes***	Yes*
Country dummies	No	No	Yes***
Observations	45	43	43

These results show that IV estimated effects of trust on GDP are sizeable. To illustrate the quantitative impact of social attitudes on GDP per capita, Figure 3 displays the change in GDP per capita in period 2000-2003 that countries would have experienced if the level of inherited trust in a given country had been the same as that prevailing in Sweden during that period.[11] This Figure shows that GDP per capita in 2000 would have been increased by more than 100 percent in Africa and India if the level of inherited trust among the working age population had been the same as in Sweden by that time, controlling for initial level of GDP per capita in 1950 and for time invariant country fixed effects. Africa and poor countries such as India and China

[11] The change in GDP per capita is equal to $-\alpha_1\delta_1\hat{S}_{ct}^{US}$ where the estimated value of the coefficients α_1 and δ_1 are taken from Table 6-Col 3, Panels A and B.

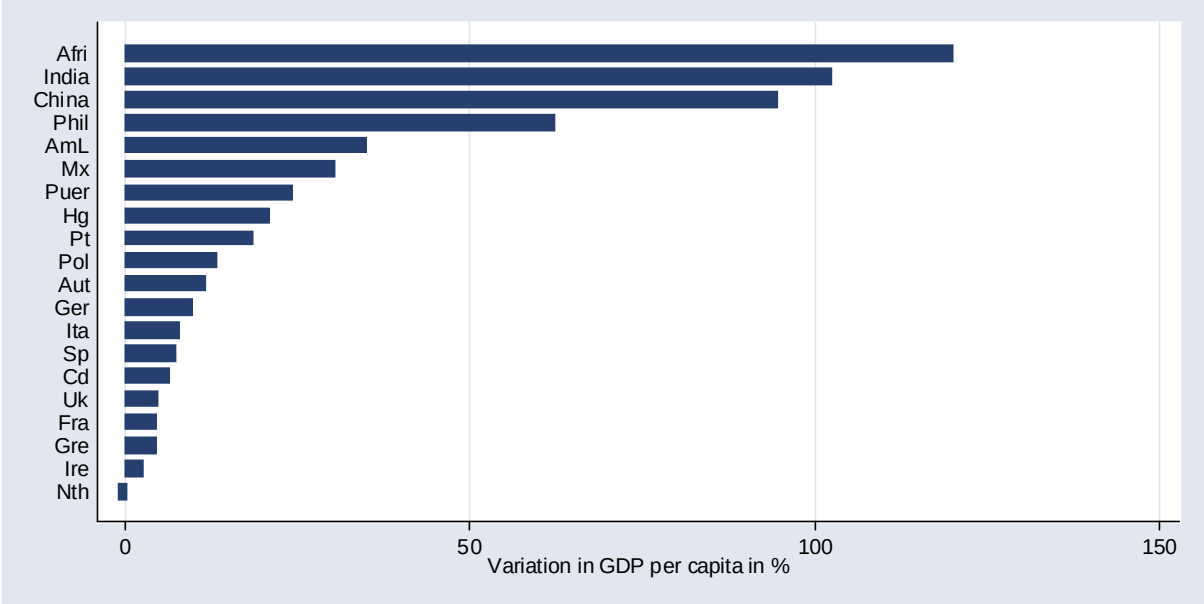

Figure 3: Predicted variations in GDP per capita in period 2000-2003 if the level of inherited trust of people in working age were the same as in Sweden, controlling for country fixed effects.

are obviously extreme cases. It is well documented that these developing countries are plagued by an important lack of interpersonal trust. As Banfield (1958), Fafchamps (1996) or Platteau (2000) have argued, traditional societies are characterized by pervasive intra-group trust and do not extent this trust to anonymous interactions. The functioning of markets is drastically limited when trust is circumscribed to small groups. But Figure 3 shows that inherited trust has also a non negligible impact on GDP per capita in developed countries. European countries such as France or the United-Kingdom would increase their GDP by 5 percent if the level of inherited trust was the same as in Sweden.

Figure 4 illustrates the impact of inherited trust on GDP per capita from another perspective. This Figure displays the reduction in the GDP per capita gap relative to Sweden that would occur if the level of inherited trust was the same as in Sweden during the period 2000-2003 (for countries whose GDP per capita is lower than Sweden). This Figure merely shows that differences in inherited trust explain a relatively small part of the differences in GDP per capita between developing countries and developed countries. Although Figure 3 shows that the income per capita would have been much higher in developing countries if people had inherited the same level of trust as the Swedes, Figure 4 indicates that the increase in income would have been too small to reduce the major part of the gap in income between developing and developed countries. In other words, there is a very important lack of inherited trust in developing countries which

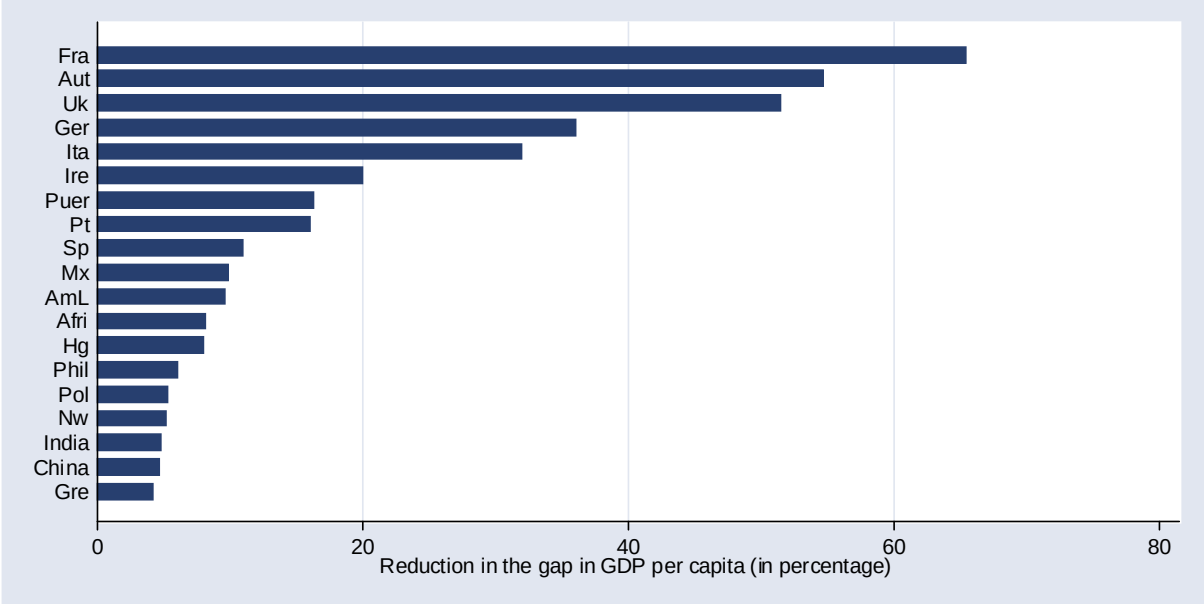

Figure 4: Reduction (in percentage) in the gap in GDP per capita with respect to Sweden if the level of inherited trust of people of working age were the same as in Sweden in the period 2000-2003.

exerts a significant negative impact on income per capita. However, this lack of inherited trust explains only about 5 percent of the income per capita difference between China and India on one hand and Sweden on the other hand in the period 2000-2003. For Africa, this figure amounts to about 10 percent.

The role of country fixed effects

Our approach adds new insights on the impact of social capital on economic development to the extent that previous studies found correlations between trust and economic performance, but without controlling for national time invariant specificities (La Porta et al., 1997, Knack and Keefer, 1997, Tabellini, 2005). In that regard, it is instructive to reassess the link between trust and GDP per capita in our framework but without controlling for country fixed effects. The comparison of Figures 3 and 5 shows[12] that the impact of inherited trust on GDP per capita would have been overestimated by a factor of three if the country fixed effects were not controlled for. It is evident that the inclusion of country fixed effect is of first importance. Accordingly, it is necessary to account for changes in social capital and use time-varying instruments for trust in order to isolate the specific contribution of social capital in growth.

[12] In Figure 5 the change in GDP per capita is equal to $-\alpha_1 \delta_1 \hat{S}_{ct}^{US}$ where the estimated value of the coefficients α_1 and δ_1 are taken from Table 6-Col 2, Panels A and B.

It is also worth discussing how our results are related to the literature providing alternative candidates for explaining the role of specific national features. The emphasis has been put mainly on two candidates: institutions and geography. Institutions, in particular property rights and rule of law, have been found to limit rent-seeking or rent-extracting behavior and provide the incentives for individuals and firms to invest in productive activities. Hall and Jones (1999) found an overwhelming effect of social infrastructures on the cross-country heterogeneity in output per worker. They defined social infrastructures as a composite index of government anti-diversion policies and the Sachs and Warner (1995) indicator on the openness of a country to other countries. Hall and Jones did control for potential reverse causality by using instrumental variables such as distance to equator or primary languages. Acemoglu et al. (2001) provided additional evidence on the role of the quality of institutions on the economic development of previous colonies by instrumenting extractive institutions with the mortality rate of settlers. Conversely, Sachs (2003) claimed that geography could have a much more direct effect on income through diseases such as malaria, rather than just an indirect effect through institutions.

All these studies provide a careful econometric treatment of potential reverse causality channels. Yet they are based on cross-country comparison and cannot control for country fixed effects since they use time invariant instruments for institutions and geography. They thus face a problem of potential co-determination of their explanatory variable with other more fundamental invariant national features. This raises concern about the fundamental causality channel between an identified institutional or geographical factor and growth. Rodrick (1999) stressed this major concern in his study on the consequences of fractionalization and inequality on growth. Using time invariant indicators at the national level, Rodrick was able to include dummies only at the regional level rather than at the country level. He concluded with disappointment that these regional dummies remain highly significant after the introduction of proxies for fractionalization, inequality and property rights enforcement. This suggests that these explanatory variables are likely to be no longer statistically significant if country fixed effects were to be included.

Our strategy helps to solve this problem by accounting for changes in social capital. It is important to stress that we do take into account all the institutions and geographical factors provided in the previous literature. Since the institutions mentioned above are time invariant, they are captured by our country fixed effects. But our country dummies also capture any institutional factors that are imperfectly measured by the existing indicators or any other potential omitted invariant national features. We are thus able to disentangle the specific causal channel from social attitudes relative not only to institutions and geography but also to any other potential invariant national factors.

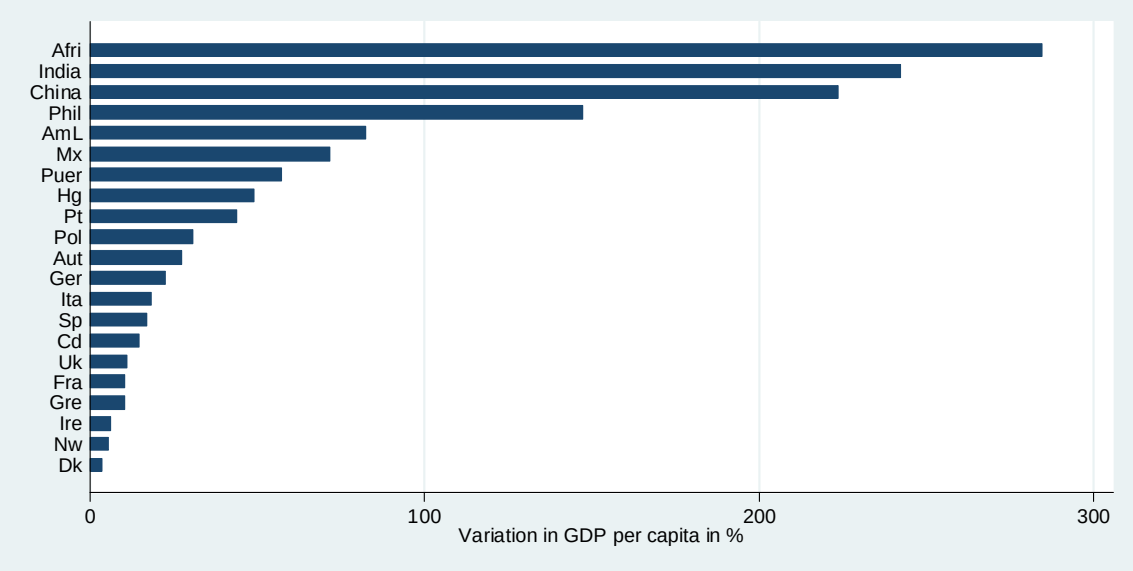

Figure 5: Predicted variations in GDP per capita in period 2000-2003 if the level of inherited trust of people in working age were the same as in Sweden, without controlling for country fixed effects.

4.3.2 Overidentification tests

We investigate the validity of our macroestimates by using overidentification tests. Our instrumental strategy is relevant only as long as inherited social attitudes of second-generation Americans are truly exogenous as regards economic development in the home countries. We thus look for additional instruments to be able to perform overidentification tests. For that purpose, we use social attitudes of Americans whose wave of immigration is older than the second-generation. We select all Americans in the GSS database who answered that either their parents or grand-parents were born in the Unites States. This allows us to focus on the third wave, the fourth wave or older waves of immigrations of Americans. We can presume that the effect of potential omitted variables, which could co-determine both social attitudes of Americans whose wave of immigration is higher than the second-generation and the contemporaneous economic development in the home countries, would be more insignificant than those at work with social attitudes of second-generation Americans. Accordingly, we check whether the inherited social attitudes of second-generation Americans are exogenous with respect to current macroeconomic performance in their home country under the assumption that the inherited social attitudes of Americans whose wave of immigration is older than the second-generation are truly exogenous.

To select older waves of immigration, we use the question on the birthplace of parents. We focus on respondents who say that they were born in the United States and that both of their parents were also born in this country. This sample thus gathers Americans belonging to a wave of immigration older or equal to the third wave. We then proceed as in the previous section by distinguishing two cohorts among this sample: people who belonged to the working age population (18-65 years old) in 1949-1952 or in 2000-2003. To estimate the marginal effect of the country of origin on social attitudes of these cohorts of Americans, we run exactly the same probit estimate on the probability that they answer yes to the question: "*Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?*". In addition to country-of-ancestry dummies, we still control for age (age squared), sex, education, income, employment status and religious affiliation. Swedish ancestors are still considered as the reference group.

The results of the overidentification tests are reported in Table 7. Column (1) gives the first stage estimates of the effect of social attitudes of the two cohorts of Americans, whose wave of immigration is older than the second generation, on social attitudes of the people belonging to the same cohorts in the home countries. Column (2) reports the second stage estimates of social attitudes on economic development. We report the estimates with country fixed effects and the lagged values of GDP per capita to dampen as much as possible any issue of omitted variables. But the overidentification tests lead to the same conclusion without these additional controls. Column (1) shows that inherited social attitudes of Americans whose wave of immigration is older than the second-generation are significantly positively correlated with social attitudes in the home countries. The correlation is statistically significant at the one percent level and the size is of the same order as the previous one with inherited social attitudes of Americans of second generation. Column (2) shows that this new instrument has an economically sizeable and statistically significant effect on the GDP per capita in the home countries. Moreover, the coefficient associated with social attitudes in the second stage regression is of the same order of magnitude as the one found in Table 6 - Column 3.

Finally, we perform different tests of overidentification. We first perform a χ^2 overidentification test assessing whether the 3SLS coefficient for GDP per capita estimated with the inherited social attitudes of Americans whose wave of immigration is higher than the second-generation is significantly different than the one estimated using these inherited social attitudes together with those of second-generation Americans. Table 7 - Column (3) reports the corresponding two stage coefficient associated with the impact of trust on income per capita. The effect is statistically significant at the one percent level. The bottom of Column (3) reports the p-value for the null hypothesis of equality of coefficients associated with the economic effect of trust

depending on the two different specifications in the first stage. The null-hypothesis of equality of the second stage coefficients in the two different specifications cannot be rejected at the 10 percent level. Furthermore Table 7 - Column (4) reports an easy-to-interpret test consisting in directly adding our instrument for social attitudes of second-generation Americans in the second stage regression. The first stage estimate has been obtained by using trust of Americans whose ancestors came from later waves of immigration as the only instrument. As shown in Table 7 - Column (4), inherited trust of second-generation Americans has a statistically insignificant direct effect on GDP per capita and this direct effect would come with a negative sign when we already control for another instrumented value of social attitudes in the home countries.

Table 7: Overidentification restriction - Aggregate estimates

	(1) First stage	(2) Second stage	(3) Second stage	(4) Second stage
	Trust in home countries	GDP per capita in home countries	GDP per capita in home countries	GDP per capita in home countries
Trust in home countries		42291.37***	41989.22***	44350.34***
		(9437.352)	(8872.57)	(8299.228)
Trust of second generation Americans				- 5894.65
				(4015.02)
Trust of Americans from older waves of immigration	.492***			
	(.124)			
Adj-R^2	.977	.898	.919	.920
Overident. test p-value (χ^2test)			[0.891]	
Observations	43	43	43	43

3SLS estimates. Period: 1949-1952 and 200-2003. Col. (2) and (4) use social attitudes in the home countries instrumented by trust of Americans whose wave of immigration is older than the second generation. Col. (3) use social attitudes in the home countries instrumented by trust of second-generation Americans and trust of Americans from older waves of immigration.
All specifications control for country fixed effects and lagged values of GDP per capita

4.3.3 Decomposition of the impact of social attitudes

The previous section has shown that differences in inherited trust have a strong direct impact on differences in GDP per capita. But inherited trust may influence economic performance through different channels such as investment, employment and the overall efficiency of labor and capital. In order to identify these channels, let us assume that output is produced with a Cobb Douglas

technology:

$$Y_{ct} = A_{ct} K_{ct}^{\alpha} (h_{ct} L_{ct})^{1-\alpha}$$

where $Y_{ct}, A_{ct}, K_{ct}, L_{ct}$, and h_{ct} refer to output, total factor productivity, capital, employment and average level of education in the population in country c at time t. This equation yields a simple relation between the cross-country log-differences in output per capita and the cross-country differences in the employment population ratio and in the technological parameter, which reads:

$$\Delta y_{ct} = \Delta a_{ct} + \alpha \Delta k_{ct} + (1-\alpha)(\Delta h_{ct} + \Delta \ell_{ct}) \tag{7}$$

where $\Delta y_{ct} = \log(Y_{ct}/N_{ct}) - \log(Y_{\bar{c}t}/N_{\bar{c}t})$ stands for the difference between the log of GDP per capita in country c in period t and the log of GDP per capita in the reference country denoted by $\bar{c}$ (which is still Sweden) during the same period. The similar definition holds for $\Delta k_{ct} = \log(K_{ct}/N_{ct}) - \log(K_{\bar{c}t}/N_{\bar{c}t})$, $\Delta \ell_{ct} = \log(L_{ct}/N_{ct}) - \log(L_{\bar{c}t}/N_{\bar{c}t})$ and $\Delta h_{ct} = \log(h_{ct}) - \log(h_{\bar{c}t})$. Differences in total factor productivity read $\Delta a_{ct} = \log(A_{ct}) - \log(A_{\bar{c}t})$. Total factor productivity is calculated as the traditional Solow residual of equation (8).

As stressed in the previous section, causality could run in both directions between social attitudes and the factors of production. Education may strengthen trust for instance if the roots of distrust lie in ignorance (Banfield, 1958) or if educational policies put the emphasis on teaching the students how to behave cooperatively. Similarly, higher employment rates are associated with more efficient labor markets and could breed trust.

To tackle this issue, we follow the previous strategy by running 3SLS estimates on the system of equations (5) and (6), the dependent variables of equation (5), are respectively $\hat{y}_{ct}$, $\Delta k_{ct}, \Delta h_{ct}, \Delta \ell_{ct}$ or Δa_{ct}. Importantly, we include country fixed effects in these regressions which could pick up the influence of national institutions and infrastructures. Such country fixed-effects might be important since Hall and Jones (1999) showed that social infrastructures account for the main part of total factor productivity. Similarly, the quality of property rights could significantly affect the incentives to accumulate physical and human capital.

Table 8 reports the 3SLS estimated effect of social attitudes on Δy_{ct}, $\Delta k_{ct}, \Delta h_{ct}, \Delta \ell_{ct}$ and Δa_{ct} over the two periods 1949-1952 and 2000-2003. The coefficients of the first stage regression of national trust on inherited trust are statistically significant and of the same order of magnitude as the previous ones. The first striking result is that inherited trust has a positive impact on every component of the changes in GDP per capita: it steadily increases both the capital stock, the employment rate, the average years of education and the level of total factor productivity. For each input, the coefficient associated with trust is significant at the 1 percent level even when one controls for the lagged gap in income per capita and country dummies (except for

employment, where trust becomes significant at the 5 percent level). Second, Table 8 shows that the main channels through which social attitudes affect production is total factor productivity and physical and human capital accumulation. Actually, 34 percent (8.084 over 23.681) of the impact of inherited trust on GDP per capita is due to differences in total factor productivity. The impact of inherited trust on differences in education, measured by the number of years of schooling, explains about 34 percent (11.710 time the coefficient $1-\alpha$, equal to $0.7 = 8.19$ over 23.681), and the impact of trust through physical capital accounts for 27 percent of the differences in income per capita. The influence of employment is by comparison much more marginal since it explains the residual 5 percent of differences in income per capita.

This accounting exercise provides new insight on the economic effect of social attitudes. By comparison with Hall and Jones (1999), we show that social attitudes which are not embedded in invariant institutions, such as their social infrastructures indicator, also have a major effect on total factor productivity. Next, we found a new significant impact of social attitudes on total factor productivity and capital accumulation when the causality link is properly accounted for. This result is at odds with the findings of Keefer and Knack (1997) based on the correlation between national indicators of trust and the factors of production. In particular, the latter authors found that the coefficient associated with trust was in general not statistically significant in explaining production inputs when they included the proxies for social infrastructures of Hall and Jones (1999). We show that controlling for reverse causality and changes in social attitudes is key for understanding the incentives to innovate and to accumulate physical and human capital.

Table 8: Decomposition of the impact of social attitudes on production inputs: 3SLS estimates. Trust in home countries is instrumented by trust of second-generation Americans, lagged GDP gap and country dummies.

3SLS Estimates	GDP	Capital	Employment	Education	TFP
	(1)	(2)	(3)	(4)	(5)
Trust in home countries	23.681***	21.106***	1.671**	11.710***	8.084***
	(3.612)	(4.427)	(.719)	(1.709)	(2.324)
Lagged gap in GDP	-1.776***	-1.719***	-.170**	-1.168***	-.438***
	(.433)	(.5539)	(.086)	(.204)	(.291)
Country dummies	Yes***	Yes***	Yes***	Yes***	Yes***
Adj-R^2	.836	.858	.834	.856	.645
Observations	45	42	45	45	42

4.4 The role of social interactions

It is likely that the strong macroeconomic impact of inherited trust on economic development relies on social interactions: trust fosters cooperation only to the extent that trusting individuals interact with people who share the same high level of trust and are prone to cooperate with each other. This section provides tentative evidence of such social interactions in trust which could explain its sizeable macroeconomic effect. We look at the relationship between individual economic performance and social interactions between individual trust and average national trust. We run this analysis for different indicators of individual economic performance available in the WVS database. The analysis is based on the working age population for the waves 1980, 1990 and 2000. For cross-country empirical analysis, we run regressions of the following type:

$$y_{ict} = a_0 + a_1 s_{ict} + a_2 s_{ict} S_{ct} + a_3 x_{it} + f_{ct} + e_{ict} \tag{8}$$

where y_{ict} stands for an indicator of economic performance of individual i in country c at date t. The variable s_{ict} measures individual level of trust, S_{ct} measures the country average level of trust and the product $s_{ict}S_{ct}$ captures social interactions in trust. The variable x_{it} denotes a vector of individual characteristics such as gender, age, level of education, marital status and religious affiliation. Lastly we control for other time varying national effects f_{ct} and e_{ict} is an error term.

In lines with the previous macro-estimates, we first look at the relationship between individual income and social interactions in trust. The measure of income is given by the following question in the WVS database: "*Here is a scale of incomes and we would like to know in what group your household is, counting all wages, salaries, pensions and other incomes that come in. Just give the letter of the group you fall into, after taxes and other deductions*". The answer is ordered in ten income categories corresponding to each decile.[13] In Table 9 - Columns (1) and (2), we present our regressions of income deciles on our indicators of individual trust and social interactions. We also control for individual characteristics including age, a quadratic for age, the number of years of education, marital status and religious affiliation. And we include time-varying national specific features. We run ordered probit estimates since our dependent variable, the income decile, is categorical.

Table 9 - Column (1) first suggests that the fact of trusting others is associated with a significant rise in the income ladder. The effect is statistically significant at the one percent level. But Table 9 - Column (2) indicates that this correlation pattern is driven by social interactions. When the interaction term between individual trust and national average trust

[13] Unfortunatly, the WVS database reports the income by categories instead of the levels of wages and incomes.

is controlled for, the coefficient on individual trust is still positively correlated with individual income but the effect is no longer statistically significant. By contrast, the interaction term is statistically significant at the one percent level and the size of the coefficient is nearly three times higher than the one associated with individual trust in Column (1).

Table 9: Social interactions in mutual trust and individual income: Ordered Probit estimates.

	Income deciles	
	(1)	(2)
Individual	.131***	.0003
trust	(.015)	(.057)
Individual trust ×		.350***
National Trust		(.012)
Adj-R^2	.056	.059
Observations	74893	74893

Controls: gender, age, age squared, education,religion,marital status, time varying country effects. Robust standard errors in parentheses. Source WVS, 1980, 1990, 2000: ***: 1%,**: 5%,*: 10%

Consistently with the macro-estimates, we then disentangle the different channels through which social interactions could favor individual economic performance. The first natural channel for explaining individual income could go through the employment status of the respondent. We first investigate the link between trust and labor market participation. According to Banfield's (1958) analysis of amoral familism, we should expect that individuals who have a low level of trust and who are living in a low-trust environment would prefer to restrict their activities to the family and to home production. We measure labor participation by a dummy equal to 1 if the respondent reports employed, self-employed or unemployed. The dummy is equal to 0 otherwise. We also investigate the link between trust and the fact of being employed rather than unemployed. We measure this outcome by a dummy variable which is equal to 1 if the respondent reports employed full-time, and 0 if the respondent reports unemployed.

In Table 10 - Columns (1)-(4), we present the estimates for the employment status on individual trust and social interactions. We control for the same set of variables as before, including time-varying country effects and individual characteristics. Columns (1)-(2) report the probit estimates for labor market participation. Column (1) shows that the coefficient on individual trust is positive and statistically significant at the one percent level as long as we do not control for the social interaction term. But as reported in Column (2), the effect of trust depends heavily on interactions with high trusting individuals. When we include the interaction term, the coefficient on individual trust becomes negative and is no longer statistically significant.

By contrast, the social interaction term is positive and statistically significant at the one percent level. The magnitude of the coefficient is also high, since the social interaction term is more than four times as high as the one associated with individual trust in Column (1). Table 10 - Columns (3) and (4) report the probit estimates on the probability of being employed rather than unemployed. The same positive correlation pattern holds between the fact of being employed and the extent of social interactions. When included, the interaction term drives the whole correlation and the marginal effect is economically very sizeable.

The second channel for explaining individual income could transit through the propensity to save. To get a measure of capital accumulation at the individual level, we use the following question from the WVS database: *"During the past year, did your family : i) save money, ii) just get by, iii) spent some savings and borrowed money, iv) spent savings and borrowed money"*. We recode the answers such that a higher score indicates a higher propensity to save. The answer to this question is likely to capture individual shocks on the labor market as well as higher preference for thriftiness. We thus control whether the individual is employed, self-employed, unemployed or inactive, in addition to the other previous individual controls.

Table 11 - Columns (1)-(2) report the ordered probit estimate of the propensity to save. Column (1) shows that the coefficient associated with individual trust is positively correlated with higher saving behaviors. But column (2) indicates that this correlation mainly goes through social interactions. The interaction term is the only coefficient which is statistically significant and is nearly three times as high as the coefficient associated with individual trust in Column (1).

The last channel consistent with the macro estimate is the relation between trust and the Solow residual. For that purpose, we look at attitudes which are favorable to competition and innovation. We consider a question representative of this kind of attitudes phrased as follows: "*Competition is good. It stimulates people to work hard and develop new ideas. Or competition is harmful, it brings out the worst in people"*. The answer is scaled between 1 and 10, a higher score indicating that the respondent considers that competition is harmful instead of stimulating people and developing new ideas. We recode the answers the other way around such that a higher score increases the probability that the respondent is favorable to competition and innovation.

Table 11 - Columns (3) and (4) report the link between individual trust, social interactions and the probability that the respondent considers competition as a way of encouraging innovation. The interaction term is the only one to be significant at the one percent level and its coefficient is almost an order of magnitude higher than the one associated with individual trust. These micro-estimates add credit to the strong impact of trust on economic development found

at the aggregate level, suggesting that this key impact is linked to strong social interaction effects.

Table 10: Channels for social interaction effects on individual income: Employment status. Probit estimates

	Labor market participation		Employed	
	(1)	(2)	(3)	(4)
Individual	.097***	-.061	.179***	.008
trust	(.023)	(.060)	(.021)	(.067)
Individual trust ×		.433***		.466***
National Trust		(.187)		(.175)
Adj-R^2	.418	.419	.155	.1562
Observations	69709	69709	41991	41991

Controls: gender, age, age squared, education, marital status, religion, time-varying country effects.
Standard errors are clustered at the country level.
Source WVS, 1980, 1990 and 2000: ***: 1%,**: 5%,*: 10%

Table 11: Channels for social interaction effects on individual income: Savings and Innovation. Ordered probit estimates

	Savings		Innovations	
	Family saved money last year		Competition is good: it brings new ideas	
	(1)	(2)	(3)	(4)
Individual	.058***	-.015	.051***	-.095
trust	(.022)	(.057)	(.020)	(.053)
Individual trust ×		.188**		.394***
National Trust		(.082)		(.132)
Adj-R^2	.035	.038	.048	048
Observations	27206	27206	30112	30112

Controls: gender, age, age squared, education, marital status, religion, time-varying country effects. Employment status included in (5) and (6).
Standard errors are clustered at the country level.
Source WVS, 1980, 1990 and 2000: ***: 1%,**: 5%,*: 10%

5 Conclusion

This paper has provided a new empirical strategy to uncover the causal effect of social attitudes on economic development. By using the level of trust that second-generation Americans inherited from their country of origin as an instrument for trust in the corresponding home countries, we have been able to identify an exogenous variation in trust across countries and over time. The

time-varying dimension of social attitudes enabled us to isolate the specific contribution of trust to economic development relative to other traditional candidates - institutions and geography - captured by the country fixed effects. By using this methodology on a panel of 30 countries over the period 1949-2003, we found that trust has a significant causal impact on macroeconomic outcomes. Most of the effects go through total factor productivity and the accumulation of physical and human capital. We also provided evidence that the magnitude of the effect of trust on economic development is linked to strong social interactions effects.

A remaining question is the underlying reasons for changes in social attitudes. This paper has used exogenous changes in inherited trust linked to the cohorts to which individuals belonged. We have shown that trust inherited by second-generation Americans from their country of origin differs significantly depending on their cohorts, and thus on the time of immigration of their parents in the United States. One main reason for such changes in trust is likely to be national crisis such as the two World Wars which have affected the different countries and the different generations differently. But this research agenda might also be promising for studying the effect of changes in institutions on the evolution of cooperative attitudes. This is a prerequisite for identifying institutions and public policies which are conducive to cooperative attitudes and could thus favor economic development.

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A Description of the estimation procedure

The aim of this appendix is to provide a detailed description of our estimation procedure.

We estimate the equation (variables are defined in the main text)

$$Y_{ct} = \alpha_0 + \alpha_1 S_{ct} + \alpha_2 X_{ct} + F_c + F_t + \varepsilon_{ct} \tag{A1}$$

where, S_{ct} is the average of social attitudes of people of working age in country c in period t conditional on their individual characteristics.

More precisely, S_{ct} is obtained by estimating the following equation

$$s_{ict} = \beta_{0t} + \beta_{ct}\mathbb{I}_{ict} + \beta_{2t}x_{it} + \varepsilon_{ict}, \tag{A2}$$

where s_{ict} denotes the social attitude of individual i who lives in country c in period t, x_{it} stands for a set of individual characteristics including the number of years of education, income, age, employment status and religious affiliation. $\mathbb{I}_{ict}$ is an indicator variable, equal to one if the individual i belongs to country c and to zero otherwise. ε_{ict} is an error term. The estimation of this equation allows us to obtain the differences between the average social attitudes of people in country c in period t conditional on their individual characteristics, and the average social attitudes of people in a reference country in period t conditional on their individual characteristics. The reference country is Sweden throughout the paper. Let us denote by ΔS_{ct} the difference between the conditional average of attitudes in country c in period t and the conditional average of attitudes in the reference country in the same period; one gets, by definition:

$$\Delta S_{ct} = \hat{\beta}_{ct},$$

where $\hat{\beta}_{ct}$ denotes the estimated value of the parameter β_{ct}. This definition of social attitudes, which are defined with respect to the attitudes of people who live in Sweden, leads us to estimate the equation (A1) written as

$$\Delta Y_{ct} = \alpha_1 \Delta S_{ct} + \alpha_2 \Delta X_{ct} + F_c + \Delta\varepsilon_{ct} \tag{A3}$$

where the operator Δ stands for the differences between the value of the variable and its value in Sweden.

In equation (A3), ΔS_{ct} is likely not independent of the residual $\Delta\varepsilon_{ct}$, which represents the specific shock on the indicator of economic performance (GDP, employment rate...) of country c in period t.

Therefore, we look for an instrument for the variable ΔS_{ct}. Assuming that social attitudes are transmitted across generations according to the model

$$S_{ct} = \gamma_0 + \gamma_1 S_{ct-1} + \gamma_2 X_{ct} + \Phi_c + \Phi_t + \nu_{ct}, \tag{A4}$$

or, when written in differences with respect to Sweden,

$$\Delta S_{ct} = \gamma_1 \Delta S_{ct-1} + \gamma_2 \Delta X_{ct} + \Phi_c + \Delta \nu_{ct}, \tag{A5}$$

a natural instrument for ΔS_{ct} is ΔS_{ct-1}, which measures the conditional average of social attitudes of the previous generation, *i.e.* of people who were of working age in the same country one generation before those who work in period t. To be able to uncover the social attitudes of the previous generation, we have to define periods which are separated by sufficiently large gaps. Namely, we consider two periods: 1949-1952 and 2000-2003. We consider that the working age population is made up of people aged from eighteen to sixty five years old. This leads us to define two generations: people who were born between 1935 and 1985 and were of working age between 2000-2003 , and people who were born during the period 1884-1934 and were of working age in 1949-1952.

The problem of equation (A4) is that we do not observe S_{ct-1} and then ΔS_{ct-1}. Therefore, we use the correlation between the social attitudes of people born in the US but whose parents, born in country c, immigrated to the US, and the social attitudes of people currently living in the country c.

We first measure the social attitudes of people currently living in the US and who originate from country c in the same way as we measure the social attitudes of people currently living in country c. We estimate the equation (A2) for people currently living in the US, where $\mathbb{I}_{ict}$ now stands for an indicator variable equal to one if the parents of individual i immigrated from country c. The estimation of this equation allows us to get the differences between the average social attitudes (conditional on individual characteristics x_{it}) of Americans whose parents immigrated from country c, and the conditional average social attitudes of Americans whose parents immigrated from Sweden. We denote by $\Delta \tilde{S}_{ct}$ these differences.

Then, we assume that immigrants transmit their social attitudes, inherited from their country of origin, to their children. In other words, we assume that $\tilde{S}_{ct}$, the conditional average of social attitudes of people of working age in period t, who live and were born in the US and whose parents immigrated from country c, is determined by the model

$$\tilde{S}_{ct} = \tilde{\gamma}_0 + \tilde{\gamma}_1 S_{ct-1} + \Phi_t + \tilde{\nu}_{ct}, \tag{A6}$$

which reads, when written in differences with respect to Sweden,

$$\Delta \tilde{S}_{ct} = \tilde{\gamma}_1 \Delta S_{ct-1} + \Delta \tilde{\nu}_{ct}. \tag{A7}$$

Assuming that $\tilde{\gamma}_1 \neq 0$, the elimination of ΔS_{ct-1} from equations (A5) and (A7) leads to a relation between ΔS_{ct} and $\Delta \tilde{S}_{ct}$ which can be written as

$$\Delta S_{ct} = \lambda_1 \Delta \tilde{S}_{ct} + \gamma_2 \Delta X_{ct} + \Phi_c + \Delta \mu_{ct}, \tag{A8}$$

where $\lambda_1 = \gamma_1/\tilde{\gamma}_1$, and $\Delta\mu_{ct} = \Delta\nu_{ct} - (\gamma_1/\tilde{\gamma}_1)\Delta\tilde{\nu}_{ct}$.

We then estimate the system of equations (A3) and (A8). $\Delta\tilde{S}_{ct}$ is an instrument for ΔS_{ct} if $\mathbb{E}(\Delta\tilde{S}_{ct} \cdot \Delta\varepsilon_{ct}) = 0$, i.e. if the social attitudes inherited by Americans of working age in period t from their country of origin are independent of the shocks on macroeconomic performance (Y_{ct}) in their country of origin in period t. This assumption is likely to be fulfilled to the extent that the correlation between $\Delta\tilde{S}_{ct}$ and ΔS_{ct} only comes from the past common attitudes of the people of the previous generations who were born in country c.

The system of equations (A3) and (A8) can be estimated directly for the period 2000-2003, since we observe S_{ct} and $\tilde{S}_{ct}$, the conditional average of social attitudes of people of working age (born between 1935 and 1985) in the US and in the countries of the sample for this period. However, we do not observe the social attitudes of people of working age in the period 1949-1952 since there are no data on social attitudes available in this period.

Let us denote by $t = 1$ the period 1949-1952 and $t = 2$, the period 2000-2003.

As long as there is a persistence of social attitudes within a given cohort, it is also possible to uncover social attitudes of people of working age in the period $t = 1$. Denoting by S^0_{c2} the conditional average (estimated with equation (A2)) of social attitudes of "old" people (who are no longer of working age in period 2, i.e. who were born before 1935 for the period 2000-2003) who live in country c in period $t = 2$, we assume that

$$S^0_{c2} = \pi_0 + S_{c1} + \xi_{c2},$$

where ξ_{c2} is an error term.

Similarly, for people who were born in the US, we assume that

$$\tilde{S}^0_{c2} = \tilde{\pi}_0 + \tilde{S}_{c1} + \tilde{\xi}_{c2}.$$

Using the values of S_{c1} and $\tilde{S}_{c1}$ defined in these two last equations and equations (A3) and (A8) we can write the set of equations that we estimate for periods $t = 1, 2$:

$$\Delta Y_{c2} = \alpha_1 \Delta S_{c2} + \alpha_2 \Delta X_{c2} + F_c + \Delta\varepsilon_{c2} \tag{A9}$$

$$\Delta S_{c2} = \lambda_1 \Delta\tilde{S}_{c2} + \gamma_2 \Delta X_{c2} + \Phi_c + \Delta\mu_{c2} \tag{A10}$$

$$\Delta Y_{c1} = \alpha_1 \Delta S^0_{c2} + \alpha_2 \Delta X_{c1} + F_c + \Delta\varepsilon_{c1} - \alpha_1 \Delta\xi_{c2} \tag{A11}$$

$$\Delta S^0_{c2} = \lambda_1 \Delta\tilde{S}^0_{c2} + \gamma_2 \Delta X_{c1} + \Phi_c + \Delta\mu_{c1} + \Delta\xi_{c2} - \lambda_1 \Delta\tilde{\xi}_{c2}. \tag{A12}$$

In period $t = 1$, $\Delta\tilde{S}^0_{c2}$ is a relevant instrument for ΔS^0_{c2} if $\mathbb{E}(\Delta\tilde{S}^0_{c2} \cdot (\Delta\varepsilon_{c1} - \alpha_1\Delta\xi_{c2})) = 0$. This assumption is likely to be fulfilled to the extent that $\tilde{S}^0_{c2}$, the conditional average of social attitudes of

"old" people who live in the US in 2000-2003 and were born in the US before 1935, is not correlated with ε_{c1}, the shocks on GDP in their country of origin, and with ξ_{c2}, the shocks on social attitudes of "old" people in their country of origin in 2000-2003. As the system of equations makes clear, the residuals of the different equations can be correlated. We thus estimate the coefficient of interest α_1 by a three stage least square procedure in order to get a variance of the estimators robust to the presence of heteroskedasticity.

B Data Appendix

Table 12: Summary statistics for second generation Americans: GSS database 1977-2002

country of origin	Obs	Trust	Men	Age	Education	Emp.	Unemp.	Inactive
Africa	107	.192	.514	38.68	12.75	.679	.066	.255
Austria	83	.531	.506	62.18	11.54	.315	.026	.657
Arabic	36	.452	.638	34.33	13.12	.457	.028	.514
Canada	140	.487	.584	55.06	11.72	.450	.05	.50
China	115	.437	.504	37.08	14.23	.707	.056	.235
Czech Republic	94	.508	.425	65.14	11.11	.228	.028	.742
Denmark	32	.785	.343	62.75	12.76	.391	.043	.565
Finland	50	.571	.360	63.34	10.63	.348	.023	.627
France	44	.521	.363	48.02	12.21	.555	.027	.416
Germany	331	.412	.407	59.76	12.09	.396	.012	.596
Greece	61	.333	.540	48.42	14.32	.615	.019	.365
Hungary	71	.454	.450	57.32	11.88	.430	0	.569
India	83	.400	.662	37.33	14.06	.817	.024	.158
Ireland	141	.551	.468	59.83	13.56	.437	.010	.552
Italy	471	.404	.447	59.15	11.88	.357	.031	.610
Mexico	360	.251	.461	37.31	11.68	.708	.061	.230
Netherlands	61	.538	.393	58.98	11.69	.440	.02	.54
Norway	68	.611	.426	67.63	12.30	.209	0	.790
Philippines	112	.266	.375	43.83	14.71	.772	.027	.20
Poland	273	.479	.483	60.56	11.74	.404	.01	.586
Portugal	31	.321	.419	47.70	11.43	.666	.041	.291
Puerto Rico	211	.183	.396	36.98	12.33	.554	.078	.366
Spain	98	.403	.459	41.70	13.7	.747	.034	.218
Spanish Latin America	196	.219	.403	37.30	13.56	.729	.052	.218
Sweden	66	.564	.378	65.71	12.51	.431	0	.568
United Kingdom	268	.522	.429	56.17	13.23	.452	.014	.533
Average	1808	.398	.438	51.38	12.34	.520	.032	.448
Std. Dev		.489	.496	19.12	3.64	.499	.177	.447

Table 13: Summary statistics by country of residency: WVS database

Country of residency	Obs	Trust	Men	Age
Algeria	1 014	.102	.508	32.77
Argentina	2 843	.184	.479	42.77
Austria	2 903	.327	.488	46.88
Canada	4 264	.457	.468	43.01
China	3 287	.550	.551	38.92
Colombia	2 914	.103	.500	35.40
Czech Republic	2 718	.268	.481	46.15
Denmark	2 634	.577	.510	43.42
Finland	2 426	.558	.492	41.95
France	3 275	.223	.488	43.17
Germany	5 870	.375	.456	45.54
Greece	1 050	.238	.424	35.94
Hungary	909	.224	.487	47.79
India	3 944	.367	.557	35.82
Ireland	2 350	.420	.463	45.34
Italy	4 359	.320	.491	43.06
Mexico	5 397	.250	.523	34.10
Morocco	994	.208	.493	29.18
Netherlands	2 433	.532	.460	34.10
Nigeria	3 511	.212	.547	30.69
Norway	4 337	.657	.520	42.74
Philippines	1 181	.086	.501	38.55
Poland	3 105	.230	.464	46.60
Portugal	2 023	.175	.446	44.00
Puerto Rico	1 630	.117	.354	44.60
Spain	8 386	.350	.489	43.43
Sweden	3 533	.639	.527	44.19
United Kingdom	2 640	.384	.474	45.09
Zimbabwe	851	.112	.517	32.78
Average	90704	.298	.485	41.46
Std. Dev		.457	.499	16.44

Table 14: Aggregate Summary statistics on macroeconomic performance: Periods 1949-52 and 2000-2003

Country	Income per capita	Capital stock per capita	Education (years)	Employment rate (over total population)
Africa	972.9031	3 085.658	5.337	.433
Austria	12 434.67	3 7350.270	8.703	.451
Arabic	2 126.112	4 555.007	1.967	.338
Canada	15 222.44	38 504.780	11.546	.425
China	2 199.453	7 372.988*	3.638	.444
Czech Republic	6 402.364	48 382.030*	8.807	.471
Denmark	15 043.470	42 802.59 0	9.318	.477
Finland	12 244.260	38 430.38 0	8.540	.465
France	13 599.530	38 745.150	9.572	.430
Germany	11 757.130	34 690.770	10.130	.434
Greece	7 483.725	18 964.08 0	7.857	.351
Hungary	5 118.611	24 145.320*	6.964	.422
India	1 318.472	2351.747	2.974	.365
Ireland	13 461.480	25 023.700	7.945	.424
Italy	11 453.910	34 209.290	7.316	.383
Mexico	4 805.527	9 640.011	4.685	.319
Netherlands	13 894.050	37 760.830	9.307	.429
Norway	15 700.930	46 400.650	10.043	.463
Philippines	1 812.672	3 916.997	4.852	.381
Poland	4 956.501	16 804.530*	7.645	.437
Portugal	8 047.235	24 600.430	4.695	.454
Puerto Rico	8 300.491	.		.343
Spain	9 375.395	25 450.530	6.248	.398
Spanish Latin America	3 662.944	4 281.194	4.782	.326
Sweden	14 018.810	35 811.920	9.322	.483
United Kingdom	13 921.630	32 444.090	10.855	.455

*Data only for the period 2000-2003