Social Attitudes and Economic Development: An Epidemiological Approach[1]

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Abstract

In this paper we develop a new empirical approach to uncover the causal link from social attitudes to economic development. We first show that social attitudes of second-generation Americans are 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 a causal effect of *inherited* social attitudes. This leads us to use the social attitudes of second-generation Americans as an instrument for the social attitudes in the home country of their parents to identify the causal effect of inherited social attitudes on economic development. This strategy allows us to isolate the specific contribution of social attitudes relatively to other traditional candidates, such as institutions and geography, by controlling for country fixed effects. We find that inherited social attitudes have explained a substantial share of economic development on a a sample of 30 countries since the post-war, by improving total factor productivity and the accumulation of human and physical capital.

KEYWORDS: Social attitudes, trust, economic development.

JEL CODES: O10, F10, P10, N13.

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 trustworthiness as one of the main determinant 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 perquisite for the successful development of market economies would be to depart from closed groups interactions and to enlarge exchanges to anonymous others. To that regard, trustworthiness appears 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 been recently restated by economists by using cross-country correlation 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).[2]

These contributions have tried to uncover a causal link from social attitudes toward economic development.[3] However we still lack reliable estimates which isolate the causal effect of social attitudes on economic development independently of other candidates already documented in the growth literature such as time-invariant institutions (Hall and Jones, 1999, Acemoglu et al., 2001, Rodrick, 1999) or geography (Sachs, 2003). The main concern faced by the studies trying to uncover a causal impact of social attitudes is that their are based on cross-sectional comparisons without any time-variation.[4] This makes it impossible to control for specific invariant national features which could codertermine both social attitudes and economic development, and thus drive the causal relationship. For instance, La Porta et al. (1997) consider that hierarchical religions may discourage the formation of trust. Assuming that the hierarchical structure of religions influences trust but not economic performance directly, cross-country correlations between the percentage of the population belonging to hierarchical religions, trust and economic

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

performance may be interpreted as a causal relation going from trust to economic performance using instrumental variable techniques. Obviously, this interpretation is right only if economic performance is not directly influenced by the percentage of the population belonging to hierarchical religions and if economic performance, trust and religions are not determined by common factors.

An important limit of the previous approach is that it can always been suspected that there are non observable time invariant variables, embedded in the history of each country, that cause both economic performance and trust.[5] This limit clearly shows up even in the most achieved contributions which rely on such an approach. 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 XXth century. Using instrumental variable techniques, the correlation between the historical variables observed at the end of the XIXth century and economic performance at the end of the XXth 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 have no direct impact on economic performance at the end of the XXth century. Second, all these variables are not 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 performance may come from unobserved region specific factors which determine trust and performance. This limit is inherent to the empirical strategy: since trust is assumed to be determined by historical variables which pre-existed several centuries ago, it is not possible to account for variations in trust and then to exploit the information obtained from the potential correlations between trust and economic performance across time. Accordingly this approach makes it impossible to include region fixed effects and cannot control for unobserved region time invariant specific factors. It is thus still impossible to state that social attitudes do matter *per se* or if they pick up the more fundamental influence of specific time invariant national features such as the quality of institutions and the legal origins (Djankov et al. (2002), Hall and Jones (1999)), the extent of fractionalization (Rodrick, 1999, Alesina et al., 2001) or geography (Sachs, 2003).

A convincing empirical strategy would thus require to exploit the information contained in changes in trust across countries *and* over time. It would make it possible to insure that correlations between trust and economic performance are not determined by unobservable time

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

invariant country specific factors[6] by including country fixed effects. It would also enable us to analyze relations between changes in trust and changes in economic performance across time, rather than relying on cross-country variations in indirect proxies for trust such as religious denominations or past institutions. The temporal dimension of the problem is important since trust has been found to change a lot over the last decades. Its sharp decline in some countries has motivated, in large part, reflexions of sociologists on social attitudes.[7] Surprisingly, this motivation has so far been absent from empirical studies devoted to the relation between trust and economic performance.

In this paper, we provide a new method which accounts for exogenous changes in trust across countries and over time. Our empirical strategy, presented in section 2, is based on the identification 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 focus on second-generation Americans and evaluate the specific role of trust in their home countries in shaping their own level of trust while controlling for other socioeconomic characteristics.[8] Our identification strategy relies on the strong correlation between trust of second-generation Americans and trust of people currently living in their country of origin. In the spirit of the epidemiology literature,[9] we interpret this phenomenon as the consequence of a causal effect of inherited trust on current trust. Then, we investigate the correlations between trust of second-generation Americans, trust of people in the countries of origin and economic performance to highlight a causal impact of inherited trust on economic performance.

In section 3, we start by implementing this empirical strategy to study the impact of inherited

[6] Contrary to Tabellini (2005) our analysis is at the country level rather than at the region level.

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

[8] See the surveys of Fernandez and Fogli (2005) and Guiso et al. (2006) on the role 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 origins 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.

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

trust at the microeconomic level. We use the *General Social Survey* and the *World Value Survey* to show that trust of second-generation Americans is strongly correlated with trust of people living in their country of origin. Using trust in the home countries as an instrument for trust of second-generation Americans, we show a sizeable effect of social attitudes on the income of second-generation Americans. This influence is still statistically highly significant when controlling for the characteristics of the parents, such as their education and income, and for country of origins fixed effects, which could codetermine both inherited trust and individual income.

These results provide support to investigate the impact of inherited trust on macroeconomic performance. In section 4, we analyze the effect of inherited trust on income per capita for 30 countries over the period 1949-2003. The set of countries covers all the regions over the world with European countries, North American countries, Asian countries and the African and Latin American continents. In order to include country-fixed effects we estimate potential changes in inherited trust of two separate cohorts of individuals: 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 trust has changed over time: the influence of the country of origin on 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 trust inherited from the country of origin of people born in the United States are in line with changes in trust in the corresponding home countries. These findings allow us to run regressions with country-fixed effects in a consistent way. By using trust of second-generation Americans as an instrument for trust in the home countries and controlling for country-fixed effects, we find that developing countries such as African countries 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 than that of the Swedish people. The impact is also economically sizeable among developed countries. 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 similar to that of the Swedish people. More strikingly, social attitudes turn out to be the main factor of explanation of income differences among some developped countries. For instance, by controlling for country-fixed effects and initial income, the lack of social attitudes in France would explain two third of its income per capita gap with Sweden in 2000-2003. 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. Section 5 concludes.

2 Estimation strategy and data

2.1 Estimation strategy

What is the causal effect of social attitudes on economic performance? We address this question by looking at the issues raised by the estimation of the following linear equation

$$y_{ict} = a_0 + a_1 s_{ict} + a_2 x_{it} + f_c + f_t + e_{ict} \tag{1}$$

where y_{ict} stands for an indicator of economic performance such as the income or the employment status of individual i in country c at date t. The variable s_{ict} measures social attitudes. x_{it} denotes a vector of characteristics such as gender, age, level of education and level of education of parents. f_c stands for country fixed effects, f_t stands for period fixed effects. e_{ict} is an error term.

The issue raised by equation (1) is that social attitudes are likely to be correlated with the error term e_{ict}. For instance, individuals who live in a more secure environment are likely to trust more others 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 to posit the following model

$$s_{ict} = \alpha_0 + \alpha_1 S_{c,t-T_i} + \alpha_2 x_{it} + \phi_c + \phi_t + \varepsilon_{ict} \tag{2}$$

where $S_{c,t-T_i}$, stands for the average of social attitudes of people living in the country c of individual i one generation before him (i.e. T_i years before date t, where T_i denotes the age of individual i). ϕ_c stands for country fixed effects, ϕ_t stands for period fixed effects. ε_{ict} is an error term.

In equation (2), it is assumed that social attitudes are determined by all factors accounted for to explain their economic performance and by social attitudes of the previous generation in the country c in which they live. The restriction that social attitudes of the past generation are excluded from the economic performance equation (1) allows us to identify, together with the assumption that $e_{ict} \perp S_{c,t-T_i}$, the parameters of the system of equations (1) and (2). This restriction is likely to be consistent to the extent that individual characteristics and country dummies are included in the right-hand side of the economic performance equation (1). Obviously, this restriction can be tested by appropriate statistical tests. However, as stressed by Tabellini (2005), the problem of this specification is that we do not have any information about $S_{c,t-T_i}$,

since standardized cross-country databases on social attitudes of the previous generations are not available.

To cope with the lack of information on social attitudes of previous generation, we assume that second-generation Americans inherit social attitudes from their country of origin c according to a model similar to the model used in the home countries:

$$\tilde{s}_{jct} = \tilde{\alpha}_0 + \tilde{\alpha}_1 S_{c,t-T_j} + \tilde{\alpha}_2 \tilde{x}_{jt} + \tilde{\phi}_c + \tilde{\phi}_t + \tilde{\varepsilon}_{jct} \tag{3}$$

where the variables with a tilda concern the second-generation Americans who currently live in the US. Then, it is possible to substitute for $S_{c,t-T}$ from equations (2) and (3) to get

$$s_{ict} = \bar{\alpha}_0 + \bar{\alpha}_1 \mathbb{E}\left(\tilde{s}_{jct} | c, T_i\right) + \alpha_2 x_{it} + \bar{\phi}_c + \bar{\phi}_t + \varepsilon_{ict} \tag{4}$$

where $\mathbb{E}\left(\tilde{s}_{jct} | c, T_i\right)$ denotes the average of social attitudes of second-generation Americans of age T_i at date t who originate from country c.[10]

We estimate the system of equations (1) and (4), in which the conditional average of social attitudes of second-generation Americans at time t is used as an instrument for the social attitudes of individuals currently living in the home country of their ancestors. 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 might be due to the fact that people whose forebears originate from the same country share common past social attitudes that they transmitted to their children independently of the economic environment. 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 reflect the causal impact of such common past social attitudes on current social attitudes. Now, the assumption that $e_{ict} \perp S_{c,t-T_i}$, boils down to assume that $e_{ict} \perp \mathbb{E}\left(\tilde{s}_{jct} | c, T_i\right)$. This assumption will be tested with appropriate statistical technics.

It is worth noting that our strategy allows us to find several potential instruments for social attitudes. This issue is important to the extent that several instruments are needed to test the exogeneity of instruments with overidentification tests. It is possible to instrument the social attitudes of people currently living in the country of origin of second-generation Americans by the current attitudes of second-generation Americans of different ages. More precisely, instead of

[10] We also have

$$\bar{\alpha}_0 = \alpha_0 - \left(\alpha_1 \tilde{\alpha}_2 / \tilde{\alpha}_1\right) \mathbb{E}\left(\tilde{x}_{jct} | c, T_i\right) - \left(\alpha_1 \tilde{\alpha}_0 / \tilde{\alpha}_1\right)$$
$$\bar{\alpha}_1 = \alpha_1 / \tilde{\alpha}_1, \bar{\phi}_c = \tilde{\phi}_c \bar{\alpha}_1 + \phi_c, \bar{\phi}_t = \tilde{\phi}_t \bar{\alpha}_1 + \phi_t.$$

using social attitudes of second-generation Americans who have the same age as that of people living in the home countries, we can use as an alternative instrument the social attitudes of second-generation Americans who have the age of the parents of people currently living in the country of origin. This instrument might be relevant if parents transmit their attitudes to their children and if attitudes remain stable over the life-cycle, as suggested by empirical studies on the evolution of social attitudes (Putnam, 2000, Robinson and Jackson, 2001). Accordingly, the social attitudes of second-generation Americans of the age the parents of people currently living in the country of origin is a also a potential instrument. Formally, this instrument can be justified by adding a model of evolution of attitudes over the life-cycle described by an equation similar to equation (2) where the attitudes of individuals of the age of the parents of people currently living in the country of origin, denoted by s^o_{ict}, would be substituted to s_{ict}, the attitudes of the individuals currently living in the country of origin.

We also stress the fact that our estimation strategy can be used in two ways. It is possible to instrument the social attitudes of people currently living in the country of origin of second-generation Americans by the current attitudes of these Americans. But it is also possible to estimate the impact of social attitudes of second-generation Americans on their economic performance by instrumenting their social attitudes by those of people currently living in the country of origin of their parents. In this case, we estimate the following system of equations (5) and (6)[11]

$$\tilde{y}_{ict} = \tilde{a}_0 + \tilde{a}_1 \tilde{s}_{ict} + \tilde{a}_2 \tilde{x}_{it} + \tilde{f}_c + \tilde{f}_t + \tilde{e}_{ict} \tag{5}$$

$$\tilde{s}_{ict} = \breve{\alpha}_0 + \breve{\alpha}_1 \mathbb{E}\left(s_{ict} | c, T\right) + \tilde{\alpha}_2 \tilde{x}_{it} + \breve{\phi}_c + \breve{\phi}_t + \tilde{\varepsilon}_{ict} \tag{6}$$

In what follows we apply our estimation strategy to evaluate the causal impact of trust on individual economic performance and then on macroeconomic performance.

2.2 Data description

In this section, we discuss the data used to measure social attitudes of second-generation Americans by country of origin of their parents and social attitudes in the corresponding home countries. The sample consists of 30 countries: Algeria, Argentina, Austria, Belgium, Canada, China,

[11] We have in this case

$$\breve{\alpha}_0 = \tilde{\alpha}_0 - \left(\tilde{\alpha}_1 \alpha_2 / \alpha_1\right) \mathbb{E}\left(x_{jt} | c, T_i\right) - \left(\tilde{\alpha}_1 \alpha_0 / \alpha_1\right)$$
$$\breve{\alpha}_1 = \tilde{\alpha}_1 / \alpha_1, \breve{\phi}_c = \phi_c \breve{\alpha}_1 + \tilde{\phi}_c, \breve{\phi}_t = \phi_t \breve{\alpha}_1 + \tilde{\phi}_t$$

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.

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 from?*" 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 origins are available for: China, India and Philippines. Eventually, 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 allows us 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 to track 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. In particular, we reconstruct the categories African origins and Latin American origins 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 wave 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.

Eventually, 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 equals 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 50 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 percent point 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 origins, the standard deviation reaching 46.5 percent.

3 Trust and individual economic performance

We start by investigating the causal impact of trust on economic performance at the individual level. For that purpose, we proceed in three steps. First we show that individual trust of second-generation Americans are higly influenced by the country of origin of their ancestors. Second we show that individual trust of second-generation Americans are significantly correlated with the level of trust of their counterparts of the same age in the home countries. This correlation remains statistically significant even after controlling for country of origin specific effect capturing for instance past economic and institutional development. Third, we draw on this result to instrument the level of trust of second generation Americans by the corresponding level of trust in the home countries to uncover the causal effect of trust on their individual economic performance.

The main part of our analysis at the individual level is focused on the individual economic performance of second-generation Americans. The reason is that there are not enough observations in the GSS database to compute the average level of trust by age which is needed to instrument the individual trust in equation (4). Accordingly, we use the WVS database to compute the average level of trust of people living in the home country of second-generation Americans as indicated in equation (6). Moreover, the GSS database provides additional controls on the characteristics of the parents which are useful to deep further the causal effect of trust on individual economic performance.

3.1 Inherited social attitudes in the US

We start by documenting the significant effect of the country of origin of second-generation Americans on their level of trust. This effect of inherited attitudes is at the core of our strategy displayed in equations (2) and (3), which enables us to back out a correlation between current trust in the home countries and current trust of second-generation Americans by country of origin.

To measure how second-generation Americans varied in their social attitudes depending on their country-of-ancestry, we ran 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 respondent's parents. 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.

The analysis is focused on second-generation Americans who belong to the working age population (between 18 and 65 years old). The analysis draws on the period 1977-1992, since the question on the location of birth is documented only since 1977.

Table 1 reports the marginal effects of the country-of-ancestry dummies for second-generation Americans. Marginal effects are computed with the remaining variables evaluated at their means. 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 to have forebears coming from a different country of origin than Sweden has always a statistically significant effect at the 1 percent level on social attitudes. The gap is the most sizeable for Americans with African origins and Latin American origins, the probability to trust others being reduced by 30 percent and 28 percent by comparison with Americans with Swedish forebears. Respondents with Mediterranean origins and Eastern European origins come next. For instance, the fact to have Italian origins reduces by 14 percent the level of trust comparatively 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. The fact to have forebears from UK also leads to a lower level of trust but the gap with Sweden reaches only 3.4 percent. Eventually, people whose forebears came from other Nordic countries tend to have comparable or slightly higher level of trust.

Table 1-Col.2 reports the marginal estimates of inherited attitudes when the full set of other individual controls are 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, the age, and the fact to be employed rather than unemployed. But except 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 to capture and instrument social attitudes by religious affiliation in aggregate panel data.

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

	Trust in other=1			
	Second-generation Americans			
Country of origin	(1) : No controls		(2): Controls	
	Coeff	Std Error	Coeff	Std Error
Africa	-.309***	(.010)	-.269***	(.014)
Arab	-105***	(.023)	-.036	(.026)
Austria	-.030***	(.002)	-.035***	(.009)
Canada	-.085**	(.009)	-.043***	(.013)
China	-.112***	(.020)	-.107***	(.021)
Check Rep.	-.050***	(.001)	.031**	(.012)
Denmark	.369***	(.001)	.397***	(.006)
Finland	.092*	(.011)	.089***	(.015)
France	-.035**	(.015)	-.087***	(.015)
Germany	-.132***	(.006)	-.076***	(.015)
Greece	-.199***	(.012)	-.195***	(.011)
Hungary	-.018***	(.006)	-.015***	(.007)
India	-.154***	(.018)	-.162***	(.021)
Ireland	-.010**	(.004)	.064***	(.006)
Italy	-.145***	(.006)	-.082***	(.007)
Latin Am	-.287***	(.014)	-.252***	(.015)
Mexico	-.273***	(.014)	-.172***	(.016)
Netherlands	.081***	(.009)	.080***	(.009)
Norway	.037***	(.003)	.147***	(.006)
Poland	-.079***	(.004)	-.045***	(.006)
Philippines	-.248***	(.012)	-.218***	(.014)
Portugal	-.221***	(.010)	-.114***	(.014)
Puerto Rico	-.310***	(.010)	-.242***	(.018)
Spain	-.148***	(.017)	-.109***	(.016)
Sweden				
U.K	-.034***	(.007)	-.022***	(.007)
Pseudo-R^2	.059		.087	
Observations	2189		1924	

Marginal effects. Robust standard error.with clustering at country level.
GSS 1977-2004. ***:1%, **: 5%, *: 10

Table 2: Marginal effect associated with individual characteristics

Trust in other=1	Individual controls	
Controls	Coeff	Std Error
Age	.007*	(.004)
Age2	-.000	(.000)
Men	.066***	(.024)
Education	.029***	(.005)
Education mother	.003	(.011)
Education father	-.000	(.001)
Unemployed	Reference	
Employed	.047	(.061)
Inactive	.022	(.069)
Protestant	Reference	
Catholic	.001	(.019)
Muslim	.042	(.275)
Jew	-.015	(.048)
Buddhist	.026	(.075)
No religion	-.004	(.010)

Marginal effects. Robust standard error.with clustering at country level. GSS 1977-2004
***:1%, **: 5%, *: 10

3.2 Instrument for trust by country of origin

This section examines the correlations between inherited social attitudes of second-generation Americans and social attitudes of their counterparts in the home countries. As stressed in the previous section, we could use social attitudes of different generations in the home countries as different instruments for social attitudes of second-generation Americans. For the sake of simplicity, we first present the results where the level of trust of second generation Americans is instrumented with the level of trust in the home countries of individuals of the same age as that of second-generation Americans. We report the regressions with the other instrument and the overidentification tests in the robustness check section presented below.

Table 3 reports our basic results. In the first column, we control only for the level of trust in the home countries for individuals of the same age as the respondent. The second column includes country of origin fixed effects in addition to the variables of trust in the home countries. This strategy allows us to take into account any other country of origin invariant feature, such as past institutional environment, which could codetermine both the level of trust in the US and in the home countries. All specifications also control for the exogeneous demographic variables age and gender. Other individual characteristics, such as employment status and religious affiliation, are likely to be endogenous and are not statistically significant, as shown in the previous Table 2.

The next section will check the robustness of our results to the inclusion of additional exogenous controls such as education of the parents and income of the parents.

As Table 3 reports, trust in the home countries of people of a given age has a positive and statistically significant correlation with trust of second-generation Americans of the same age. The marginal effects in Column 1 imply that a 1 percentage point increase in the share of trustworthy people in the home countries is associated with a 0.37 percentage point increase in the probability that second-generation Americans from the corresponding country of origin think that other people can be trusted. It might be the case that the level of trust of second-generation Americans and that of households of the same age in the home countries are shaped by specific time invariant national features such as the institutional design of the country of origin. Yet, Table 3 - Column (2) shows that the correlation remains still statistically significant when controlling for country of origin fixed effects. However, the size of the coefficient on trust is significantly reduced by taking into account country of origin fixed effects, since the marginal effect drops from .37 percentage point to .15 percentage point.

Table 3: Individual determinants of trust: Probit estimate - First stage

Dependent variable	Trust of second-generation Americans	
	(1)	(3)
Trust in home countries	.902***	.413**
	(.191)	(.201)
Country of origin dummies	No	Yes***
Pseudo-R^2	.0315	.0710
Observations	1415	1415

Probit estimates. Additional controls: age and gender.
Robust standard error with clustering at country level.
GSS : ***:1%, **: 5%, *: 10

3.3 Individual economic pay-off of trust

This section investigates to what extent individual social attitudes are associated with higher individual economic performance. Namely we estimate on second-generation Americans the equation (5):

$$\tilde{y}_{ict} = \tilde{a}_0 + \tilde{a}_1 \tilde{s}_{ict} + \tilde{a}_2 \tilde{x}_{it} + \tilde{f}_c + \tilde{f}_t + \tilde{e}_{ict}.$$

As discussed previously, the main concern with such an equation is the direction of causality. Wealthier people might also tend to be more trustworthy. We thus use the previous estimates of equation (6) to instrument individual trust of second-generation Americans with that of

household living in the home countries. We measure individual economic performance by the respondent's level of income. The question on income reads as follows in the GSS database: "*In which of these groups did your earnings for last year fall? That is, before taxes or other deductions.*" The answer is ordered in twelve categories from 1 for under $1,000, 2 for $1,000 to $2,900, 3 for $ 3,000 to 3,999, 4 for $ 4,000 to 4,999, 5 for $ 5,000 to 5,999, 6 for $ 6,000 to 6,999, 7 for $ 7,000 to 7,999, 8 for 8,000 to 9,999, 9 for $10,000 to 14,999, 10 for $15,000 to 19,999, 11 for $20,000 to 24,999, and 12 for $25,000 or over. Respondent incomes are in constant dollars (base=1986).

Table 4 reports the second stage estimate of the impact of trust on individual economic outcomes. In the second stage, we plug in the predicted values of trust implied by the first stage regression reported in Table 3. Table 4 - Column (1) and (2) reports the ordered probit estimates of the impact of trust on individual income. The effect is statistically significant and economically sizeable. To get an order of magnitude of the effect, we also run least square estimates. In Column (1) without country of origin dummies, the fact to trust other increases by 2.17 percentage point the probability to belong to a higher income ladder. In Column (2), the specific causal effect of trust is even higher when country of origin fixed effects are included. The fact to trust others increases by 4.78 percent the probability to climb one ladder in the income scale.

Table 4: Trust and Individual economic performance: Ordered probit. Second stage

Dependent variable	Income categories	
	(1)	(2)
Individual trust	1.205**	3.862**
(IV: trust in home countries)	(.582)	(1.647)
Country of origin dummies	No	Yes***
Observations	1415	1415

Ordered Probit estimates. Additional controls: age, gender. education. Robust standard error with clustering at country level. GSS and WVS : ***:1%, **: 5%, *: 10

3.4 Robustness checks

This section provides tests of our findings on the causal effect of individual trust on individual income. The validity of our two stage estimations depends on the assumption that individual economic performances of second-generation Americans of a given age are not directly affected by social attitudes of people of the same age in their corresponding country of origin. We substantiate further the relevance of this assumption along two dimensions. First, we control for

additional variables which could plausibly be correlated with both trust in the home countries and individual economic performance and check wether the addition of these variables could change the estimates. Second, we investigate the validity of our approach by using overidentification tests.

3.4.1 Additional controls and instruments

The first concern with our identification strategy is that some variables could affect both the level of trust in the home countries and the economic performance of second generation Americans. The most plausible ones are the characteristics of the parents such as their human capital and their income. The GSS database allows us to partially control for these characteristics. First, the respondents are asked about the level of education of their parents with the question: "What is the highest degree of your father? of your mother? ". The answer ranges into five categories:"Less than high school", "High school", "Associate junior", "Bachelor", "Graduate". Second, we also have an indirect information of the economic backgrounds of the respondent with the following question: "Thinking about the time when you were 16 years old, compared with American families in general then, would you say your family income was–far below average, below average, average, above average, or far above average?". This question does not provide a direct objective measure of the level of income of the parents. Yet the subjective comparison with other families might be even more relevant to explain individual trust in others.

Table 5 reports the first stage estimate of individual trust with these additional controls (age and gender are always included). Table 5 - Column (1) reports the probit estimates without country of origins fixed effects while Column 2 includes them. The coefficient associated with trust in the home countries is slightly smaller than in the baseline estimate, but remains statistically significant. By contrast, all the additional controls are insignificant. Table 6 reports the second stage regression of the effect of trust on individual income. The additional controls have little effect on our second stage regression. Individual trust is still statistically significant effect at the one percent level in the specification with country of origins fixed effects.

We also test the robustness of our results when using alternative instruments. As discussed in the previous section, if trust persists within a cohort and is transmitted between cohorts, we can instrument the level of trust of second-generation Americans by the average level of trust of people of the age of their parents who live in their country of origin. By assuming that parents have their children when they are between 20 years old and 40 years old, we use as an instrument for social attitudes of second generation Americans the social attitudes of the cohort which is between 20 years and 40 years older in the home countries. Robustness checks have been performed with various ranges of years between cohorts. All the estimates control for age,

gender, education and the characteristics of the parents (family income when the respondent was 16 years old, father's highest educational degree and mother's highest educational degree). Since the new instrument for trust displays much less variation by country of origin when defined on a wider range of ages (twenty years in the baseline specification), we do not include country of origins fixed effects.

Table 5 - Column (3) reports the first stage estimate for the new instrument. The coefficient of correlation with trust of second-generation Americans is still statistically significant at the one percent level. The size of the coefficient is quite identical to the one associated with average trust in the home countries for people of the same age as second-generation Americans. Table 5 - Column 4 includes the two instruments in the same regression, showing that both instruments are statistically significant. Table 6 - Column 3 and 4 report the corresponding second stage estimate. The coefficients associated with the instrumented value of individual trust are statistically significant in both cases.

Table 5: Individual determinants of trust: First stage - Additional controls

Dependent variable	Trust of second-generation Americans			
	(1)	(2)	(3)	(4)
Average trust in home countries of people of the same age	1.207***	.448**		1.005**
	(.324)	(.206)		(.442)
Average trust in home countries of older cohorts			1.180***	.678*
			(.337)	(.342)
Father's education	.010	.014	.020	.019
	(.024)	(.013)	(.030)	(.030)
Mother's education	-.011	-.005	-.005	-.006
	(.018)	(.020)	(.039)	(.038)
Parents' income at 16 years old	-.041	-.015	-.021	-.030
	(.050)	(.038)	(.058)	(.062)
Country of origins	No	Yes***	No	No
Pseudo-R^2	.032	.076	.065	.071
Observations	896	896	580	580

Probit estimates. Additional controls: education, age, gender.
Robust standard error with clustering at country level. GSS and WVS : ***:1%, **: 5%, *: 10

3.4.2 Overidentification tests

As a final test, we investigate the exogeneity of our instruments by using overidentification tests. To be exogenous, our various instruments should be orthogonal to the error term in the income equation. The overidentification test relies on the assumption that one of the instrument, say the

Table 6: Trust and Individual income: Second stage - Additional controls

Dependent variable	Income categories				
	(1)	(2)	(3)	(4)	(5)
Individual trust	3.333***	2.823***	3.074***	2.980***	3.346***
	(.339)	(1.140)	(.555)	(.474)	(.436)
Average trust in home countries of older cohorts					-.477
					(.388)
Father's education	-.052	-.028**	-.059*	-.059*	-.054*
	(.007)	(.013)	(.034)	(.032)	(.032)
Mother's education	.009	.018	-.007	-.007	.001
	(.014)	(.012)	(.015)	(.014)	(.001)
Parents' income at 16 years old	.124***	-.018	.156***	.159***	.165***
	(.062)	(.042)	(.055)	(.059)	(.063)
Country of origins fixed effects	No	Yes***	No	No	No
Pseudo-R^2	.060	.101	.056	.057	.062
Overidentification test p-value (from chi-squared test)				[0.91]	
Observations	896	896	580	580	580

Ordered Probit estimates. Additional controls: education, age, gender.
Robust standard errors with clustering at country level. GSS and WVS: ***:1%, **: 5%, *: 10

average trust in the home countries of people of the same age as second-generation Americans, is truly exogenous. And we test for the exogeneity of the other instrument consisting of the average trust in the home countries of people of the age of the parents of second-generation Americans. We presume that this variable might be less exogenous than the first instrument since parents are likely to transmit characteristics which could directly affect both trust and economic outcome of their offsprings. We assume henceforth that trust in the home countries of people of the same age of second-generation Americans is our "truly" exogenous instrument.

The results of the overidentication tests are reported in Table 6 - Column 5 reports an easy-to-interpret version of the overidentifcation test. It directly includes the average trust of older cohorts of potential parents from the home countries in the second stage estimate. The first stage estimates have been obtained by using as an instrument the average trust in the home countries of people of the same age as second-generation Americans, and is similar to that reported in Table 5 - Column 1. If this variable had a direct impact on the individual income of second-generation Americans who are between 20 year and 40 years younger, we would expect this variable to be statistically significant. But Table 6 - Column (5) shows that the size of the coefficient is small and the coefficient is statistically insignificant. This suggests that social attitudes in the home countries likely work on individual income of second-generation Americans

only through their correlation with social attitudes of the second generation Americans.

We also perform more formal χ^2 overidentification tests. We test whether the second stage coefficient of trust on income, estimated with the instrument of trust in the home countries of people of the same age as second-generation Americans, is significantly different as the one estimated using average trust of older cohorts in the home countries in addition to our "genuinely" exogenous instrument. The corresponding first stage estimates are still reported in Table 5- Column (3) - (4). The second stage estimates are shown in 6.- Column (3) - (4). The coefficients of the second-stage estimates turn out to be of the same order of magnitude across the two specification. The bottom of Table 6 - Column (4) reports the p-value for the null hypothesis that the coefficients are equal across the two specifications. The probability to reject the null hypothesis is lower than the 10 percent level.

4 Trust and macroeconomic performance

This section investigates to what extent the strong effect of individual trust on economic performance at the individual level translates at the macro level on the economic development of different countries. For that purpose, we look at the previous instrumental strategy the other way around. We instrument the level of trust of people living in the home countries by the level of trust by country of origin of second-generation Americans to uncover a causal impact of social attitudes on cross-country economic development. A key issue in this analysis is to be able to control for time invariant national features of the different countries by providing time-variation in our instruments for social attitudes. The analysis draws on the period 1949-2003 for the same previous 30 countries.

4.1 Estimation strategy and data

4.1.1 Estimation strategy

In this section, we estimate the impact of inherited trust on macroeconomic performance in the same way as in the previous section focused on individual behaviors. Our point of departure is the estimation of the system of equations that looks like the equations considered at the individual level:

$$Y_{ct} = \alpha_0 + \alpha_1 S_{ct} + \alpha_2 X_{ct} + F_c + F_t + \varepsilon_{ct} \tag{7}$$

$$S_{ct} = \gamma_0 + \gamma_1 S_{ct-1} + \gamma_2 X_{ct} + \Phi_c + \Phi_t + \nu_{ct} \tag{8}$$

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 the 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 and Φ_c stand for country fixed effects capturing all other time invariant specific features such as the legal origins or past institutions with long-lasting effects; F_t and Φ_t stand for period fixed effects common to all countries; ε_{ct} and ν_{ct} denote error terms.

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 allows 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.

Like in the previous section, to cope with the lack of information on the social attitudes of the previous generation, we replace the variable S_{ct-1} by the average (conditional on individual characteristics) social attitudes that second-generation Americans inherited from country c. Namely, we estimate the system[12]

$$\Delta Y_{ct} = \alpha_1 \Delta S_{ct} + \alpha_2 \Delta X_{ct} + F_c + \Delta \varepsilon_{ct}, \tag{9}$$

$$\Delta S_{ct} = \delta_1 \Delta \tilde{S}_{ct} + \delta_2 \Delta X_{ct} + \Phi_c + \Delta \nu_{ct}, \tag{10}$$

where the operator Δ stands for the differences between the value of the variable and its value in Sweden. Social attitudes $\tilde{S}_{ct}$ are those of the cohorts born between 1884-1934 and 1935-1985 who belonged to the working-age population in 1949-1952 and 2000-2003 respectively. 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 (8), that is:

$$\tilde{S}_{ct} = \tilde{\gamma}_0 + \tilde{\gamma}_1 S_{ct-1} + \tilde{\Phi}_t + \tilde{\nu}_{ct}, \tag{11}$$

   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 (8) in the period 2000-2003, where we replace, on the right hand side, the conditional average of trust of

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

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 in 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 the equation (8) for the period 1949-1952. We would replace S_{c0}, the conditional average of trust of the generation who was in the working age in 1898-1901, which appears in the right hand side of equation (8) 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 trust of the working-age people in the period 1949-1952, we assume that there is a cohort effect 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 not any more 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

$$S^0_{c2} = \pi_0 + S_{c1} + \xi_{c2}, \tag{12}$$

where ξ_{c2} is an error term. Notice that trust of the previous generation S_{c1} could be instrumented by the trust of the current old generation S^0_{c2}. Yet, this is not 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 independent of the error term ε_{ct} that appears in the economic performance equation (7). It is shown in appendix A that this assumption allows us to estimate an equation similar to equation (8) 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.

4.1.2 Data

Our first indicator of macroeconomic performance is the income per capita expressed in 1990 US dollars. Data are borrowed from Maddison cover the period 1820-2003. The sample still 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. 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. Since the WVS 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.

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.[13] The database is completed by using data on the investment share over 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.

4.2 Instruments for trust in OECD home countries

The estimation strategy for cross-country comparison is similar to that run on individual data. To uncover a causal link from trust of macroeconomic development, we use the correlation between trust by country of origin of second-generation Americans and trust in the home countries. Yet the aggregate analysis differs in two points from the individual analysis. First, we look at the correlation the other way around. Since we are interested on the impact of trust on cross-country economic development, we instrument the level of trust in the home countries by that of the country of origin. Secondly, we focus on two specific cohorts in order to get time-variation

[13] 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.

in our cross-country comparison, allowing us to control for national invariant features. This section is devoted to the presentation of social attitudes for these two specific cohorts. Next, we show that social attitudes by country of origin of Americans belonging to these two cohorts are a relevant instrument for social attitudes of these cohorts but in the home countries.

Table 6 reports the marginal effects of country-of-origins dummies for second-generation Americans who were born between 1885-1934 and 1935-1985. Only controls for demographic variables are included at this first stage. For both cohorts, the country-of-ancestry dummies are highly significant and economically sizeable. Coefficients vary from -37 percent (Philippine's origins) to 39.8 percent (Danish origins) for second-generation American 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 United Kingdom was higher to that of people with Swedish origins as long 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 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 R^2=0.51. Figure 1 suggests that parents who migrated to the United States have transplanted their level of trust to their children in a fairly similar way as parents who stayed instead in the home country did. More rigorous analysis below confirms this phenomenon.

Table 7-Column (1) and (2) report GLS regressions of the cross-section correlation between the level of trust of second-generation Americans and that of people currently living in the home countries. 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 measured by the marginal effects of country of residency. The explanatory variable is the marginal effect on trust of country of origin. Table 7 - Column (1) first shows the correlation without any controls. Table 7 - Column (2) includes the initial average gap in the level of GDP per capita in the home

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

Table 7 - Column (3) and Column (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 relatively to Sweden. The explanatory variable is the level of trust of second-generation Americans measured by the marginal effect of countries of ancestry relatively to Swedish origins. Table 7 - Column (3) reports the within correlation without controlling for the gap in lagged GDP per capita while Table 7 - Column (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 noticing 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 on the top of 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, which capture many features such as legal origins, religions or geography, have a statistically significant and economically sizeable impact on current trust. This last point highlights the value-added of our approach

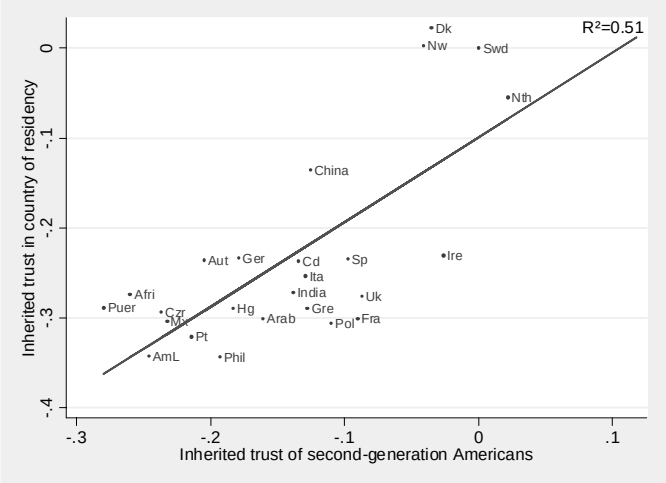

Figure 1: Trust of second-generation Americans by country of origins relative to trust of nationals in country of residency. *Note*: Marginal effect from probit estimates on WVS and GSS databases.

which uses a time-varying instrument for trust and thus allows to account for other fundamental determinants of social attitudes captured by fixed effects.

Table 7: Correlations between inherited attitudes and current national social attitudes

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

GLS Estimates. WVS 1980, 1990, 2000 and GSS 1977-2004.

4.3 The impact of trust on GDP per capita

Three stage Least Square (3SLS) estimates of the system of equations (9) and (10) are reported in Table 8. 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 8-Col. 1 reports the correlation between trust and the gap in GDP per capita relatively to Sweden without any 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 8: IV Regressions of GDP per capita. Periods 1949-52 and 2000-03

	(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 the causal effect of social attitudes on GDP, Figure 2 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.[14] 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 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) argued, traditional societies are characterized by pervasive intra-group trust

[14] 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 8-Col 3, Panels A and B.

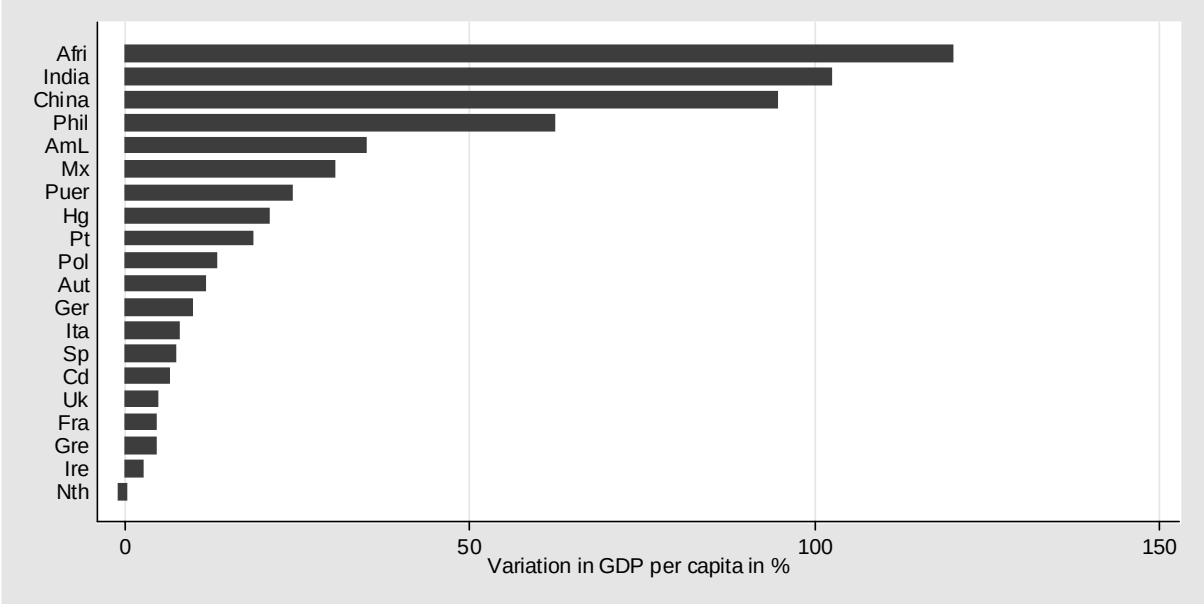

Figure 2: Predicted variations in GDP per capita in period 2000-2003 if the level of inherited trust of people in working age were the same as in Sweden, controlling for country fixed effects.

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 2 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 GPD by 5 percent if the level of inherited trust was the same as in Sweden.

Figure 3 illustrates the impact of inherited trust on GDP per capita from another perspective. This Figure displays the reduction in the GDP per capita gap relatively 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). It turns out that differences in inherited trust explain a very large share of differences in GDP per capita among developed countries. For instance France would reduce by more than two third its gap in GDP per capita relatively to Sweden if the French had the same level of inherited trust than the Swedes. By contrast, differences in inherited trust explain a smaller part of the differences in GDP per capita as long as developing countries are concerned. This result is fairly consistent since institutions in developed countries are much closer to Swedish institutions than are those of developing countries. In other words, countries whose GDP per capita is much lower than that of Sweden are not only hampered by their low level of inherited trust. They are also influenced by other structural elements which explain the largest share of their GDP differential with Sweden. Such

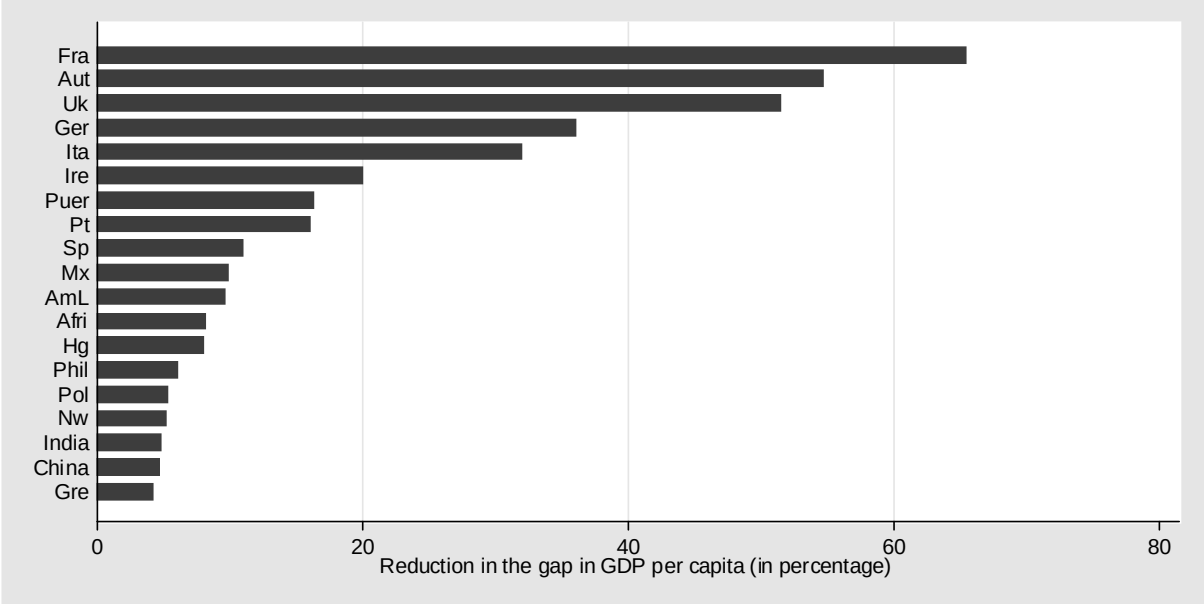

Figure 3: Reduction (in percentage) in the gap in GDP per capita with respect to Sweden if the level of inherited trust of people in working age were the same as in Sweden in the period 2000-2003.

other elements may be linked to specific national features such as institutions or geography.

From this viewpoint, our approach adds new insights on the impact of social attitudes on economic development since the 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). To 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 2 and 4 shows[15] 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 appears clearly that the inclusion of country fixed effect is of first importance. Accordingly, it is necessary to use time-varying instruments for trust in order to get relevant estimates and isolate the specific contribution of social attitudes relatively to other specific invariant national features.

Eventually, it is 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 mainly put on two candidates: institutions and geography. Institutions, in particular property

[15] In Figure 4 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 8-Col 2, Panels A and B.

rights and rule of law, have been found to limit rent-seeking or rent extractions 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. Social infrastructures were defined 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 channel. Yet they are only based on cross-country comparison and cannot control for country fixed effects since they use time invariant proxies 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 on 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 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 has a comparative advantage by allowing us to analyze both cross-country and temporal dimensions. 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 relatively not only to institutions and geography but also to any other potential invariant national factors.

4.4 Decomposition of the impact of trust

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

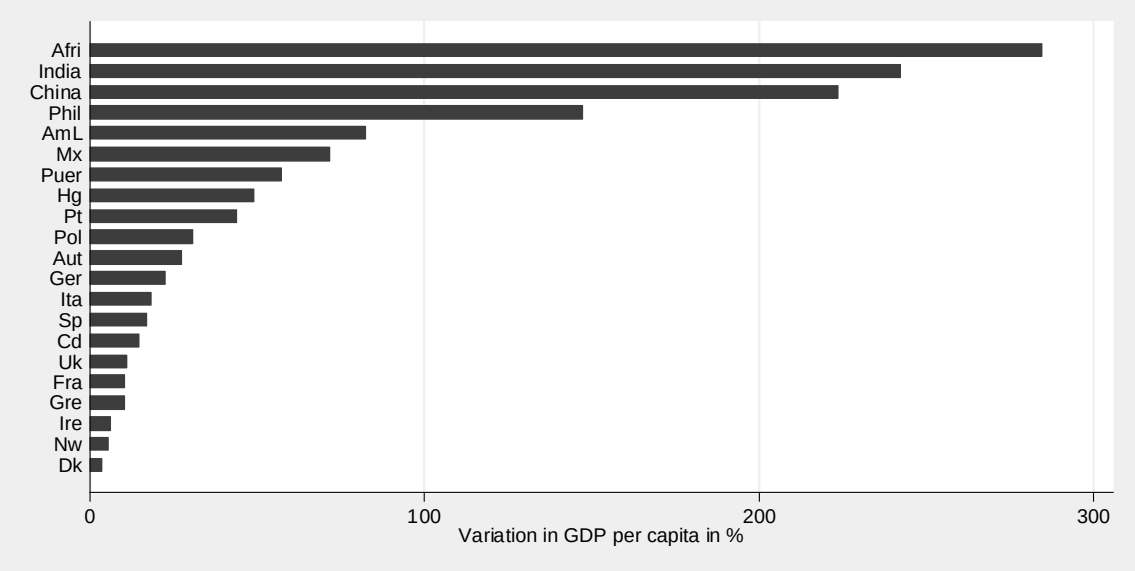

Figure 4: Predicted variations in GDP per capita in period 2000-2003 if the level of inherited trust of people in working age were the same as in Sweden, without controlling for country fixed effects.

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:

$$\Delta y_{ct} = \Delta a_{ct} + \alpha \Delta k_{ct} + (1-\alpha)(\Delta h_{ct} + \Delta \ell_{ct}) \tag{13}$$

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 TFP read $\Delta a_{ct} = \log(A_{ct}) - \log(A_{\bar{c}t})$. TFP is calculated as the traditional Solow residual of equation (13).

In lines with our previous analysis, causality could go both direction for 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 to the students how to behave cooperatively. Similarly, higher employment rates may indicate a more efficient labor market with lower unemployment rates, breeding trustworthiness.

To tackle this issue, we follow the previous strategy by running 3SLS estimates on the system of equations (9) and (10), the dependent variables of equation (9), becoming alternatively $\hat{y}_{ct}$, $\Delta k_{ct}, \Delta h_{ct}, \Delta \ell_{ct}$ or Δa_{ct}. Importantly, we include country fixed effects in these regressions, in particular to control for the role of the quality of institutions. Country fixed-effects may be important since Hall and Jones (1999) showed in their accounting exercises 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 13 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 than 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 13 shows that the main channels through which social attitudes affect production is TFP 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, have also a major effect on TFP. Next, we found a new significant impact of social attitudes on TFP and capital accumulation when the causality link is properly accounted for. This result is at odds with Keefer and Knack (1997) findings based on 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 Hall and Jones (1999) proxies for social infrastructures. Our contribution is to show that controlling for reverse causality is key to isolate the specific significant impact of social attitudes on productivity and capital accumulation. Moreover, this strategy enables us to gauge the consequences of changes in social attitudes on the evolution of institutions favorable to capital accumulation and innovation.

Table 9: Decomposition of the impact of social attitudes on production inputs

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

3SLS estimates. Periods 1949-1952 and 2000-2003. Trust in home countries is instrumented by trust of second-generation Americans, lagged GDP gap and country dummies

4.5 Trust and institutions

This subsection further explores the additional channels through which social attitudes might affect economic development. In a challenging paper, Rodrick et al. (2004) asserted that "institutions rule, or the primacy of institutions over geography and economic integration in economic development". Our empirical strategy enables us to stress the specific contribution of another factor, social attitudes, when controlling for the other potential candidates such as institutions and geography captured by our country fixed effects. There are good reasons to think that some ingredients of norms and attitudes are embedded in invariant institutions such as the legal origins. This component is obviously indistinguishable, but our strategy sheds light on the role of changes in social attitudes independently of invariant features. What we capture are thus norms, attitudes or beliefs which are not embodied in, say, history and invariant institutions, but which affect directly economic development. For instance property rights might be expected to be respected in countries in which cooperative attitudes are deeply ingrained even if they are not enacted into laws. Rodrick et al. (2004) gave the example of the flourishing investment from entrepreneurs in China compared to Russia even if the former country still retains a socialist legal system while the second has enacted a formal private property right regime.

Now, it might also be the case that social attitudes cause macroeconomic performance by

influencing changes in other traditional factors of growth such as changes in institutions. To investigate this issue, we need time-varying indicators for institutions since the post-war period. To the best of our knowledge, no institutional indicator on the regulation of property rights exists for such a long period. The traditional proxies used in the literature, such as the International Country Risk Guide (ICGR) providing information on the corruption of the government, date back since the early 1980s at best. Yet we can use information provided by Gurr (1990) on changes in the executive constraints in different countries since the 19th century. Countries are scored on a 1 to 7 scale depending on the extent to which the executive of a country is allowed to rule by decree or needs the consent of others before acting. This variable has the value-added to be highly correlated with the traditional property right indexes (Knack and Keefer, 1997) and to display time-variation over the post-war period. We use the value of this indicator under the two sub-periods 1949-1952 and 2000-2003.

Table 10 reports the 3SLS estimates of the system of equations (9) and (10) over the two periods 1949-1952 and 2000-2003. The dependent variable of equation (9), is now the gap in the executive constraints indicator relatively to Sweden. Trust in the home countries is still instrumented by trust of second-generation Americans. All regressions include fixed effects and past economic conditions captured by the lagged value of the income per capita gap relatively to Sweden.

Table 10 - col.1 shows that the first stage regression remains similar to previous estimates with a statistically highly significant correlation between trust by country of ancestry and trust in the home countries. Table 10 - col.2 shows a positive influence of changes in trust on the evolution of executive constraints. The effect is statistically significant at the 1 percent level.

Our instrumental strategy allows us to argue that a higher level of inherited trust is conducive to more efficient institutions that favor economic development. Nevertheless, inherited trust is likely to be influenced also by the quality of past institutions, as suggested by the significant correlation of lagged GDP with inherited trust in the first stage regression.

4.6 Overidentification tests

We investigate the validity of our macroestimates by using overidentification tests. Our instrumental strategy is relevant only as long as social attitudes of second-generation Americans are truly exogenous as regards economic development in the home countries. In lines with the previous strategy described above (see section 3.4.2), we use several 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

Table 10: Impact of social attitudes on Executive constraints: 3SLS estimates

	Trust in home countries	Executive constraints
	(1)	(2)
Trust in home countries		30.239^{***}
(IV by (1))		(4.297)
Trust of second-generation	$.208^{***}$	
Americans	(.068)	
Lagged gap in GDP	Yes^{***}	Yes^{***}
Country dummies	Yes^{***}	Yes^{***}
Adj-R^2	.974	.789
Observations	45	45

3SLS estimates. Period 1949-1952 and 2000-2003. rust in home countries
is instrumented by trust of second-generationAmericans, lagged GDP gap and country dummies.

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.

To select Americans whose wave of immigration is higher than the second-generation, 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 higher 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 origins on social attitudes of these cohorts of Americans, we run exactly the same probit estimate on the probability that they answer yes 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?*". 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 groups.

The results of the overidentification tests are reported in Table 11. Column (1) gives the first stage estimates of the effect of social attitudes of the two cohorts of Americans, whose wave of immigration is higher or equal than the third 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 overidentitifcation tests lead to the same conclusion without these additional controls. Column (1) shows that social attitudes of Americans descendants of later immigrants 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 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 8 - Column 3.

Eventually, we perform different tests of overidentification. We first perform a χ^2 overidentification tests assessing whether the 3SLS coefficient for GDP per capita estimated with the instrument of social attitudes of Americans whose wave of immigration is higher than the second-generation is significantly different as the one estimated using social attitudes of second-generation Americans in addition to the previous "genuinely" exogenous instrument. Table 11 - 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 11 - Column (4) reports an easy-to-interpret test consisting in directly adding in the second stage regression the instrument of social attitudes of second-generation Americans. 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 11 - Column (4), trust of second-generation Americans has a statistically insignificant direct effect on GDP per capita and this direct effect would come in negative sign when we already control for another instrumented value of social attitudes in the home countries.

5 Conclusion

This paper has provided a new empirical strategy to uncover the causal effect of cooperative and social attitudes on economic development. By using the level of trust of second-generation Americans as an instrument for social attitudes in the home countries, we have been able to

Table 11: 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 later 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 from later waves of immigration. Col. (3) use social attitudes in the home countries instrumented by both trust of second-generation Americans and of later waves of immigration.

All specifications control for country fixed effects and lagged values of GDP per capita

identify an exogenous variation in social attitudes which varies both across-countries and over-time. The time-varying dimension of social attitudes has enabled us to identify genuine causal relation from social attitudes towards macroeconomic performance by controlling for country fixed effects. Moreover, this strategy enables to isolate the specific contribution of social attitudes relatively 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 social attitudes have a significant causal impact on macroeconomic outcomes.

A challenging questions is the channel through which social attitudes affect economic development. This paper has quantified the direct link from social attitudes to economic development through production inputs. Most of the effect transits through total factor productivity and physical and human capital. Yet social attitudes could also have an effect on macroeconomic performance through institutions such as positive social infrastructures and property rights. This paper has provided some temptative evidence on such effect of social attitudes on legal constraints restricting the executive power. Yet enlarging the causal link from social attitudes to institutions requires more research on the long-run evolution of institutions such as property rights legislation. Conversely this research agenda might be promising to study the reverse effect of changes in institutions on the evolution of cooperative attitudes. This is a prerequisite to identify which institutions and public policies are conducive of 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, the income, the age, the employment status and the 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 in all 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 in 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 in working age between 2000-2003 , and people who were born during the period 1884-1934 and were in 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 in 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 the 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 for 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 in 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.

In order to uncover the social attitudes of people of working age in the period $t = 1$ we assume that initial changes in social attitudes are constant within generations. Denoting by S^0_{c2} the conditional average (estimated with the equation (A2)) of social attitudes of "old" people (who are not any more in 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 it 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 heteroskedascticity.

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
Phillipines	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
Morroco	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