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Trust and the wealth of nations

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Abstract: In this article, we survey a growing body of evidence showing the effects of trust on the wealth of nations. It is important to understand the mechanisms through which trust affects the wealth of nations. This article suggests that trust has effects on the wealth of nations mainly through five channels. These channels are: (a) investment in human and physical capital, (b) financial development, (c) public expenditures, (d) regulations and institutions and (e) the organization of firms.

Key words: Trust, investment, public expenditures, institutions, regulations, delegation

I Introduction

Since Adam Smith the most important questions in the field of economic growth and development are: Why are some countries much richer than the others? What are the factors that bring economic prosperity? Not only economists but also anthropologists, political scientists and historians ask these questions to themselves (Acemoglu and Robinson, 2012; Diamond, 1997; Landes, 1998; Olson, 1982). As Nobel laureate economist Robert Lucas Jr. (1988: 5) says: 'The consequences for human welfare involved in questions like these are simply staggering: once one starts to think about them, it is hard to think about anything else.' Geography (soil quality, climate, natural resources and ecology), culture (values, norms and preferences) and the quality of institutions (rules, regulations and policies) have been seen as fundamental factors that explain the wealth of nations (Acemoglu *et al.*, 2005; Guiso *et al.*, 2006; Sachs, 2001; Spolaore and Wacziarg, 2013; Tabellini, 2008).

In this article, we focus on trust as a determinant of the wealth of nations. Trust, basically defined as the propensity of a population to trust other people whom they do not know personally, is one of the most important ingredients of social capital (see Guiso *et al.*, 2006; Tabellini, 2008). Fukuyama (1995: 26) defines trust and social capital as follows:

> Trust is the expectation that arises within a community of regular, honest, and cooperative behavior, based on commonly shared norms, on the part of other members of that community … Social capital is a capability that arises from the prevalence of trust in a society or in certain parts of it. It can be embodied in the smallest and most basic social group, the family, as well as the largest of all groups, the nation, and in all the other groups in between. Social capital differs from other forms of human capital insofar as it is usually created and transmitted through

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cultural mechanisms like religion, tradition, or historical habit.

Trust is almost everywhere in our economic and social life. Nobel laureate economist Kenneth Arrow (1972: 357) argues that '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.' In their seminal works, Banfield (1958), Puthnam (1993) and Fukuyama (1995) underline the importance of trust for economic and institutional development. Following in the footsteps of these pioneering works, empirical literature shows that trust has positive effects on economic growth and development (Algan and Cahuc, 2010; Hovarht, 2013; Knack and Keefer, 1997; Knack and Zak, 2001).[1] It is important to understand the mechanisms through which trust affects the wealth of nations. Based on the previous literature we can say that trust mainly affects economic growth and development through (a) investment in human and physical capital, (b) financial development, (c) government expenditures and revenues (welfare state), (d) regulations and institutions and (e) the organization of firms.

In this article, our aim is to provide an analytical review on these channels through which trust affects the wealth of nations.[2] The rest of the article is organized as follows: Section II discusses channels through which trust might affect the wealth of nations. Section III concludes by discussing future works and policy implications.

II Understanding mechanisms

1 Investment in human and physical capital

Human and physical capital have played a central role in the theory of economic growth (see Acemoglu, 2009; Aghion and Howit, 2009). Trust might affect the wealth of nations through accumulating human and physical capital. Figures 1 and 2 show the partial regression lines for the effect of trust on education and physical capital. We use a proxy for the level of trust from World Values Surveys (WVS), LatinoBarometro, Asian and East Asian Barometers, AfroBarometer and Danish Social Capital Project. We follow the previous literature by measuring the level of trust as the share of respondents in each country answering yes to the following question: 'In general, do you think most people can be trusted?' Human capital is measured as the share of population aged 25 and over that has completed secondary education. These data are from Barro and Lee (2010). Physical capital per capita is calculated according to the perpetual inventory method. These data are from Caselli (2005). As is evident, the partial regression lines show that trust is a predictor of human and physical capital. These positive correlations are in line with the interpretation that high trust countries have more educated population and higher physical capital and are consistent with the previous findings that we discuss next.

In one of the earliest attempts in this literature, Knack and Zak (2001) develop a general equilibrium growth model and provide some empirical results that indicate trust has positive effect on physical capital. In their model, individuals of varying types are randomly matched in each period with brokers of varying types, where trust changes with differences in type. Brokers have more information about the return on investment than their clients. Therefore, brokers have a moral hazard problem. Individuals spend time to verify their brokers' fealty. While they spend time on this investigation, they take their time from production and forgo wage earnings. In a high-trust country, less time is spent on investigating brokers' attitudes. As a result, they predict that high trust countries invest and produce more than low trust countries. Knack and Zak (2001) collect data for 41 countries and use a cross-country empirical analysis to test this prediction. Their results show that investment (as a percentage of GDP) and

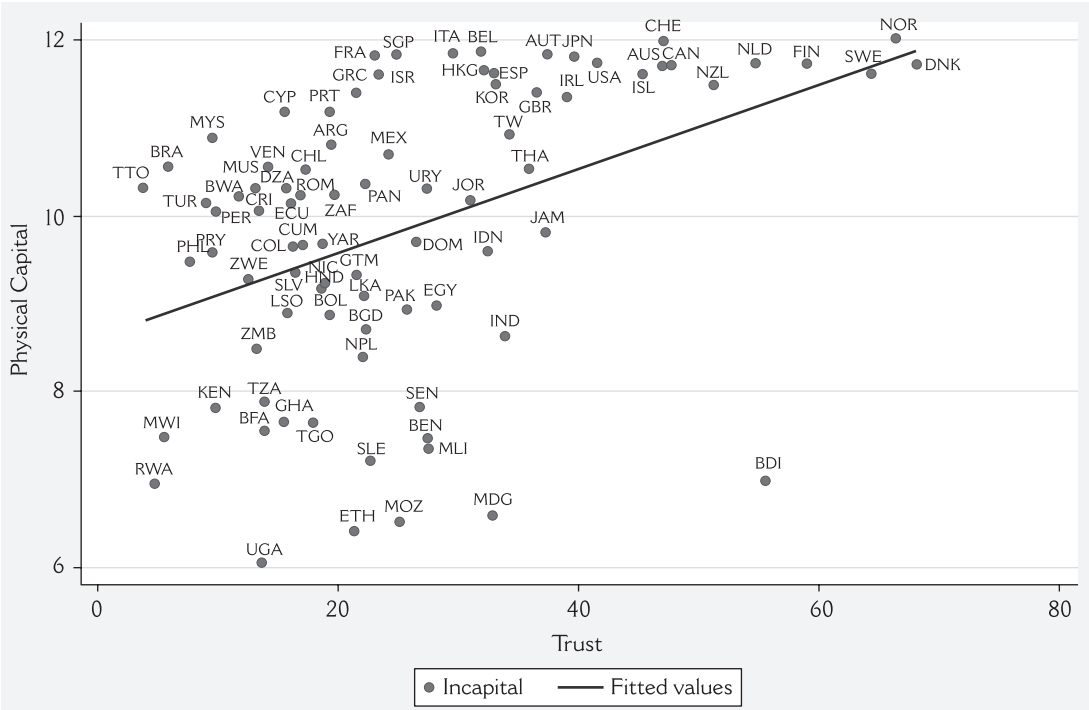

Figure 1 Trust and physical capital

Source: Trust is taken from World Values Surveys (WVS), LatinoBarometro, Asian and East Asian Barometers, AfroBarometer and Danish Social Capital Project. Physical capital is taken from Caselli (2005).

GDP growth are higher in high-trust countries. To correct for possible endogeneity, they use Catholic, Muslim and Christian Orthodox shares of each population as instrumental variables (IV) for trust. Their two-stage least squares (2SLS) estimation results show that the exogenous component of trust has positive effect on investment and growth. Coefficients are similar in magnitude to those estimated using ordinary least squares (OLS) method.

In his pioneering work, Coleman (1988) finds that high-school drop outs are lower in communities that are rich in trust and social capital. In parallel with Coleman (1988), La Porta *et al*. (1997) use a cross-country empirical strategy and find that a standard deviation increase in trust increases the percentage of graduates from high school by half of a standard deviation.

There are also some more recent empirical works on trust and human capital that provide a new dimension to this discussion. For example, Papagapitos and Riley (2009) argue that the trust mechanism that affects physical capital formation in Knack and Zak (2001) is also at work in the formation of human capital. The real income earned by an economic agent is broadly a function of the economy-wide physical capital ratio. Therefore, the variables that affect the stock of physical capital will in turn affect the real income. Lower level of trust reduces not only the stock of physical capital, but also real income. Papagapitos and Riley (2009) argue that this creates a disincentive for investment in education. Second, the authors argue that higher level of trust will make individuals more certain that they receive a fair return on their investment in education.

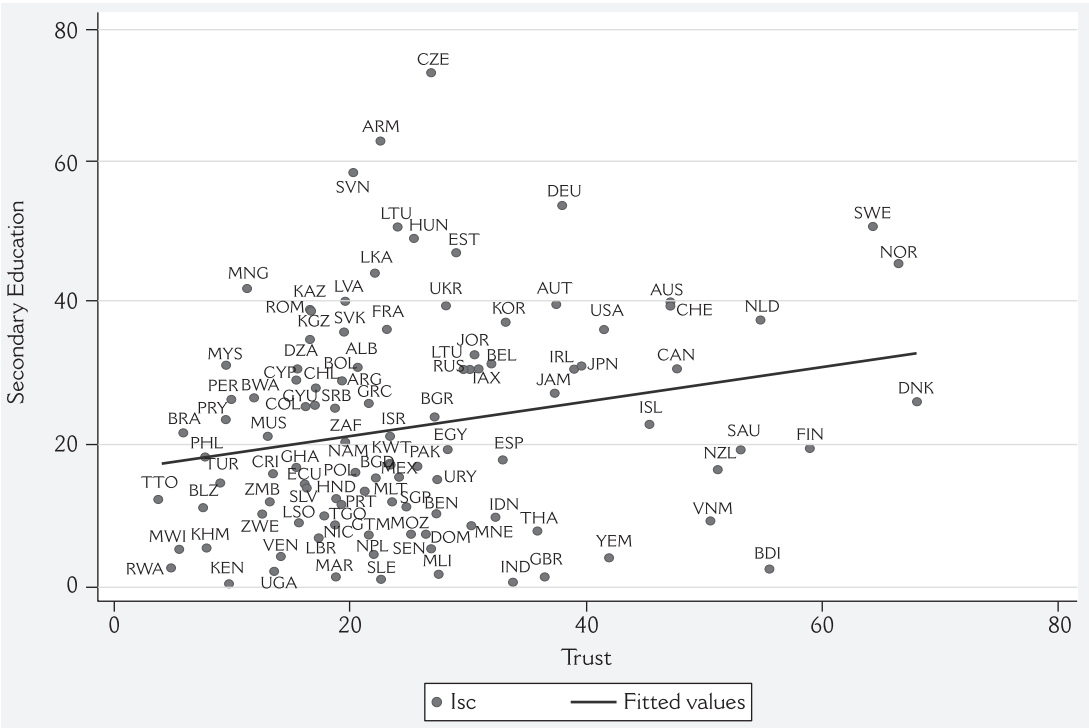

Figure 2 Trust and human capital

Source: Trust is taken from World Values Surveys (WVS), LatinoBarometro, Asian and East Asian Barometers, AfroBarometer and Danish Social Capital Project. Human capital is taken from Caselli (2005).

As a result, individuals will invest more in education. Using a cross-country analysis, they find that trust has positive effect on secondary school enrolment. To check for endogeneity of trust, they use a Hausman test by using income inequality and land inequality as IVs.[3] Their Hausman test result suggests that there is a positive and significant relationship that runs from trust to secondary education enrolment.

Bjørnskov (2009) develops a semi-endogenous growth model to examine the effect of trust on schooling. In this model, firms invest in labour-augmenting technology to the extent that it pays for them. Bjørnskov (2009) argues that this extent is determined by the costs and necessity of monitoring employees with complex work tasks. This determines firms' demand for educated employees, and thus their ability to benefit from potential productivity gains. He also argues that high-trust employees cooperate more and require less monitoring. In low-trust societies, employers will tend to put relatively more emphasis on direct information from trustworthy sources on job applicants' social skills and relatively less emphasis on human capital in order to hedge the risk of hiring a bad employee. As a result, low trust tends to increase transaction costs associated with employing a more educated labour force, and thus lowers the level of education in society. On the other hand, in high-trust countries, firms save in monitoring costs and afford to employ more educated workforce. Therefore, the level of education grows more than in high-trust countries. To test this prediction, the growth of schooling is regressed on trust, initial schooling and initial

GDP per capita. His results show that trust has positive and statistically significant effects on the growth of average and secondary (but not post-secondary) schooling. He also tests whether this empirical finding is the result of reverse causality. Following Uslaner (2002), he argues that corruption is significantly associated with trust. Therefore, he uses corruption as an IV for trust.[4] His IV result also provides support for the notion that trust increases the growth of schooling.

Using a sample of 50 countries from 1976 to 2005, Dearmon and Grier (2011) investigate the effects of trust on the accumulation of human and physical capital. In addition to Knack and Zak's (2001) theoretical channel, Dearmon and Grier (2011) underline that trust increases both the quality and quantity of information. Firms could not only know about a larger variety of investment opportunities, but also more accurately assess their chance of success. Therefore, firms will make more investment on capital. They also show that trust is significantly related to the accumulation of both types of capital. Their results also show that while trust has a linear effect on human capital, it has a non-linear effect on physical capital. Increasing trust in a low-trust country has a greater impact on the accumulation of physical capital than an identical increase in trust in a high-trust country. This result indicates that policies that increase trust would be most beneficial in low trust countries.

Previous empirical literature provides convincing evidence that trust affects both physical and human capital. We should also underline that physical and human capital might also affect the level of trust. Therefore, the direction causality will also run from trust to physical and human capital.

2 Financial development

A large body of research has shown that financial development positively affects economic performance (see Levine, 2005). One of the mechanisms through which trust affects the wealth of nations might be promoting financial development. Sapienza and Zingales (2011: 17) say that:

> Because financial contracts require trust, differential levels of social capital may have important consequences for the way that financial markets develop. Financing is nothing but an exchange of a sum of money today for a promise to return more money in the future. Whether such an exchange can take place depends not only on the legal enforceability of contracts but also on the extent to which the financier trusts the financee.

Figure 3 shows the partial regression line for the effect of trust on financial development. Financial development is measured as the share of private credit by deposit money banks and other financial institutions to GDP. These data are from the Financial Development and Structure Database, which is constructed by Beck *et al*. (2009). The partial regression line shows that trust is positively associated with financial development. This positive correlation is in line with the interpretation that high trust countries have more developed financial markets.

In their empirical paper, Guiso *et al*. (2004) investigate the relationship between social capital (and hence trust) and financial development. Guiso *et al*. (2004) argue that social capital promotes financial development by enhancing the level of trust. They use micro-level data for Italy to identify the effects of social capital on the use and availability of financial contracts. They use two different outcome based measures for social capital: electoral participation and blood donation. The authors expect that regions with high electoral participation and blood donation have higher social capital (and hence trust).

Their results show that, in regions with high social capital, households are more likely to use checks, invest less in cash (least trust-intensive form of investment) and more in stock (most trust-intensive form of investment). In addition to financial investments, lending is also a trust-intensive activity. The lender must trust

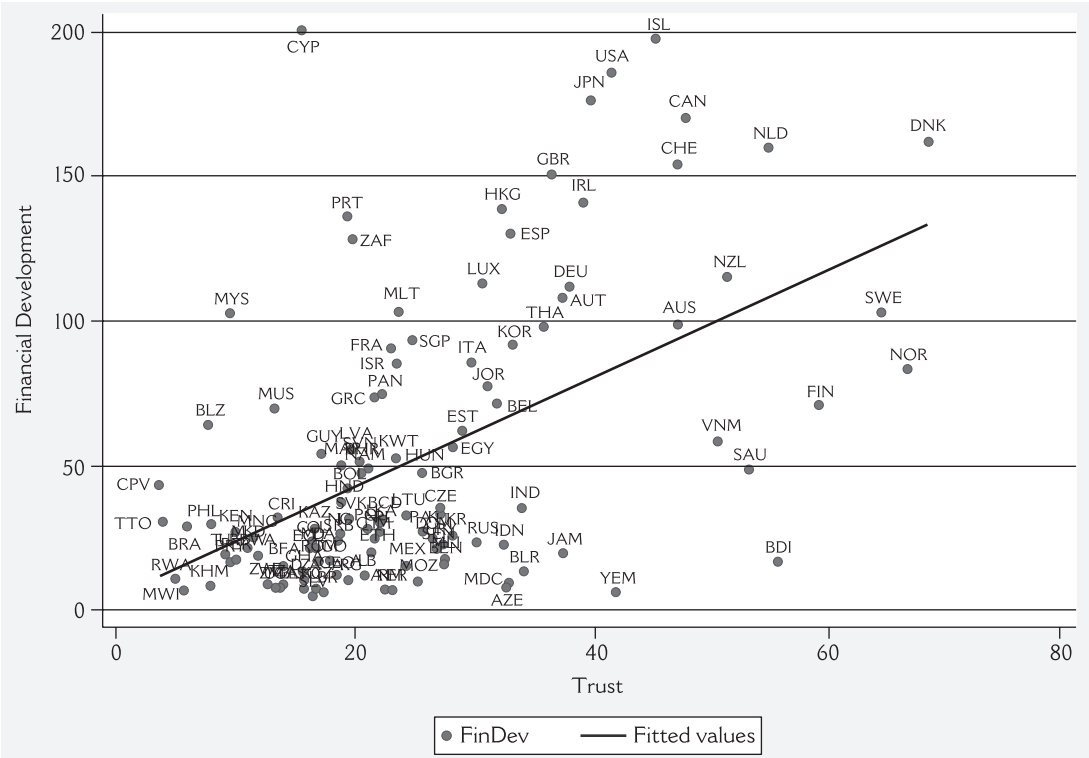

Figure 3 Trust and financial development

Source: Trust is taken from World Values Surveys (WVS), LatinoBarometro, Asian and East Asian Barometers, AfroBarometer and Danish Social Capital Project. Financial development is from the Financial Development and Structure Database.

that the borrower will not run away with the money. Therefore, the authors expect to find that households are not credit constrained or discouraged from applying credit in regions with high social capital. As expected, they find that social capital is negatively associated with the probability of not having access to credit. When households do not have access to formal lending due to the lack of social capital, they will ask debt from their friends or relatives. Guiso *et al*. (2004) find that households from regions with low social capital are more likely to receive loans from friends or relatives. They also predict to find that the importance of social capital in enhancing trust is larger when legal enforcement is weak and is more pronounced among less-educated people. Their results also confirm this prediction.

In another paper, Guiso *et al*. (2008) investigate whether individual level trust, rather than the average level of trust of the community, affects stock market participation. Guiso *et al*. (2008) develop a theoretical model in which the decision to invest in stocks depends not only on the objective expected return given the existing data but also on trust that the data on firms are reliable and that the overall system is fair. Frauds (e.g., Enron and Parmalat) reduce individuals' trust on market data and make them believe that they are cheated. Their model predicts that less trusting individuals are less likely to invest in stock markets. To test this prediction, the authors

use Dutch National Bank (DNB) Household survey. Empirical results show that trusting others increases the probability of buying stock by 50 per cent of the average sample probability and raises the share invested in stock by 3.4 percentage points.

In a more recent work, Guiso *et al*. (2009) argue that differences in the level of international trade and financial flows between countries can be explained by bilateral trust. They use macro-level data to examine whether bilateral trust affects international trade and financial flows. Their OLS results show that higher bilateral trust leads to more trade and financial (portfolio investment, and foreign direct investment) flows between two countries even after controlling for other characteristics of these countries. In other words, a country's citizens are more willing to invest in (or trade to) another country when they trust the other country's citizens more. But, the authors underline that there are three main reasons to worry about these OLS results. First of all, it is possible that international trade and financial flows affect bilateral trust. Second, bilateral trust can capture the effects of some omitted variables. Lastly, potential measurement errors in the bilateral trust variable might create problems. To address these issues, the authors follow a generalized method of moments instrumental variables estimator (GMM-IV) strategy by using commonality of religion and somatic distance as IVs for bilateral trust. Guiso *et al*. (2009) expect that two countries with the same religion will trust each other more because they have similar cultures. They also expect people trust others more when they look like them more. They use an indicator of somatic distance, which is based on the average frequency of specific traits (hair colour, height, etc.) present in the indigenous population. The authors find that religious similarity and somatic distance are important determinants of bilateral trust and they pass standard IV tests. GMM-IV results also confirm that bilateral trust has significant effects on international trade, portfolio investments and foreign direct investments.

By the way, it is important to clarify some issues about IVs. It is usually difficult to pick valid instruments. A valid instrument must satisfy two conditions. First, the instrument must be correlated with the endogenous explanatory variable (trust in our case). Second, the instrument must be uncorrelated with the dependent variable other than through its correlation with the endogenous explanatory variable. In other words, the instrument must be exogenous. The first condition can be easily test with using a standard F-test. But, there is no direct test for the second condition. When there are multiple instruments, as in Guiso *et al*. (2009), the Sargen-Hansen test of over identifying restrictions is used. But, it tests only one of the validity of the over identifying instruments. So, it does not guarantee that all the instruments are valid (see Cameron and Trivedi, 2010; Wooldridge, 2002). Therefore, it is not obvious that instruments meet the exclusion restriction. In sum, readers should interpret not only IV results of Guiso *et al*. (2009), but also other IV results that we mention throughout our article with some caution.

3 Public expenditures and revenues

Trust might affect the wealth of nations through increasing public expenditures and revenues (welfare state). Previous literature confirms that development-friendly public expenditures (such as education and infrastructure) have positive effects on economic prosperity (Agenor and Moreno-Dodson, 2006; Aschauer, 1989; Nijkamp and Poot, 2004). Trust could increase development-friendly public expenditures and public revenues, and thus improve individuals' standards of living. To see the relationship between trust and public sector, we use total public expenditures (percentage of GDP) and public revenues (percentage of GDP) from the CIA Factbook. We take

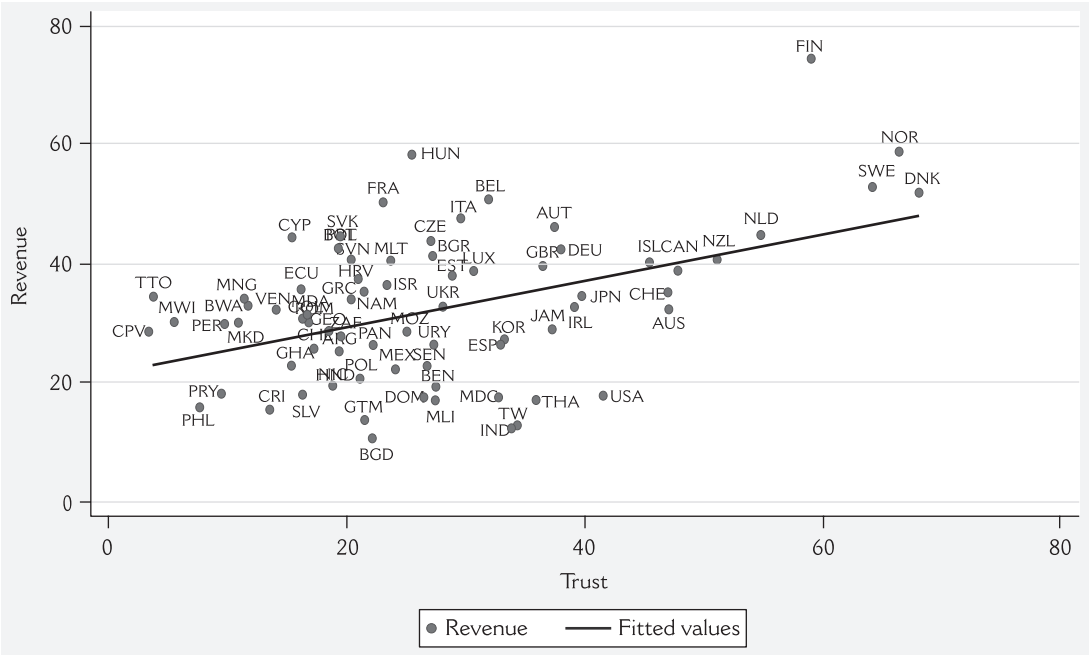

Figure 4 Trust and total public revenues

Source: Trust is taken from World Values Surveys (WVS), LatinoBarometro, Asian and East Asian Barometers, AfroBarometer and Danish Social Capital Project. Total public revenues (% of GDP) data is from the CIA Factbook.

them from Berg and Bjørnskov (2011). As can be seen from Figure 4, there is a positive correlation between trust and total public revenues. Figure 5 shows that there is a positive correlation between trust and total public expenditure. These positive correlations are consistent with the theoretical and empirical findings that we discuss next.

In their theoretical model, Ponzetto and Troiano (2012) show the role of trust in creating incentives for politicians to invest in public education expenditures. Trust increases civic engagement, which in turn makes each individual more likely to acquire political information. Trust also allows individuals to share their information with a wider network of strangers. An increase in information acquisition and sharing makes voters more aware of all government activities. These voters offer greater electoral rewards for public investment. Rational politicians respond this by increasing public expenditures that favours all. In order to test their model's prediction, Ponzetto and Troiano (2012) use a cross-country empirical analysis. Their empirical results show that trust increases public expenditures on education.

Universal access to public goods, transfers and services necessitates a larger welfare state and thus requires high taxes. On the other hand, a large welfare state might divert individuals to engage in free riding. In addition to this, high taxes might erode tax morals and increase informal economic activities. Berg and Bjørnskov (2011) hypothesize that trust makes people less likely to engage in free riding and cheat on taxes. Therefore, the authors expect to find a positive relationship between trust and welfare state. In their cross-country analysis, Berg and Bjørnskov (2011) use three IVs to obtain exogenous sources of variation for trust in order to estimate its causal effect

on welfare state. These IVs are a dummy variable capturing whether the predominant language of a country exhibits the pronoun drop characteristic, the average temperature in the coldest month of the year and a dummy for the existence of monarchical institutions, such as countries being 'ruled' by a king, emperor or other sovereign. Justifications for the variables being utilized as instruments variables are as follows: Tabellini (2008) argues that languages that allow the personal pronoun to be dropped tend to give less emphasis to individual rights, which in turn reflect a culture of mistrust. It has been argued that people are more dependent on strangers for survival in relatively colder climates.[5] Therefore, the average temperature in the coldest month will affect the level of trust. Lastly, Bjørnskov (2007) finds and argues that people living in monarchies are more trusting because having a monarch family might provide social stability and represent a symbol of unity. Using this instrumental variables strategy, Berg and Bjørnskov (2011) find that trust increases total public expenditures and revenues. These results indicate that trust facilitates the sustainable existence of a welfare state. We should again underline that while these IVs pass standard tests, this does not guarantee that all the instruments are valid. In Berg and Bjørnskov's (2011) paper, IVs are far from perfect. Therefore, IV results should be interpreted with some caution.

4 Institutions and regulations

Better institutions and regulations have been widely regarded as necessary conditions for fostering growth and increasing economic prosperity (Acemoglu *et al.*, 2001; Djankov *et al.*, 2006; Haidar, 2012; Hall and Jones, 1999). Trust might affect the wealth of nations through increasing quality of institutions and reducing the burden of regulations. Figures 5 and 6 will help us visually to understand theoretical and empirical papers that we discuss later. Rule of law and entry

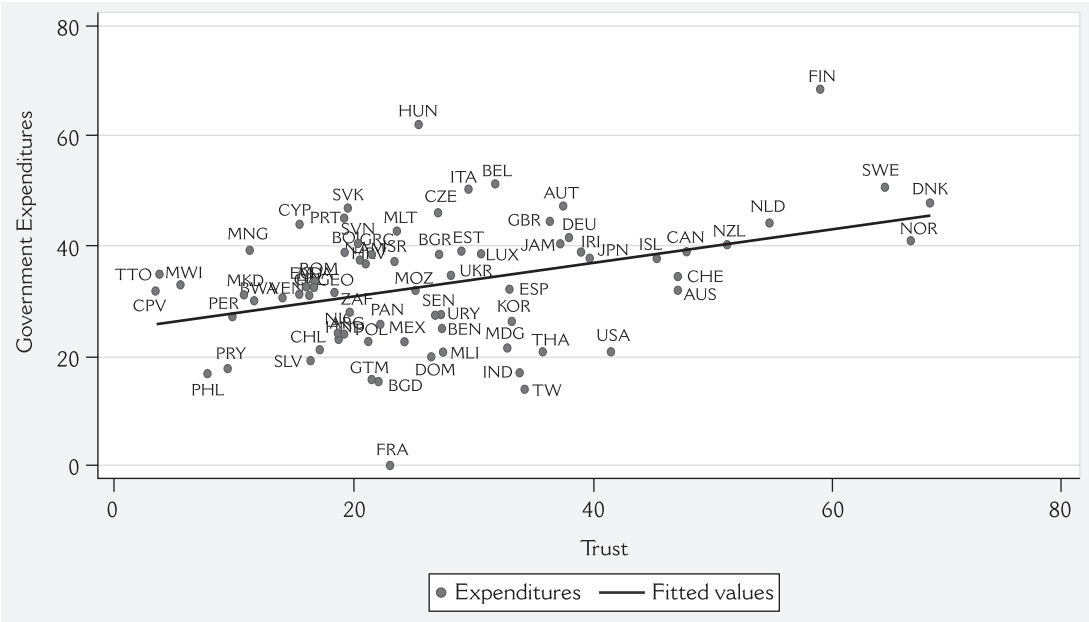

Figure 5 Trust and total public expenditures

Source: Trust is taken from World Values Surveys (WVS), LatinoBarometro, Asian and East Asian Barometers, AfroBarometer and Danish Social Capital Project. Total public expenditures (% of GDP) data is from the CIA Factbook.

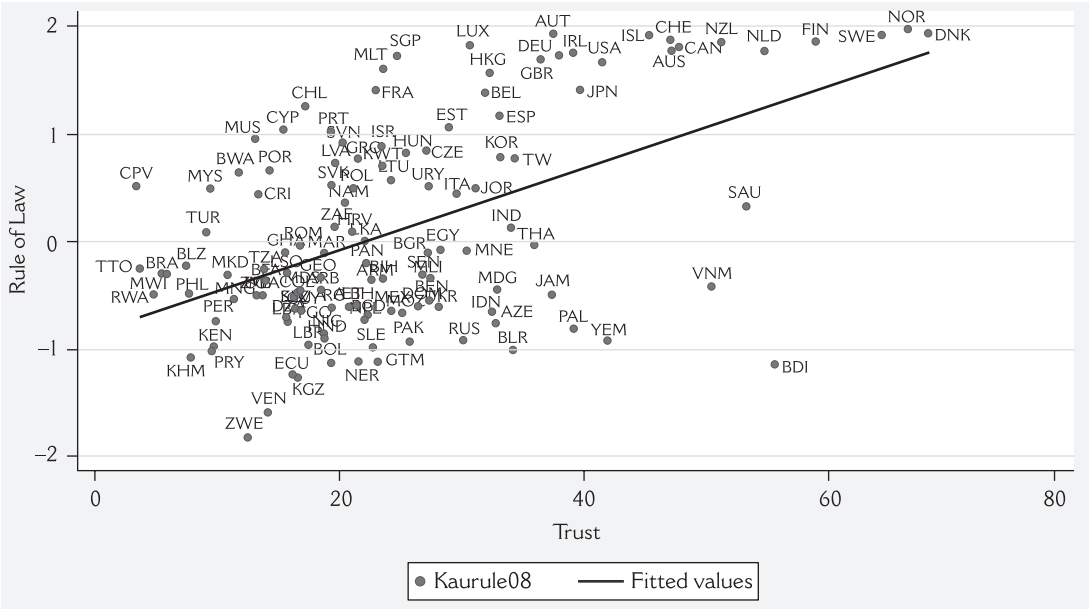

Figure 6 Trust and rule of law

Source: Trust is taken from World Values Surveys (WVS), LatinoBarometro, Asian and East Asian Barometers, AfroBarometer and Danish Social Capital Project. Our measure for rule of law is from the Worldwide Governance Indicators.

regulations have been widely used as indicators for the quality of institutions and the burden of regulations. Our measure for rule of law is from the Worldwide Governance Indicators. As a measure for regulations, we use entry regulation data (natural log of time it takes to obtain legal status to operate a firm) from Doing Business. Figure 6 shows that there is a positive relationship between trust and rule of law. On the other hand, Figure 7 shows that there is a negative relationship between trust and entry regulations.

According to Fukuyama (1995), trust is needed to establish strong cooperation among strangers, and this cooperation allows the formation of large organizations. Following this idea, La Porta *et al*. (1997) argue that government is a large organization in which bureaucrats must cooperate with some other bureaucrats and citizens to provide public goods properly. Since trust creates this strong cooperation, it makes government and its institutions more effective. Using a cross-country analysis, they test whether trust affects government effectiveness and the quality of institutions. To measure government effectiveness and the quality of institutions, La Porta *et al*. (1997) use different survey-based estimates of the efficiency of the judicial system, corruption, bureaucratic quality and tax compliance. Their OLS results show that trust is an important determinant of government effectiveness and the quality of institutions.

In a more recent paper, Bjørnskov and Meon (2013) test whether exogenous variations in trust determine both the quality of institutions and the level of education, which in turn both determine economic growth and labour productivity. The authors argue that the main mechanisms through which trust determines the wealth of nations are improving the quality of institutions and increasing education level. Using cross-country

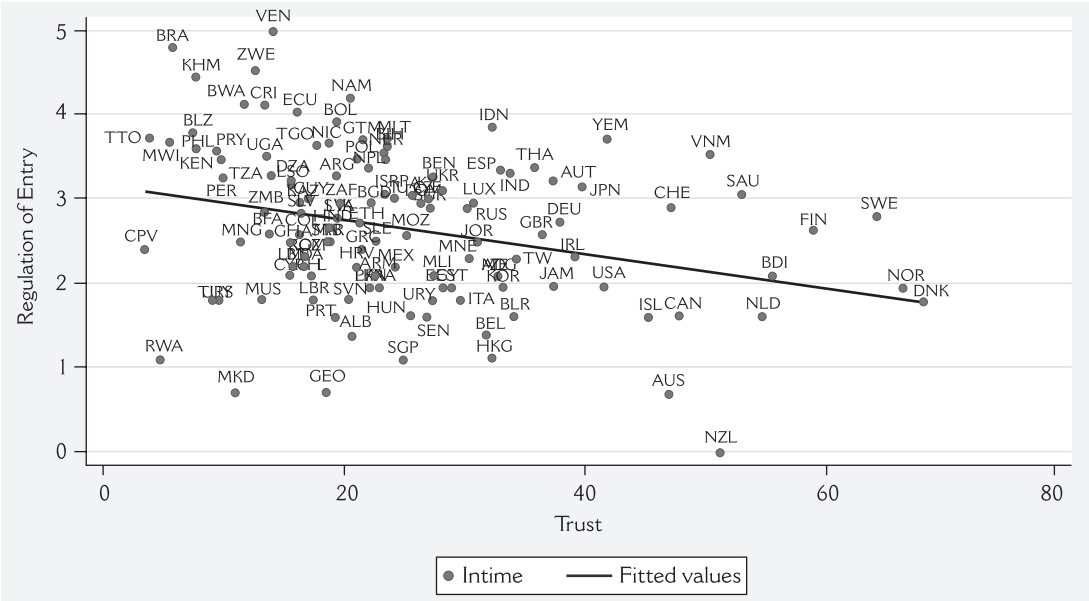

Figure 7 Trust and regulation of entry

Source: Trust is taken from World Values Surveys (WVS), LatinoBarometro, Asian and East Asian Barometers, AfroBarometer and Danish Social Capital Project. Our proxy of entry regulation is from Doing Business.

regression models, they establish several causal relations.

First of all, they use four IVs in order to determine exogenous variations in trust. First three instruments are the ones that we discussed earlier: a dummy variable capturing whether the predominant language of a country exhibits pronoun-drop characteristic, the average temperature in the coldest month of the year, and a dummy variable capturing whether a country is a monarchy. The last one is a different one: the ratings of the aesthetics of national flags. In these ratings, flags with either maps, writing or symbols on them are assigned lower values since these features only exist in the flags of younger and poor countries, and tend to be associated with countries with difficult beginnings. The authors argue that the flag ratings might be good proxy for countries characterized by low trust level at independence. But, it is important to note that aesthetic characteristics of national flags seem a shaky instrument. Readers should keep in mind that this instrumental variable cannot be truly exogenous.

As a second step, Bjørnskov and Meon (2013) run 2SLS regressions to show whether exogenous variations in trust affect institutions and education. Their 2SLS results show that trust has positive effects on the quality of institutions and the level of education. As a third step, they run three-stage least-squares (3SLS) regressions, where both institutions and education are regressed on trust, and the measures of economic prosperity (GDP per capita and GDP per worker) are regressed on institutions and education. Their 3SLS results show that an increase in trust improves the quality of institutions and increases the level of education, which in turn fuels economic prosperity.

In another cross-country analysis, Bjørnskov (2010) investigates whether the relationship between trust and the quality of institutions is a reflection of the political responsiveness to demand of voters or the

supply of honest politicians and bureaucrats. Bjørnskov (2010) argues that trust might affect the quality of institutions through the demand of voters (electoral). Trust makes individual more civic. Such civicness leads to higher political accountability because civic individuals follow political actions carefully, acquire and share political information more and demand more transparency from the government. This is the demand channel through which trust might increase political transparency, and thus improve the quality of institutions. He also argues that the supply of honest politicians and bureaucrats is higher when the level of trust is higher. If politicians and bureaucrats are honest, they will be more effective at implementation of laws and policies.

Bjørnskov (2010) uses different proxies for the quality of institutions. These are: (a) the Kaufmann index of overall governance, (b) the Fraser institute legal quality index, (c) the transparency international measure of corruption and (d) the Polity IV and Vanhanen indices of democracy. His cross-country results show that while trust has positive and statistically significant effects on overall governance, legal quality and control of corruption, it has no significant effect on democracy. To separate electoral and bureaucratic mechanisms, he suggests looking for whether the effect of trust varies with the degree of political competition. He adds an interaction term between trust and a measure of political competition.[6] If this interaction term is positive and statistically significant, it will suggest that trust affects the quality of institution through electoral mechanisms. Empirical results show that the effect of trust on the quality of institutions is stronger in countries with higher degree of political competition. This result indicates that the effect of trust comes mainly through the political responsiveness to demand of voters.

There are also important studies that analyze the relationship between trust and regulations. In a cross-section of countries, Aghion *et al*. (2010) find that government regulations are strongly negatively correlated with trust. They present a simple model to explain this correlation. Their model has two equilibriums. In the good equilibrium, everyone is civic. Given that more civic people trust others more, individuals do not expect that others will impose negative externalities and mistreat them. Therefore, individuals have no reason to demand regulations for externalities and mistreatments. In this equilibrium, trust eliminates the demand for regulations. On the other hand, everyone is uncivic in the bad equilibrium. This creates a low trust society. In a low trust society, individuals expect that others will impose negative externalities and mistreat them. Therefore, individuals in a low trust society want to have more regulations that internalize negative externalities and prevent mistreatments from others. In the empirical part of their paper, Aghion *et al*. (2010) use both macro and micro level data sets. Their macro-level analysis shows that trust reduces regulations on firm entry, labour markets and courts. In their micro-level analysis, they use World Value Survey and Life in Transition Survey. Their micro results show that trust reduces individuals' demand for regulation and increases support for market economy.

In a similar work, Pinotti (2012) argues that the level of regulation is not exogenously determined, but it is an endogenous outcome. Governments might use heavy regulations in response to market failures caused by the lack of citizens' attitudes for cooperation. Mistrust affects citizens' attitudes for cooperation, and thus creates market failures such as informal economy and negative externalities. Individuals generally try to take advantage of market failures in a low-trust society. As a result, citizens would prefer more government intervention in low trust countries. Pinotti (2012) argues that if market failures explain a great deal of variation in the level of regulations, then previous estimates of the effects of regulations on market failures might be biased. In other words, omitting trust will

bias the estimated effects of regulations on market failures.

To examine whether his prediction is true, he first uses WVS and examines the relationship between trust and the demand for regulation. His micro-level estimation results show that the odds of preferring more regulations are about 15 percentage points lower for trustful individuals relative to non-trustful individuals. Second, he uses macro-level data set and finds that a one percentage point increase in trust is associated on average to a 2 per cent cut in entry regulations. These micro and macro level results suggest that trust affects demand for regulations through market failures. Finally, he tests whether omitting trust biases the estimated effects of regulations on market failures. Before controlling for differences in the level of trust, regulations have positive effects on informal economy and negative externalities (as proxied by water pollution). When he controls for trust, the estimated coefficient of regulations on market failures becomes statistically insignificant. These results suggest that the effects of regulations are capturing omitted variation in the level of trust.

5 Organization structure of firms

Productivity is one of the key drivers of economic growth (see Aghion and Howitt, 2009). As Bloom and Van Reenen (2010a) highlight, poor management practices reduce productivity. Therefore, one should find better management practices to increase productivity. Decentralized decision making has been seen as an important way to make management better in firms, and thus increase firms' performance because it reduces the cost of information transfer and communication, increases firms' speed of response to market changes and improves job satisfaction (Bloom and Van Reenen, 2010b). Does trust affect decentralization? To see the relationship between trust and decentralization, we use a survey based index of the willingness to delegate the authority. This index is from the Global Competitiveness Report. This index is constructed from the answers to the following question: 'In your country would you assess the willingness to delegate the authority to subordinates?' This index ranges from 1 to 7. Higher values indicate high willingness to delegate the authority. As Figure 8 shows, there is a positive correlation between trust and delegation.

In a theoretical and empirical paper, Bloom *et al*. (2012) show that trust increases productivity by affecting the organization of firms. In their model, a CEO has two options to solve production problems. The CEO can solve these problems directly or delegate decisions to plant managers. But, delegation process needs trust. The CEO might not trust the plant managers' decisions because of the misaligned incentives such as corruption, fraud, leaking information, etc. When the CEO does not trust plant managers, there will be less decentralization and more direct intervention from the CEO. Therefore, the CEO will become time constrained due to a large number of decisions. Their theoretical model shows that firm size reduces when the CEO's trust in the plant manager is low because the CEO spends more time on solving problems instead of delegating decisions plant to the manager. Trust helps firms to become more decentralized. This decentralization might improve productivity by supporting large equilibrium firm size. In sum, their first proposition is that trust increases decentralization. Their second is that trust also increases firm size.

In their empirical part, Bloom *et al*. (2012) collect data on the decentralization of investment, hiring, production and sales decisions from corporate headquarters to local plant managers in almost 4000 firms in the United States, Europe and Asia. Their measure of decentralization is an average measure of plant manager autonomy on hiring, capital expenditure, marketing and product innovations. They use WVS to measure trust. They average the generalized

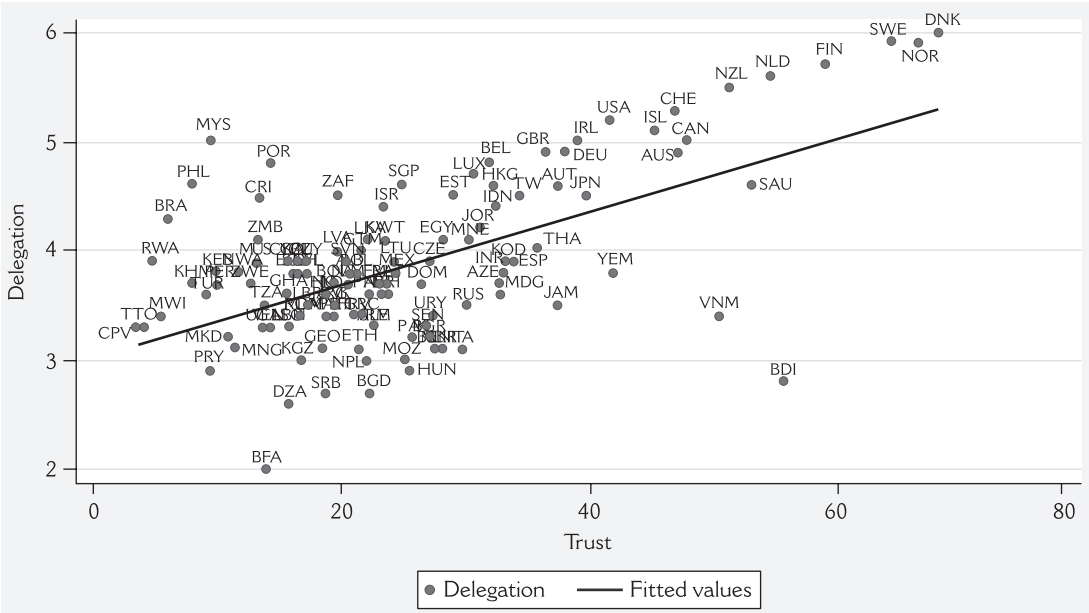

Figure 8 Trust and delegation

Source: Trust is taken from World Values Surveys (WVS), LatinoBarometro, Asian and East Asian Barometers, AfroBarometer, and Danish Social Capital Project. Our index of delegation is from the Global Competitiveness Report.

trust at the region level within countries because they underline that generalized trust might vary within countries. First, they regress the decentralization measure against average trust in the area where the plant's headquarters are located. Their results show that trust is positively associated with decentralization. Their firm level dataset includes firms which have headquarters located in a different geographical area (region or country). Their data include 881 affiliates of multinationals. They use this subsample because it provides two advantages. First, using this subsample, they can include fixed effects for the regional location of the plant, and thus remove any bias associated with other geographical characteristics. Second, when they focus on the sample of multinationals, they can investigate whether trust in the country of origin affects decentralization. Their results show that the effect of trust remains similar even after including fixed effects for the plant's region of location. They also find that high level of bilateral trust between the multinational's country of origin and subsidiary's country of location increases decentralization.[7]

To test their second proposition, Bloom *et al.* (2012) build a measure of average domestic firm size in the region of the plant's location. Then they analyze the relationship between regional trust and average firm size. They find that average firm size is larger in high-trust regions. Given that large firms are important for productivity growth, Bloom *et al.* (2012) underline that trust might play an important role in explaining aggregate productivity.

In an empirical paper, Cingano and Pinotti (2012) follow Rajan and Zingales' (1998) difference-in-difference methodology to estimate the effect of trust on the structure of production. Rajan and Zingales (1998) argue that one way to check whether a channel is at work is to see whether industries that are most affected by this channel perform differentially in countries or regions where that channel is likely to be more operative.

The industry characteristic that Cingano and Pinotti (2012) are interested in is the degree to which an industry depends on delegation. They argue that if trust solves principle-agent problems, and thus increases decentralization, trust will affect high delegation-intensive industries more relative to low-delegation industries. They test whether trust increases value added, export and firm size relatively more in delegation-intensive industries.

Cingano and Pinotti (2012) use micro level data on both Italian regions and European countries. They use the survey on the investments of Italian firms (INVIND) and the European Social Survey (ESS) to measure differences in the intensity of decentralization across industries. Their proxies of the intensity of delegation show that while some industries such as 'manufacture of machinery and equipment' are high delegation intensive, some industries such as 'leather, leather products and footwear' are less intensive. They use WVS in order to measure the level of trust in Italian regions and European countries. Exploiting variation in trust across regions or countries and differences in need-for-delegation of production activities across industries, Cingano and Pinotti (2012) find that trust increases value added, export and firm size more in high delegation-intensive industries relative to low delegation-intensive industries.

III Conclusion

Trust is one of the fundamental factors that affect the wealth of nations. In this article, we review the literature to understand the channels through which trust affects the wealth of nations. This article suggests that trust has effects on the wealth of nations through five channels. These channels are: (a) investment in human and physical capital, (b) financial development, (c) public expenditures and revenues, (d) regulations and institutions and (e) the organization of firms. Trust mainly affects interactions between (a) citizens and public officials, (b) lenders and borrowers and (c) CEOs and managers. The higher the trust, the healthier is the interactions among different economic and political agents. When the interactions are improved by trust, this will make investments, financial markets, public expenditures, institutions, regulations and firms more effective and development friendly.

This article has two main suggestions. First, more works are needed in this literature to understand not only these channels, but also alternative channels. What will be alternative channels through which trust affects growth and development? Saying a few words about this question will help us to find new research questions. First, trust can also affect R&D activities because they need cooperation. Many R&D activities are carried out by cooperation between firms and universities. This cooperation also takes place among different firms. But, this type of R&D activities will cause problems like moral hazard and the theft of science, intellectual property and trade secrets. Therefore, an effective R&D cooperation needs both trust and contract enforcement. In sum trust will also affect growth and development through R&D activities. Regarding this topic, there is an important gap in the existing literature. Therefore, this area offers new opportunities for research. Second, trust will also affect growth and development through affecting individuals' beliefs on policies. Rational individuals generally take into account free riding and tax evasion problems, when they decide whether to support public policies related to development. Therefore, trust on strangers might affect support for public policies. In an ongoing research by a group of academics, we investigate the effect of trust on support for public education expenditures. Medicaid (the US health programme for the poor) is one of the controversial topics nowadays. It will also be interesting to analyze the effect of trust on support for public health policies. In sum, investigating the effect of trust on individuals' beliefs on policies will be another promising research area.

Second, governments, civil society and international organizations should devote more time on analyzing the ways of increasing trust. While there is ample evidence to prove that the level of trust is persistent and shaped by history, there are some papers that show policy makers and NGOs can affect the level of trust. For example, Olken (2011) find that spending more time to watch television and listen to the radio is associated with lower self-reported trust in Indonesia because these activities reduces interactions and cooperation among people. In a more recent paper, Algan *et al*. (2013) test whether teaching practices affect social capital. Their results show that vertical teaching practices, whereby teachers primarily lecture, students take notes or read textbooks and teachers ask students questions, reduce the level of trust. On the other hand, horizontal teaching practices, whereby students work in groups, do projects together, and ask teachers questions, increase the level of trust. These two papers suggest that there are some ways to improve the level of trust in the short and medium run.

Besides these academic works, we have experienced a fall in trust in recent years because of the political and corruption scandals, misbehaviour of commercial and central bankers, high unemployment rate, rising income inequality and oppressive austerity measures. Nowadays people trust less on politicians, bankers, employers and foreigners.[8] This experience also indicates that the level of trust can change in a short period of time. It is true that trust is changing at a slow pace. It is also true that it is difficult to improve the level of trust rather than reducing it. But if we can reduce it, we will also increase it. This should not reduce enthusiasm to work on this field. Policy makers and international community and NGOs should think seriously about the ways of improving trust. Economists, sociologist and political scientists should also cooperate and make field studies to find ways of increasing trust.

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Notes

1. These studies use different approaches to establish a causal relationship trust and growth (development). While they provide suggestive results, it is difficult to find a causal effect. Therefore, results should be interpreted with some caution.
2. It is clear that the level of trust cannot be taken for granted. Therefore, while it is beyond the scope of this article, it is important to shortly mention the roots of trust. Using micro-level data for the US, Alesina and La Ferrera (2002) find that the significant factors that reduce trust are: (a) a recent history of traumatic experiences; (b) belonging to a group that historically felt discriminated; (c) low levels of income and education; (d) living in a racially mixed community and/or in one with a high degree of income disparity. In his micro-level analysis for the US, Uslaner (2002) shows that optimism, confidence in science, education, age, corruption and race are among important factors that affect trust. Using a cross-country analysis, Bjørnskov (2007) find that while income inequality, ethnic diversity and communist heritage reduce trust, Protestantism and having a monarchy increase it.
3. In here, using inequality measures might not be good choices as IVs because inequality can also directly affect human capital.
4. We should be skeptical about the exogeneity of corruption because there are some papers that show corruption affects human capital (see Eicher *et al.*, 2009).
5. This idea goes back to Aristotle.
6. See Bjørnskov (2010) for the construction of this political competition measure.
7. They use religious similarity between the countries as an instrumental variable for bilateral trust.
8. I would like to thank an anonymous referee for raising this issue.

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