# Trust-based social capital, institutions, and development

Mina Baliamoune-Lutz [a,b,]*

[a] *Economics, University of North Florida, 1 UNF Drive, Jacksonville, FL 32224, USA*
[b] *ICER, Turin, Italy*

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## ABSTRACT

We estimate fixed-effects and Arellano–Bond GMM equations using panel data from a large group of developing countries and test whether trust-based social capital, proxied by *contract-intensive money*, complements the role of institutions in promoting development. The results we obtain provide robust evidence that social capital enhances the contribution of institutions when we focus on political institutions and weaker evidence when we use civil liberties. Both social capital and institutions have positive effects on income but the relationships these variables have with income tend to be non-monotonic. Moreover, social capital has a positive influence on the effectiveness of human capital.

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## 1. Introduction

After having been somewhat marginalized in development and growth literature in the 1970s and most of the 1980s, institutions became an important area of focus when examining the process of economic development and the success or failure of policy reforms in the 1990s. This was partly a consequence of the failure of many countries that had liberalized and privatized their economies to realize the expected benefits from such reforms. In the 1990s, some transition economies, and several Asian and Latin American countries experienced severe macroeconomic and financial crises in spite of undertaking policy reforms that were presumed by the so-called 'Washington Consensus' to be powerful cures for many macroeconomic problems. Recent studies have focused on the role of institutions as a major determinant of development policies and reforms, and as a primary factor of the state of backwardness of certain regions (Acemoglu et al., 2002, 2003; Rodrik, 2002; Rodrik et al., 2004; Addison and Baliamoune-Lutz, 2006; Iyigun and Rodrik, 2006; Baliamoune-Lutz and Ndikumana, 2007). Recent empirical evidence shows that once institutions are included in income (or growth) equations, trade appears to have no effect,

and the effect of geography becomes much weaker (Rodrik et al., 2004).

Another recent strand of the literature has focused on the relationship between informal institutions (or social structure) and economic performance (MacKenzie and Millo, 2003; Mouw, 2003; Granovetter, 2005; Gomez and Jehiel, 2005). Some studies have focused in particular on the role of social capital in the form of cooperative behavior, norms and values in a society that serve to enhance trust among individuals and facilitate transactions by reducing (or even eliminating) costs associated with acquiring information and with monitoring (Coleman, 1990; Putnam, 1993; Knack and Keefer, 1997; Ostrom, 2000; Woolcock and Narayan, 2000).

The main goal of this paper is to empirically examine the role of social capital in enhancing the development effects of institutions. We estimate fixed-effects and Arellano–Bond Generalized Method of Moment (GMM) models, using panel data from 39 African countries for the period 1975–2001, and test whether trust-based social capital, proxied by contract-intensive money, complements the role of institutions in promoting development. The empirical results we obtain provide evidence that social capital enhances the contribution of institutions. We show that both social capital and institutions have positive effects on income but the relationship these variables have with income is, in general, non-monotonic. Moreover, social capital seems to enhance the development effects of human capital.

* Correspondence address: Dept. of Economics, University of North Florida, 1 UNF Drive, Jacksonville, FL 32224, USA. Tel.: +1 904 620 1223.
   *E-mail address:* mbaliamo@unf.edu

The remainder of the paper is organized as follows. In the next section we discuss institutions and social capital and briefly review recent research on social capital in Africa. Section 3 presents the variables and the methodology we employ in the empirical analysis. Section 4 reports the estimation results and comments on the findings. Concluding remarks are provided in Section 5.

## 2. Institutions and social capital

### 2.1. Institutions

Among economists Douglas North is widely credited with the revival of interest in institutions and their influence on economic outcomes. North (1990) views institutions as "the rules of the game in a society or, more formally, [they] are the humanly devised constraints that shape human interaction" (North, 1990, p. 3). North distinguishes formal from informal rules (informal institutions). Similarly, Aron (2003) defines institutions as the sets of formal and informal constraints imposed on social, economic and political activities. Measures of institutional quality in the empirical literature include a host of indicators such as property rights (Knack and Keefer, 1995; Zak and Knack, 2001), bureaucratic structure (Rauch and Evans, 2000), and political rights and civil liberties (Kormendi and Meguire, 1985; Scully, 1988; Isham et al., 1997).[1]

Recent work on the role of institutions in economic development includes Knack and Keefer (1995), Kaufmann et al. (1999), Acemoglu et al. (2001, 2003), Rodrik (2002), Rodrik et al. (2004), and Dollar and Kraay (2003). Some empirical studies have shown that institutions can be crucial to the success of economic reforms (see, for example, Dollar and Kraay, 2003; Addison and Baliamoune-Lutz, 2006). However, the relationship between institutions and indicators of development may not always be positive. For example, Dasgupta and Weale (1992) report that per-capita income and life expectancy are positively correlated with improvements in political and civil liberties but literacy has a negative association with political and civil liberties. Moreover, at least from policy-making standpoint, the direction of causality should be an important area to research. Chong and Calderón (2000) show that there is reverse causality between economic growth and institutional quality and that the poorer the country, the stronger the influence of institutional quality on economic growth. It may be that the relationship and the direction of causality between economic development and institutions depend on the level of development and the level of institutional quality. It is also possible that interactions of institutions with the prevailing social structure affect this relationship.

The role of property rights, for example, may be particularly important when countries are implementing reforms, as many African countries have been doing in the late 1980s and throughout the 1990s. As argued by Addison and Baliamoune-Lutz (2006, p. 1031).

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[1] There are various sources of data covering diverse measures or indicators of institutional quality. The Heritage Foundation publishes data on several institutional indicators pertaining to five main areas (1) size of government, (2) access to sound money, (3) legal structure and security of property rights, (4) regulation of capital, labor, and business, and (5) exchange with foreigners. Kaufmann et al. (1999) include in their governance measures the rule of law, voice and accountability, political instability and violence, government effectiveness, and regulatory burden. The indexes of freedom published by Freedom House include political rights and civil liberties. The indicators by the International Country Risk Guide (ICRG) comprise corruption in government, law and order tradition, and bureaucratic quality. Business Environmental Risk Intelligence (BERI) includes measures of bureaucratic delays, contract enforceability, nationalization risk, and policy stability. Finally, the World Competitiveness Yearbook (WCY) includes measures of bribing and corruption, tax evasion, public service exposed to political interference, and personal security and private property.

Property and contract rights are crucial to the investment response generated by changing relative product prices through trade reform (increasing the relative price of exportables to importables through the elimination of import quotas and the reduction of tariff rates) and by improving the allocation and availability of credit through financial reform (including interest-rate liberalization, the elimination of directed credit, bank privatization and the overhaul of bank regulation).

### 2.2. Social capital

Coleman (1988) is widely credited for introducing and formulating the concept of social capital. He defines social capital as "obligations and expectations, information channels, and social norms" (Coleman, 1988, p. S95). Coleman (1990, p. 304) defines social capital as "some aspect of social structure that enables the achievement of certain ends that would not be attainable in its absence". On the other hand, Putnam (1993, p. 167) defines social capital as "those features of social organization, such as networks of individuals or households, and the associated norms and values that create externalities for the community as a whole." Similarly, Fukuyama (1999, p. 16) argues that "[t]rust acts like a lubricant that makes any group or organization run more efficiently."

The role of social capital in economic activities is a recent but rapidly growing research area in economics. Indeed, citations of the term 'social capital' in the *EconLit* database were lower than 10 in the first half of the 1990s but expanded to 153 citations in 2000 (Isham et al., 2002). As of yet, there is no unique definition of 'social capital'. The terms that are usually used in the definition are cooperative norms (Coleman, 1988; Putnam, 1993, 2000; Knack and Keefer, 1997; Woolcock and Narayan, 2000), trust (Putnam, 1993; Knack and Keefer, 1997), and networks that allow people to act collectively (Putnam, 1993, 2000; Woolcock and Narayan, 2000; Sobel, 2002). However, most definitions include one or more of the concepts of networks, cooperative norms, trust, and associational activity (see Knowles, 2006).

In a recent paper in the *Journal of Economic Perspectives*, the sociologist Mark Granovetter presents an interesting discussion of the effects of social structure on economic outcomes. Although the author does not focus explicitly on social capital, he does analyze elements that are often associated with the concept of social capital. Granovetter argues that "social networks affect the flow and the quality of information. . .[S]ocial networks are an important source of reward and punishment. . .[T]rust emerges, if it does, in the context of a social network" (Granovetter, 2005, p. 33). The author also points out that social networks play a vital role in most labor markets, and that "employers and employees prefer to learn about each other from personal sources whose information they trust" (Granovetter, 2005, p. 36).

The empirical literature on social capital emphasizes networks, associational activity (Putnam, 1993) and trust (Knack and Keefer, 1997) as indicators of social capital. Putnam (1993) uses membership in groups and clubs as a measure of social capital and concludes that the Italian North developed faster than the Italian South because the North had higher social capital. Similarly, Guiso et al. (2004) study the effects of social capital (as defined in Putnam, 1993) on financial development in Italy and show that households located in regions where social capital is high (mainly Northern Italy) make less use of informal credit and more use of formal financial markets and tend to invest less in cash and more in stock. Moreover, they show that the effect of social capital is stronger among less educated people and in regions where legal enforcement is weaker. These findings suggest that social capital could substitute for institutions (and may also substitute for human capital) and underscore the importance of the interaction between social capital and institutions. Knack and Keefer (1997)

find strong association between trust, and civic norms and income but did not find evidence that membership in formal groups, and economic performance and trust are correlated. In addition, the authors show that trust and civic norms are stronger in countries with formal institutions that effectively protect contracts and property rights, suggesting that social capital and institutions could be complements.

It is generally agreed that a legal system that ensures contract enforcement enables the transition from personalized exchange to anonymous trade, which is an essential step in the process of development and long-term growth. A historical example of the role of a legal system that led to significant trade expansion is the Law Merchant in the 12th and 13th century. However, some historical evidence shows that social capital may lead to a similar outcome, as demonstrated by the networks developed by the Maghribi traders' coalition of the 11th century (Greif, 1993).

Trust has often been used as an indicator of social capital. For example, Knack and Keefer (1997), Whiteley (2000), Zak and Knack (2001), Calderón et al. (2001), and Dearmon and Grier (2009) all use the trust variable from World Values Survey[2] (WVS); while Beugelsdijk and van Schaik (2005) use data on trust from the European Values Studies. Knack and Keefer (1997) show that this indicator of trust is strongly correlated with income. Using cross-sectional data from 48 countries, over the period 1980–1994, Calderón et al. (2002) show that trust is correlated with financial depth and efficiency and with stock market development. Zak and Knack (2001) find that social capital in the form of trust promotes economic growth. Similarly, Whiteley (2000) finds that social capital has a positive influence on growth that is at least as strong as the influence of human capital. Using various ordinary least-squares (OLS) estimations and data on social capital from the 1990 European Values Studies, Beugelsdijk and van Schaik (2005) find that growth disparities in 54 European regions are positively related with associational activity, while the survey measure of trust ('generally speaking, would you say most people can be trusted, or that you cannot be too careful in dealing with people?') was not significant.

A key paper in the recent literature is Ahlerup et al. (2009) who examine the effects of institutions and social capital (proxied by interpersonal trust data from the World Value Survey) on economic growth and include a multiplicative interaction term for social capital and institutions. The authors show that the marginal effect of social capital decreases with institutional strength. The impact is such that a one standard deviation increase in social capital in Nigeria (a country with weak institutions) should raise economic growth by 1.8 percentage points, while the same increase in social capital only increases growth by 0.3 percentage points in Canada which has strong institutions.

Other studies have relied on experiments. Glaeser et al. (2000) conduct experiments (using 196 Harvard undergraduates) with monetary rewards, and a game based on Berg et al. (1995), where a participant (the sender) is asked to send money to his or her partner (the recipient). The experimenter doubles the amount sent and the recipient may return the money back to the sender. In this game, the amount of the money sent by the first player (the sender) is viewed as a natural measure of trust and the amount returned by the recipient as a measure of trustworthiness. A second experiment consisted of asking the subject to place a value on an envelope (addressed to

the subject and containing 10 dollars) that an experimenter will drop in a public area. The subject places a value on each location and condition of the envelop (for example, stamped and sealed). Combining the results of the two games with a 137-question survey, half of which includes attitudinal and self-reported behavioral measures of respondents' trustworthiness and trustfulness, Glaeser and his co-authors identify two attitudinal questions[3] about trusting strangers that predict trust in both experiments. On the other hand, none of the ten variants of broad attitudinal questions used in the model had a significant association with trusting choices. This underscores potential weaknesses of the WVS trust variable as a measure of generalized trust.

Anderson et al. (2004) conduct public-goods experiments using a group of 48 undergraduate students at the College of William and Mary where students had to allocate a certain amount of money (tokens) to a public account. Following the experiment students fill out a 42 question survey based on which (and on the contributions made to the public account) the authors derive relevant relationships. The main finding is that generalized trust (trusting strangers) turns out to be the most significant determinant of contributions to the group account. In contrast to the findings in Glaeser et al. (2000), Anderson et al. (2004) state that the most common attitudinal measure of trust used in the literature which is based on the affirmative responses to the question 'do you think most people can be trusted?' is also statistically significant, although its effect is much weaker relative to the effect of generalized trust. However, it is worth noting that the wording of the Anderson et al. trust question seems very similar to the generalized trust question.

The existing literature reports ambiguous results regarding the direction of causality. Most studies maintain that a higher level of social capital contributes positively to economic development and growth. However, some studies show that causality may run from economic growth to social capital and the effect could be negative. For example, at least two studies (Cribb and Brown, 1995; Miguel et al., 2002) show that economic development caused social capital in Indonesia to weaken through the effects that development had on mobility and urbanization.

### 2.3. Brief review of research on social capital in Africa

Recent studies that use macro-level data to explore the effects of social capital in Africa include Addison and Baliamoune-Lutz (2004), and Baliamoune-Lutz (2009a).[4] In the latter, the author views low (or lack of) corruption and social cohesion as indicators (proxies) of the level of trust in African countries and shows that the interaction between good institutions and high social capital has a positive influence on human well-being measured by adult literacy rates. This suggests that social capital and institutions in Africa may be complements. Addison and Baliamoune-Lutz (2004) use property rights as a proxy for social capital and explore the role of social capital in post-conflict reconstruction in Africa. The authors find that "social capital plays an important role in post-conflict reconstruction. . . treaties and human misery (measured as the number of dead) have only short-term effects while social capital, economic development, and war type are more significant in the long-run" (Addison and Baliamoune-Lutz, 2004, p. 18).

In contrast to the finding in Knack and Keefer (1997), Baliamoune-Lutz and Lutz (2004), and Baliamoune-Lutz (2009a)

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[2] WVS summarizes answers to the question "generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?" The two answer categories are "most people can be trusted" and "can't be too careful". This measure of trust has been criticized in several studies (see for example, Glaeser et al., 2000). Perhaps more importantly for the purpose of this paper, WVS data are not available for most African countries.

[3] These two attitudinal survey questions are (1) 'you can't trust strangers anymore' and (2) 'when dealing with strangers, one is better off using caution before trusting them'.

[4] Baliamoune-Lutz and Mavrotas (2009) and Baliamoune-Lutz (2009b) examine the effect of social capital and social cohesion on aid effectiveness in African countries.

that institutions and social capital could be complements, weak institutions could actually give rise to the creation and strengthening of social capital, so that institutions and social capital could be substitutes. For example, using micro-level data to examine the behavior of grain traders in Ethiopia after the 1990 reform, Gabre-Madhin (2001) reports that "[w]eak public market information, the lack of grain standardization, the oral nature of contracts, and limited legal enforcement of contracts increase the risk of commitment failure. In response, traders either choose partners they know well or engage a broker. The presence of brokers facilitates anonymous exchange between traders." Gabre-Madhin also finds that grain traders in Ethiopia continue to depend on personalized trade for most of their transactions, including those in distant markets.

Minten and Fafchamps (2002) find that agricultural traders in Madagascar "rank the importance of relationships for success in business higher than input prices, output prices, and access to credit or equipment." Furthermore, the authors show that social capital enables traders to reduce search and information costs, and substitutes for weak market institutions. In another study, Fafchamps and Minten (2001) show that in Benin, Malawi, and Madagascar those individual traders who have more contacts have higher output. The presence of high transaction costs in many parts of Africa causes markets to become thin and prevents the development of long-term business commitments and forward contracting. For example, due to high transaction costs, grain traders in Madagascar do not enter (or enter very few) forward contracts (Fafchamps and Minten, 2001).

Finally, ethnicity-based social capital has also been the subject of empirical investigation. Fafchamps (2000) finds an ethnic and gender bias in the attribution of supplier credit to manufacturing firms in Kenya and Zimbabwe, and argues that the network effect has a major role in explaining the bias. However, using data from Benin, Madagascar and Malawi, Fafchamps (2003) finds that agricultural trade is fairly open to all, irrespective of gender, ethnicity, or religion, but he reports that network effects significantly affect trust and information sharing. It is important to note that some studies have pointed out that not all types of social capital are good for economic performance (see for example Portes, 1995; Woolcock, 1998).

## 3. Data and methodology

We empirically examine the effects of institutions and trust-based social capital on income while controlling for two other major determinants of economic development, human capital and trade, based on the following general model:

$$income = f(human\_capital, openness, institutions, social\_capital) \quad (1)$$

The variables included on the right-hand side are indicators of institutional quality, human capital, openness to international trade, and social capital. We also include a term reflecting the interaction between social capital and institutions. A description of the variables and data sources is shown in Appendix A. The dependent variable is the purchasing-power-parity adjusted value of per-capita income in log form. The indicator of human capital used in this study is adult literacy. We use the ratio of imports and exports to gross domestic product (GDP) as a measure of openness to international trade. Data on these variables are from World Development Indicators Database (World Bank, 2005). We use civil liberties[5] (from Freedom House) and the 'polity 2' variable from the Polity IV project as alternate indicators of institutional quality. The variable 'civil liberties' was used by Kormendi and Meguire (1985),

and subsequently by others, as an indicator of institutions. Similarly, polity has been used in influential work on institutions and growth (see Glaeser et al., 2004). We also try to examine the effect of property rights (Gwartney et al., 2004). Unless noted differently, the data are from the period 1975–2001.

Finally, we use a variable that reflects generalized trust as an indicator of social capital. We believe trust is a good measure of the stock of social capital and can capture the positive aspects of social capital resulting from networks and cooperation. Knowles (2006) points out that "[i]t seems likely that trust and cooperation will be built up by repeated interactions with others; hence networks and associational memberships can be seen as a source of trust and cooperation" (Knowles, 2006, p. 3). On the other hand, Woolcock (2001) argues that social capital is a consequence of trust. In either case, it seems that trust could serve as an adequate indicator of social capital since the issue here is not whether social capital causes trust or the other way around.

Granovetter (2005) discusses the effects of thick trust or strong ties on trade and points out that sellers may offer friends and relatives lower prices than they could get from strangers and that may lead to fragmented markets (Granovetter, 2005, pp. 38–41; see also Granovetter, 1973). On the other hand, generalized trust or weak ties may serve to expand markets. The measure of trust that is of interest to the purpose of this study is one that reflects generalized trust (weak ties, thin or bridging trust). Such indicator should reflect trust in strangers and not be limited to trusting friends and family members. We view contract-intensive money (CIM) as an indicator that has such characteristics. This variable was used by Clague et al. (1999) as a measure of enforceability of contracts and the security of property rights which are also thought to be trust enhancing. However, as we will show, CIM is not a good proxy for property rights (at least in developing countries), as it turns out to be for the most part uncorrelated with property rights. CIM reflects the extent of generalized trust both with regard to a spatial dimension – trusting a large number of individuals and more importantly trusting those one does not necessarily know – and a dimension of time, since agents enter into a transaction in the present and receive income or collect payoffs in the future. Thus, transactions involving CIM are trust-sensitive transactions (Knack and Keefer, 1997).

Table 1 is adapted from Knack and Keefer (1997) where the authors use data from the 1990–1993 WVS for the group of countries shown in the table to study the effect of social capital on economic performance. Knack and Keefer find that civic norms and trust are highly and positively correlated with institutional quality (restraint of predatory actions of chief executives), human capital, and ethnic homogeneity; and negatively correlated with income inequality. The numbers in Table 1 indicate that, in general, countries that have high levels of trust (as measured by WVS) also have high levels of civic cooperation (CIVIC). But this is not necessarily the case in the reverse direction as several countries with high civic cooperation have low levels of trust (for example, Turkey and Italy). In addition, the variable 'GROUPS', which represents the density of associational activity in the country (Knack and Keefer, 1997), does not appear to be highly correlated with trust or civic cooperation. Knack and Keefer also distinguish between groups that tend to have redistributive goals (rent-seeking), which they labeled "Olsonian" groups (O-GROUPS) in reference to Olson (1982) and associations that do not act as rent-seeking organizations, which they refer to as "Putnam-esque" groups (P-GROUPS) in reference to Putnam (1993). Knack and Keefer include in the P-groups religious and church organizations, education, arts, and cultural activities, and youth association such as scouts and youth clubs. The O-groups, which may have no effects or even negative effects on economic performance or welfare, consist of trade unions, political parties, and professional association. The numbers associated with these

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[5] The index of civil liberties has been inverted so that higher values mean better institutional quality.

**Table 1**
Social capital indicators for selected countries[a].

| | Trust | Civic | Groups | O-Groups | P-Groups | Confidence in government | Ethnic homogeneity | CIM 1980 | CIM 1994 | CIM 2001 |
|---|---|---|---|---|---|---|---|---|---|---|
| Norway | 61.2 | 40.75 | 1.09 | 0.24 | 0.63 | 0.72 | 98 | 0.88 | 0.92 | 0.95 |
| Finland | 57.2 | 40.64 | 0.4 | 0.06 | 0.29 | 0.66 | 90 | | | |
| Sweden | 57.1 | 41.57 | 1.08 | 0.27 | 0.64 | 0.65 | 88 | 0.87 | 0.91 | 0.91 |
| Denmark | 56.0 | 40.34 | 0.97 | 0.24 | 0.61 | 0.76 | 95 | 0.93 | 0.95 | 0.94 |
| Canada | 49.6 | 39.74 | 1.03 | 0.52 | 0.29 | 0.7 | 70 | 0.93 | 0.94 | 0.95 |
| Australia | 47.8 | 38.27 | 1.01 | 0.45 | 0.35 | 0.64 | 98 | 0.91 | 0.93 | 0.94 |
| Netherlands | 46.2 | 38.36 | 1.11 | 0.53 | 0.25 | 0.63 | 99 | | | |
| U.S. | 45.4 | 40.55 | 1.5 | 0.83 | 0.42 | 0.41 | 81 | 0.93 | 0.91 | 0.91 |
| U.K. | 44.4 | 40.07 | 0.92 | 0.38 | 0.36 | 0.54 | 82 | 0.86 | 0.95 | 0.98 |
| Switzerland | 43.2 | 40.89 | 0.73 | 0.22 | 0.29 | | 72 | 0.86 | 0.93 | 0.92 |
| Iceland | 41.6 | 41.07 | 1.7 | 0.63 | 0.76 | 0.73 | 100 | 0.94 | 0.97 | 0.98 |
| Japan | 40.8 | 41.79 | 0.38 | 0.14 | 0.21 | 0.46 | 99 | 0.92 | 0.92 | 0.90 |
| Ireland | 40.2 | 37.51 | 0.85 | 0.48 | 0.24 | 0.73 | 94 | | | |
| South Korea | 38.0 | 39.64 | 0.47 | 0.31 | 0.12 | 0.61 | 100 | 0.85 | 0.90 | 0.96 |
| Spain | 34.5 | 38.75 | 0.45 | 0.23 | 0.14 | 0.55 | 75 | | | |
| India | 34.3 | 42.65 | | | | 0.67 | 72 | 0.75 | 0.80 | 0.83 |
| Austria | 31.8 | 41.45 | 0.76 | 0.26 | 0.37 | 0.6 | 99 | | | |
| South Africa | 30.5 | 36.99 | 0.84 | 0.52 | 0.16 | 0.7 | 73 | 0.95 | 0.95 | 0.96 |
| Belgium | 30.2 | 38.08 | 56 | 0.26 | 0.2 | 0.6 | 57 | | | |
| Germany | 29.8 | 39.83 | 0.74 | 0.22 | 0.35 | 0.54 | 99 | | | |
| Argentina | 27.0 | 39.5 | 0.47 | 0.19 | 0.21 | 0.28 | 91 | 0.82 | 0.79 | 0.88 |
| Italy | 26.3 | 41.23 | 0.38 | 0.12 | 0.2 | 0.44 | 99 | | | |
| France | 24.8 | 36.26 | 0.42 | 0.16 | 0.18 | 0.62 | 94 | | | |
| Nigeria | 22.9 | 39.19 | | | | 0.73 | 32 | 0.78 | 0.66 | 0.74 |
| Chile | 22.7 | 36.8 | 0.59 | 0.33 | 0.14 | 0.64 | 78 | 0.88 | 0.92 | 0.93 |
| Portugal | 21.4 | 36.89 | 0.43 | 0.21 | 0.14 | 0.45 | 99 | | | |
| Mexico | 17.7 | 34.55 | 0.57 | 0.28 | 0.14 | 0.53 | 58 | 0.86 | 0.88 | 0.88 |
| Turkey | 10.0 | 42.43 | | | | 0.61 | 82 | 0.77 | 0.92 | 0.96 |
| Brazil | 6.7 | 37.58 | 0.68 | 0.31 | 0.16 | 0.55 | 88 | 0.86 | 0.93 | 0.89 |

[a] Adapted from Knack and Keefer (1997, p. 1285) and augmented with data on CIM.

groups indicate that, indeed, P-groups seem to be positively associated with trust and civic cooperation. Knack and Keefer (1997) did not find conclusive evidence on the effect of P-groups and O-groups on growth or investment.

In the last three columns of Table 1 we augment the table by including contract-intensive money. Three reference dates are used, 1980, 1994, and 2001. Obviously, the choice of these periods is subjective but it is not necessarily arbitrary. We included values for CIM from 11 to 14 years before the WVS data were collected (1990–1993); CIM data in 1994, the year after the survey data were collected; and data on CIM 7–8 years after the surveys were done. We should note that if CIM is a good indicator of social capital, then the effect of time should be smaller for shorter periods of time, and larger (though not necessarily very large) for longer periods, since social capital tends to change slowly over time (Glaeser et al., 2004; Knowles, 2006). A quick examination of the numbers in the last three columns of Table 1 reveals that large changes in CIM, although they exist, are not very common. The only countries with relatively significant changes are Turkey, Nigeria, and Argentina. Turkey experienced an increase in the CIM ratio of about 19.5%

over the period 1980-1994. In Nigeria CIM fell from 0.78 in 1980 to 0.66 in 1994 (a decline of more than 15% over a period of 14 years), and increased to 0.74 in 2001 (an increase of 12% over 7 years). Argentina had a significant increase in CIM (about 11%) in the period 1994–2001. In general, there seems to be a statistically significant positive correlation between CIM and at least two WVS indicators of social capital, trust and civic norms. However, the correlation between CIM and trust does not seem to be high.

The correlation coefficients in Table 2 show that of the three measures of CIM, the one measured in 1980 has the highest association (0.49) with the variable TRUST. However, we must point out that this correlation is much weaker or negative when we focus only on developing countries. It turns out that the linear correlation between the variable trust and CIM 1980, CIM 1994 and CIM 2001 in developing countries (including South Korea) is 0.06, −0.21 and 0.001, respectively. This seems to be consistent with the findings in Holm and Danielson (2005) who report that the predictive power of survey trust questions (such as the one we included in Table 1) differ between Sweden and Tanzania in the sense that a plausible relationship between survey trust and trust behavior was found in

**Table 2**
Correlation matrix using data from Table 1.

| | CIM 1980 | CIM 1994 | CIM 2001 | Trust | Civic | Groups | O-Groups | P-Groups | Confidence in government |
|---|---|---|---|---|---|---|---|---|---|
| CIM 1994 | 0.6863 | | | | | | | | |
| CIM 2001 | 0.5803 | 0.9145 | | | | | | | |
| Trust | 0.4899 | 0.3158 | 0.3326 | | | | | | |
| Civic | −0.2348 | −0.0069 | 0.0428 | 0.3874 | | | | | |
| Groups | 0.5941 | 0.4903 | 0.4816 | −0.0929 | −0.1101 | | | | |
| O-Groups | 0.6273 | 0.3594 | 0.3948 | 0.1655 | −0.0665 | −0.0471 | | | |
| P-Groups | 0.3562 | 0.3628 | 0.3727 | 0.6638 | 0.5889 | −0.0929 | 0.2595 | | |
| Confidence in government | 0.0929 | 0.1273 | 0.0992 | 0.3536 | 0.0231 | 0.0311 | 0.2000 | 0.4167 | |
| Ethnic homogeneity | 0.4104 | 0.6332 | 0.6745 | 0.2718 | 0.2149 | −0.4705 | −0.1201 | 0.3017 | −0.1711 |

*Source:* Data on CIM are from the *International Financial Statistics* database (IMF, 2005). All other data are from Knack and Keefer (1997, p. 1285).

Sweden but not in Tanzania. In this paper, CIM is meant to reflect trust behavior.

In addition, CIM seems to have no association with civic cooperation and in one case shows negative but weak correlation. On the other hand, CIM has a positive association with the measure of membership in groups (GROUPS) and with ethnic homogeneity. WVS data suggest that countries with high ethnic homogeneity tend to have high levels of trust and civic cooperation. We find the highest correlation (0.67) between CIM and ethnic homogeneity when we use CIM from 2001. This suggests that ethnic homogeneity may cause trust (social capital); i.e., that generalized trust is higher in ethnically homogeneous societies.

Finally, it is very important to emphasize the lack of association between CIM and 'confidence in government' while P-GROUPS and, to a lesser extent, TRUST are correlated with confidence in the government. This suggests that CIM may not necessarily be responsive to institutional reforms and governance, and well defined property rights, as it may reflect how individuals interpret those reforms and changes given the norms, social structures and social interaction prevailing in their society, and a host of other factors (such as culture and religion) not just political and economic factors. Thus, CIM fulfills an important assumption for a good indicator of social capital based on generalized trust; it does not necessarily represent the effect of institutional quality or property rights, two indicators that would inspire (be correlated with) confidence in government.

Table 3 displays correlations among relevant variables based on data from 39 African countries (including North Africa). These data are also used to empirically study the effects of social capital (in the form of generalized trust) and institutions on development in Africa. While recognizing that there is a host of other indicators of development we use per-capita income as the main indicator of development for two reasons. First, most development indicators are strongly correlated with income. Second, the availability of data restricts the degree of choice of alternate indicators. The results reported in Table 3 indicate that most variables have statistically significant (and with anticipated signs) correlation coefficients. One exception is the variable *propr* (property rights), which has a weak correlation (significant at the 10-percent level) with income and a negative correlation or no correlation with all other variables. It is important to point out that there is positive and statistically significant correlation between income and literacy, indicators of institutional quality (civil liberties and polity), our measure of trust (*cim*) and the interaction of the variable *cim* with institutions.

## 4. Panel estimation

Table 4 displays fixed-effects estimation results for eight different specifications. We use the Hausman test to determine whether the random-effects estimator is valid. In all specifications the validity of the random-effects estimator is rejected. Thus, we report and focus the analysis on the fixed-effects equations.

Eq. (1) estimates the basic model where the right-hand-side (RHS) includes the variables *cim*, literacy, and openness. There are positive and highly significant coefficients on the indicator of human capital (literacy) and the indicator of social capital (*cim*). On the other hand, the coefficient on openness to international trade is negative and statistically significant (at the 5-percent level). Eq. (2) adds property rights (*propr*) to the RHS of the equation. The results show that the coefficients on the indicators of social capital and human capital remain significant and still have positive signs. Interestingly, the coefficient on openness is now positive and statistically significant. The coefficient on property rights has a negative sign and is insignificant. In Eq. (3) we remove the variable *cim* to explore whether the effect of social capital on income reflects the effect of property rights (although the correlation between these

**Table 3**
Correlation matrix using 1975–2001 data from Africa (39 countries).

| | income | literacy | lagcim | literacy × lagcim | civil lib | civil lib × lagcim | propr | propr × cim | cim | open | civ lib × cim | polity | polity × lagcim |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| literacy | 0.578 [0.00] | | | | | | | | | | | | |
| lagcim | 0.367 [0.00] | 0.465 [0.00] | | | | | | | | | | | |
| literacy × lagcim | 0.5922 [0.00] | 0.937 [0.00] | 0.709 [0.00] | | | | | | | | | | |
| civil lib | 0.335 [0.00] | 0.259 [0.00] | 0.244 [0.00] | 0.285 [0.00] | | | | | | | | | |
| civil lib × lagcim | 0.429 [0.00] | 0.391 [0.00] | 0.595 [0.00] | 0.531 [0.00] | 0.913 [0.00] | | | | | | | | |
| propr | 0.119 [0.05] | −0.130 [0.04] | −0.165 [0.00] | −0.1810 [0.00] | −0.073 [0.24] | 0.0144 [0.81] | | | | | | | |
| propr × cim | 0.312 [0.00] | 0.064 [0.33] | 0.258 [0.00] | 0.137 [0.04] | 0.179 [0.00] | 0.121 [0.05] | 0.828 [0.00] | | | | | | |
| cim | 0.411 [0.00] | 0.559 [0.00] | 0.739 [0.00] | 0.716 [0.00] | 0.501 [0.000] | 0.236 [0.00] | −0.254 [0.00] | 0.246 [0.00] | | | | | |
| openness | 0.372 [0.00] | 0.377 [0.00] | 0.331 [0.00] | 0.408 [0.00] | 0.334 [0.00] | 0.246 [0.00] | 0.031 [0.62] | 0.141 [0.02] | 0.396 [0.00] | | | | |
| civil lib × cim | 0.458 [0.00] | 0.433 [0.00] | 0.491 [0.00] | 0.529 [0.00] | 0.955 [0.00] | 0.902 [0.00] | −0.104 [0.09] | 0.191 [0.00] | 0.604 [0.00] | 0.357 [0.00] | | | |
| polity | 0.255 [0.00] | 0.296 [0.00] | 0.133 [0.00] | 0.275 [0.00] | 0.638 [0.00] | 0.729 [0.00] | 0.010 [0.87] | 0.029 [0.63] | 0.115 [0.00] | 0.106 [0.00] | 0.630 [0.00] | | |
| polity × lagcim | 0.224 [0.00] | 0.231 [0.00] | 0.031 [0.32] | 0.217 [0.00] | 0.612 [0.00] | 0.719 [0.00] | 0.004 [0.95] | 0.033 [0.60] | 0.076 [0.16] | 0.052 [0.11] | 0.628 [0.00] | 0.974 [0.00] | |
| polity × cim | 0.234 [0.00] | 0.228 [0.00] | 0.078 [0.02] | 0.223 [0.00] | 0.617 [0.00] | 0.713 [0.00] | 0.013 [0.83] | 0.051 [0.42] | 0.044 [0.16] | 0.033 [0.29] | 0.612 [0.00] | 0.975 [0.00] | 0.975 [0.00] |

Source and variable definition: see Appendix A. *P*-values are in brackets.

**Table 4**
Income, civil liberties and social capital: fixed-effects estimates. Dependent variable: *income* (log of per-capita income, PPP).

| | (1) | (2) | (3) | (4) | (5)[b] | (6)[b] | (7)[c] | (8)[c] |
|---|---|---|---|---|---|---|---|---|
| cim | 1.017*** (0.109) | 0.410** (0.183) | | 1.022*** (0.109) | −2.943*** (0.491) | −2.694*** (0.489) | −1.908*** (0.411) | −1.172*** (0.409) |
| literacy | 0.0334*** (0.0008) | 0.0096** (0.003) | 0.009* (0.003) | 0.033*** (0.0008) | 0.032*** (0.008) | 0.032*** (0.008) | 0.034*** (0.0009) | 0.035*** (0.0009) |
| openness | −0.104** (0.051) | 0.287*** (0.090) | 0.243*** (0.086) | −0.101** (0.050) | −0.088** (0.047) | −0.082* (0.047) | −0.087* (0.056) | −0.085 (0.055) |
| propr | | −0.093 (0.072) | −0.093 (0.073) | | | | | |
| cim.squared | | | | | 2.310*** (0.383) | 2.269*** (0.379) | 0.632*** (0.307) | 0.680** (0.304) |
| civil lib | | | | 0.312*** (0.109) | −3.394*** (0.476) | −4.889*** (0.573) | −4.775*** (0.578) | −6.218*** (0.124) |
| civil lib × cim | | | | | 4.920*** (0.619) | 4.003*** (0.644) | 6.436*** (0.736) | 5.069*** (0.795) |
| civil lib.squared | | | | | | 3.563*** (0.781) | | 4.074*** (0.947) |
| constant | 4.802*** (0.081) | 6.345*** (0.271) | 6.668* (0.232) | 4.751*** (0.083) | 6.424*** (0.186) | 6.525*** (0.185) | 6.515*** (0.169) | 6.642*** (0.171) |
| No. of obs. | 921 | 231 | 236 | 921 | 921 | 921 | 898 | 898 |
| R-Squared | | | | | | | | |
| Within | 0.690 | 0.134 | 0.108 | 0.701 | 0.734 | 0.740 | 0.671 | 0.678 |
| Between | 0.273 | 0.315 | 0.281 | 0.282 | 0.295 | 0.298 | 0.282 | 0.285 |
| Overall | 0.342 | 0.309 | 0.272 | 0.352 | 0.372 | 0.374 | 0.348 | 0.350 |
| Hausman test[a] prob> $\chi^2$ in [] | 49.08 [0.000] | 25.74 [0.000] | 17.99 [0.000] | 76.55 [0.000] | 57.85 [0.000] | 53.71 [0.000] | 21.05 [0.001] | 18.67 [0.009] |

Standard errors are in parentheses.
* Significance at 0.10.
** Significance at 0.05.
*** Significance at 0.01.
[a] Ho: difference in coefficients not systematic.
[b] We estimated the same equation including the interaction between *propr* and *cim* but this did not improve the estimation and the coefficient on this term was statistically insignificant.
[c] This specification includes the fifth lag of the variable *cim* instead of *cim*.

two variables is not high) instead of being an independent effect. The results indicate that even after removing *cim*, property rights remain statistically non-significant and with a negative sign. The inclusion of property rights reduces the sample from 921 to 231 observations. In Eq. (4) we drop the variable *propr* and include civil liberties as indicator of institutional quality.[6] The coefficient on civil liberties is positive and significant at the 1-percent level but the coefficient on openness is again negative.

In Eqs. (5) and (6) we assess the significance of the joint effect of institutions and social capital (*civil lib × cim*). We also explore the possibility of a non-monotonic relationship between income and *cim* and civil liberties. The results indicate that there is a U relationship between generalized trust (proxied by CIM) and income per-capita. It seems that at low levels of trust, increases in trust may affect economic performance negatively and hence lower income. However, the effects become positive at high levels of trust. This finding is consistent with the distinction between thick trust and thin trust and their effects on economic performance. It is plausible that at low levels of generalized trust may reflect predominance of thick trust (bonding social capital) that may lead to rent seeking activities and impact economic performance negatively. As trust increases beyond the boundaries of small units, tribes or clans it becomes generalized trust (bridging social capital) that is expected to have a positive influence on economic performance. Moreover, the results show that the joint effect of social capital and institutions is positive. Interestingly, the coefficient on civil liberties is statistically significant and negative. However, both the coefficient on the square of civil liberties (suggesting a U relationship between institutions and income) and the one on the interaction between social capital and civil liberties (*civil lib × cim*) are positive and highly significant. This result suggests that success of institutional reform may be enhanced if there is a high level of generalized trust (social capital).

Assuming a country is at the sample mean of institutional quality (index of civil liberties of 4.6) and using the results in column 6 (Table 4), the turning point (point at which the effect becomes positive) occurs at CIM value of 0.40. In 2001, only three countries (Chad, Central African Republic, and Guinea Bissau) had an index for civil liberties higher (worse) than 4.6 and were still below the social capital turning point (to benefit from a positive impact). This suggests that in these countries an improvement in institutional quality may have a strong effect on income only at a much improved level of social capital. The turning point using the results in Table 5 (column 4) and the sample mean for polity (−3.3), is at a CIM value of 0.397 which is almost the same as the one derived using civil liberties.

In order to minimize the issues associated with possible endogeneity of trust, we substitute a lagged value (5 year lag) of CIM for contemporaneous CIM and present the results in columns (7) and (8) of Table 4. This variable appears in the *cim* row in Eqs. (7) and (8), and is also used in the interaction terms. Again, we find that social capital and institutions have U-relationships with income and the joint effect of social capital and institutions is positive and statistically significant at the 1-percent level. Given that these estimations use the value of *cim* five years earlier, the problem of endogeneity is significantly reduced (if not eliminated). Thus, the results in Eqs. (7) and (8) are qualitatively similar to those in the previous equations.

In Table 5, we report fixed-effects estimates of equations using a different measure of institutional quality. Instead of civil liberties we use the Polity 2 variable (*polity*) from the Polity IV project. Since the components of polity could affect the effectiveness of openness to trade (see Baliamoune-Lutz and Ndikumana, 2007) we

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[6] We have also used political rights instead of civil liberties and the results (not shown) are similar to those reported in Table 4.

**Table 5**
Income, polity and social capital: fixed-effects estimates. Dependent variable: *income* (log of per-capita income, PPP).

| | (1) | (2) | (3) | (4) | (5)[b] |
|---|---|---|---|---|---|
| *cim* | 1.000*** (0.109) | 0.972*** (0.104) | −1.857*** (0.474) | −2.405*** (0.474) | −0.665* (0.386) |
| *literacy* | 0.0343*** (0.0009) | 0.038*** (0.0009) | 0.036*** (0.0009) | 0.036*** (0.0009) | 0.039*** (0.001) |
| *openness* | −0.109** (0.050) | −0.082* (0.049) | −0.066 (0.048) | −0.087* (0.048) | −0.077 (0.047) |
| *polity* | −0.0041** (0.001) | −0.012*** (0.003) | −0.011*** (0.003) | −0.043*** (0.006) | −0.055*** (0.007) |
| *polity*_squared | | 0.003*** (0.0004) | 0.003*** (0.0003) | 0.003*** (0.0003) | 0.003*** (0.0004) |
| *cim*_squared | | | 2.311*** (0.378) | 2.806*** (0.381) | 0.913*** (0.286) |
| *openness* × *polity* | | 0.018*** (0.004) | 0.017*** (0.004) | 0.008* (0.004) | 0.010*** (0.004) |
| *polity* × *cim* | | | | 0.053*** (0.008) | 0.061*** (0.009) |
| *constant* | 4.759*** (0.082) | 4.472*** (0.084) | 5.324*** (0.162) | 5.467*** (0.161) | 5.041*** (0.142) |
| No. of obs. | 921 | 921 | 921 | 921 | 898 |
| *R*-Squared | | | | | |
| Within | 0.701 | 0.730 | 0.741 | 0.751 | 0.705 |
| Between | 0.267 | 0.294 | 0.304 | 0.308 | 0.297 |
| Overall | 0.337 | 0.353 | 0.366 | 0.373 | 0.350 |
| Hausman test [a] prob > $\chi^2$ in [] | 46.57 [0.000] | 1434.85 [0.000] | 85.41 [0.000] | 75.78 [0.000] | 36.77 [0.000] |

Standard errors are in parentheses.

* Significance at 0.10.
** Significance at 0.05.
*** Significance at 0.01.
[a] Ho: difference in coefficients not systematic.
[b] This specification includes the fifth lag of the variable *cim* instead of *cim*.

also include the interaction between trade openness and institutional quality. Interestingly, whereas the coefficient on openness to trade has a negative sign (and is marginally significant in Eqs. (2) and (4)) the joint effect of polity and trade openness is positive and significant. This is in line with the conclusion from the the oretical model in Levchenko (2007) that institutional differences may constitute a source of comparative advantage and with the finding in Addison and Baliamoune-Lutz (2006), and Baliamoune-Lutz and Ndikumana (2007) that improved institutional quality enhances the growth effects of trade in Africa. The other results are qualitatively similar to those reported in Table 4. In particular, there is strong evidence of a U relationship between social capital and income, and between institutions and income. In addition, we again find a positive joint effect of social capital and institutions on income.

Assuming the same level of openness to trade, a country with a polity value of 6, for example, and high value for CIM in 2001, such as Lesotho (CIM value equals 0.93) will have a significantly higher contribution to income from institutional quality compared to a country with the same value of polity but a lower value for CIM such as Ghana (CIM value equals 0.69). Using the coefficients in Table 5 (column 4) we find that the contribution to income in Lesotho is $433 dollars while in Ghana it is only $240.

To further test the robustness of the results we estimate Arellano–Bond GMM equations and report the results in Tables 6 and 7. We treat the variables *cim*, openness to trade, literacy, and institutional quality (civil liberties and polity), as well as their interactions as endogenous. Arellano–Bond panel estimation allows us to control for potential bias due to possible endogeneity of these regressors and the lagged dependent variable.

The estimates in Table 6 use civil liberties as indicator of institutional quality. The results indicate that social capital has a positive impact on income even after controlling for endogeneity. The square form of institutional quality is positive and significant at the 10-percent level, suggesting that the effectiveness of institutions may require threshold level of institutional quality. However, human capital (literacy) has a negative and statistically significant coefficient.

Table 7 displays estimates using the variable 'polity' as indicator of institutional quality. The results are in general consistent with those reported in Table 5 except for the coefficient on literacy, which is negative. We again find a U-shaped effect of social capital on income. However, the positive effect of polity on income

seems to be linear. Interestingly, the results indicate that social capital enhances the effectiveness of institutions and the impact of the joint effect of polity and social capital on income is non-linear. This is a very robust result, at least when we use polity as an indicator of institutional quality.

In the last column in Tables 6 and 7 we include the interaction between the square of institutions and the variable *cim*, to test whether social capital (trust) becomes irrelevant when institutional quality is very high. In other words, we test whether social capital and institutions become substitutes. The results indicate that when we use civil liberties, the joint effect of social capital and the squared form of institutions is positive and significant at the 5-percent level, with the coefficient on the term *cim* × civil liberties negative but non-significant. This indicates that civil liberties and social capital in the form of trust remain complements even at high levels of liberties. On the other hand, when we use the variable polity (column 6 of Table 7) the joint effect of the square of polity and *cim* is statistically insignificant, while the joint effect of the square form of *cim* and polity on income remains positive and statistically significant. This reinforces the earlier finding that trust-based social capital has a positive influence on political institutions but this effect occurs only once a threshold level of social capital is reached.

The result associated with human capital is puzzling given the existing evidence from the endogenous growth literature on the important role of human capital. Baliamoune-Lutz and Ndikumana (2007) who find a similar result argue that "in the case of African countries, the result could simply be an illustration of the fact that growth, which has been largely resource-led (especially oil), has often occurred in countries with very low levels of human capital." It would, thus, be interesting to explore whether social capital has an impact on the development effects of human capital.

Whiteley (2000) shows that human capital and social capital (in the form of trust) have strong positive effects on growth but did not examine the interaction between social capital and human capital. Both human capital and social capital (in the form of trust) can influence development through several channels, and particularly through innovation. While there is an extensive empirical literature in economics on the role of human capital in development via its effects on innovation, studies on the role of social capital in innovation are rather limited. Social capital in the form of trust can reduce the need for rigid control systems and thus may have an important positive impact on innovation (Quin, 1979).

**Table 6**
Income, social capital, and civil liberties: Arellano–Bond GMM estimates. Dependent variable: *income* (log of per-capita income, PPP).

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| *lagged income* | 0.715*** (0.038) | 0.716*** (0.038) | 0.717*** (0.037) | 0.715*** (0.037) | 0.714*** (0.037) | 0.716*** (0.038) | 0.706*** (0.038) |
| *cim* | 0.129** (0.055) | 0.150* (0.090) | 0.211** (0.090) | 0.233** (0.090) | 0.234** (0.098) | 0.216** (0.100) | 0.332*** (0.100) |
| *literacy* | −0.006*** (0.001) | −0.006*** (0.002) | −0.007*** (0.001) | −0.007*** (0.002) | −0.007*** (0.002) | −0.007*** (0.002) | −0.007*** (0.002) |
| *openness* | 0.107*** (0.024) | 0.099*** (0.024) | 0.113*** (0.023) | 0.114*** (0.023) | 0.114*** (0.023) | 0.116*** (0.023) | 0.109*** (0.024) |
| *civil lib* | −0.056 (0.054) | 0.036 (0.259) | −0.188 (0.295) | 0.086 (0.490) | 0.076 (0.490) | 0.064 (0.491) | 0.435 (0.491) |
| *civil lib × cim* | | −0.115 (0.335) | −0.417 (0.348) | −0.161 (0.134) | −1.113 (1.136) | −1.238 (1.141) | −1.525 (1.165) |
| *civil lib_squared* | | | 0.735* (0.389) | 0.707* (0.390) | 0.696* (0.391) | 0.738* (0.394) | |
| *civil lib × cim_squared* | | | | 0.521 (0.757) | 0.497 (0.758) | 0.638 (0.776) | 0.316 (0.776) |
| *civil lib_squared × cim* | | | | | | | 1.020** (0.516) |
| North | | | | | 0.001 (0.001) | | |
| South | | | | | | −0.001 (0.001) | −0.001 (0.001) |
| *constant* | 0.009*** (0.002) | 0.009*** (0.002) | 0.010*** (0.002) | 0.009*** (0.002) | 0.010*** (0.002) | 0.009*** (0.001) | 0.010*** (0.002) |
| Wald test-$\chi^2$ | 1694.16 | 1654.64 | 1867.47 | 1878.08 | 1878.57 | 1873.43 | 1775.07 |
| Sargan test[a], $\chi^2$ [prob > $\chi^2$] | 747.21 [0.28] | 744.50 [0.30] | 755.94 [0.90] | 754.63 [0.99] | 754.18 [0.99] | 752.13 [0.99] | 747.41 [0.46] |
| M2[b], $z$; [pr > z] | 1.39 [0.16] | 1.40 [0.16] | 1.52 [0.13] | 1.49 [0.14] | 1.52 [0.13] | 1.47 [0.14] | 1.55 [0.12] |

Number of observations: 720. Standard errors are in parentheses.

  * Significance at 0.10.
  ** Significance at 0.05.
  *** Significance at 0.01.
  [a] Sargan test of over-identifying restrictions (Null: Instruments are valid).
  [b] Arellano–Bond test that average autocovariance in residuals of order 2 is 0.

**Table 7**
Income, social capital and polity: Arellano–Bond GMM estimates. Dependent variable: *income* (log of per-capita income, PPP).

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| *lagged income* | 0.699*** (0.038) | 0.696*** (0.038) | 0.696*** (0.037) | 0.692*** (0.037) | 0.698*** (0.037) | 0.691*** (0.037) |
| *cim* | 0.135** (0.055) | 0.119** (0.055) | 0.136** (0.055) | 0.123** (0.056) | 0.129** (0.056) | 0.112** (0.056) |
| *literacy* | −0.006*** (0.001) | −0.006*** (0.001) | −0.005*** (0.001) | −0.006*** (0.001) | −0.006*** (0.002) | −0.005*** (0.002) |
| *openness* | 0.097*** (0.025) | 0.107*** (0.024) | 0.108*** (0.024) | 0.109*** (0.024) | 0.111*** (0.024) | 0.106*** (0.023) |
| *polity* | −0.002 (0.003) | 0.006** (0.003) | 0.021*** (0.007) | 0.023*** (0.007) | 0.022*** (0.007) | 0.021*** (0.007) |
| *polity × cim* | 0.003 (0.004) | −0.0002 (0.004) | −0.052** (0.021) | −0.056*** (0.021) | −0.054** (0.021) | −0.053** (0.021) |
| *openness × polity* | | −0.023*** (0.008) | −0.023*** (0.008) | −0.024*** (0.008) | −0.023*** (0.007) | −0.024*** (0.007) |
| *openness_squared × polity* | | 0.016*** (0.004) | 0.016*** (0.004) | 0.017*** (0.004) | 0.016*** (0.004) | 0.016*** (0.004) |
| *polity × cim_squared* | | | 0.042** (0.017) | 0.046*** (0.017) | 0.044** (0.017) | 0.044** (0.017) |
| *polity_squared × cim* | | | | | | 0.0027 (0.0024) |
| North | | | | 0.0024* (0.0014) | | 0.0027* (0.0015) |
| South | | | | | −0.0014 (0.0015) | |
| Constant | 0.009*** (0.002) | 0.008*** (0.002) | 0.008*** (0.002) | 0.008*** (0.002) | 0.008*** (0.002) | 0.008*** (0.002) |
| Wald test-$\chi^2$ | 1591.71 | 1796.94 | 1925.83 | 1941.48 | 1922.13 | 1939.78 |
| Sargan test[a], $\chi^2$, [prob > $\chi^2$] | 751.21 [0.24] | 745.69 [0.48] | 749.28 [0.92] | 748.72 [0.93] | 746.59 [0.93] | 746.39 [0.99] |
| M2[b], $z$; [pr > z] | 1.44 [0.15] | 1.17 [0.24] | 1.13 [0.26] | 1.20 [0.23] | 1.11 [0.27] | 1.26 [0.21] |

Number of observations: 720. Standard errors are in parentheses.

  * Significance at 0.10.
  ** Significance at 0.05.
  *** Significance at 0.01.
  [a] Sargan test of over-identifying restrictions (Null: Instruments are valid).
  [b] Arellano–Bond test that average autocovariance in residuals of order 2 is 0.

The need for the entrepreneur to monitor agents and the extent of uncertainty, which are higher in low-trust societies, can have a significant negative effect on innovation in new products or processes (Knack and Keefer, 1997). In addition, social capital and human capital may have a significant influence on each other. Coleman (1988) shows that social capital has an important contribution to human capital. High-trust societies may value returns on education higher and thus would have higher human capital. Knack and Keefer (1997, pp. 1253–1254) argue that "in low-trust societies, hiring decisions will be influenced more by trustworthy personal attributes of applicants, such as blood ties or personal knowledge, and less by educational credentials, than in high-trust societies, reducing the returns to acquisition of educational credentials in low-trust societies." Gradstein and Justman (2000) develop a political economy model in which social cohesion reduces rent seeking and enhances incentives for investing in human capital, and show that public education has a positive effect on social cohesion (social capital). On the other hand, social capital may affect informal learning and thus may reduce skill enhancement and more formal and higher learning (Field and Spence, 2000).

Given the existing evidence on the interaction between social and human capital, we estimate additional equations and examine the joint effect of literacy and *cim*. The results displayed in Table 8 are obtained from four equations. Eqs. (1) and (2) use 'civil liberties' as indicator of institutional quality, while Eqs. (3) and (4) use the variable 'polity'. The results indicate that the coefficient on the term 'literacy × *cim*' is positive and significant at the 5-percent level (or better) in all four equations. However, the interaction between the square form of literacy and social capital (*cim*) is negative, suggesting that human capital and social capital in Africa are complements at low levels of human capital (literacy) and may become substitute at higher levels. In addition, the coefficient on the variable *cim* is no longer statistically significant, suggesting that the effects of social capital on development are mainly through its impact on

**Table 8**
Social capital and human capital: Arellano–Bond GMM estimates. Dependent variable: *income* (log of per-capita income, PPP).

| | (1) Institutions = civil lib | (2) Institutions = civil lib | (3) Institutions = polity | (4) Institutions = polity |
|---|---|---|---|---|
| lagged income | 0.706*** (0.037) | 0.709*** (0.038) | 0.623*** (0.038) | 0.664*** (0.038) |
| cim | −0.027 (0.135) | −0.059 (0.157) | −0.133 (0.123) | −0.241 (0.149) |
| literacy | −0.047** (0.002) | −0.009*** (0.002) | −0.0028 (0.0022) | −0.0086*** (0.0021) |
| openness | 0.123*** (0.036) | 0.120*** (0.024) | 0.120*** (0.025) | 0.124*** (0.024) |
| Institutions | 0.120 (0.503) | 0.175 (0.503) | 0.025*** (0.007) | 0.027*** (0.007) |
| Institutions × cim | −1.345 (1.150) | −1.450 (1.153) | −0.070*** (0.022) | −0.078*** (0.022) |
| Institutions_squared | 0.632 (0.390) | 0.658* (0.390) | | |
| Institutions × cim_squared | 0.775 (0.761) | 0.796 (0.766) | 0.057*** (0.017) | 0.063*** (0.018) |
| literacy_squared | −0.0005*** (0.0001) | | −0.0006*** (0.0001) | |
| literacy × cim | 0.0053** (0.0024) | 0.009** (0.0038) | 0.067** (0026) | 0.013*** (0041) |
| Institutions × openness | | | −0.023*** (0.007) | −0.022*** (0.008) |
| Inst × open_squared | | | 0.017*** (0.004) | 0.016*** (0.004) |
| literacy_squared × cim | | −0.0005** (0.0002) | | −0.0001*** (0.00002) |
| constant | 0.008*** (0.002) | 0.008*** (0.002) | 0.008*** (0.002) | 0.008*** (0.002) |
| Wald test-$\chi^2$ | 1898.73 | 1888.49 | 1781.66 | 1801.51 |
| Sargan test[a], $\chi^2$ [prob > $\chi^2$] | 749.80 [0.99] | 750.76 [0.99] | 737.20 [0.32] | 734.80 [0.34] |
| M2[b], z; [pr > z] | 1.60 [0.11] | 1.55 [0.12] | 1.41 [0.16] | 1.33 [0.18] |

Number of observations: 720. Standard errors are in parentheses.
* Significance at 0.10.
** Significance at 0.05.
*** Significance at 0.01.
[a] Sargan test of over-identifying restrictions (Null: Instruments are valid).
[b] Arellano–Bond test that average autocovariance in residuals of order 2 is 0.

institutions (at least in the case of political institutions) and human capital.

Thus, the empirical results provide strong evidence that social capital has a positive influence on development. It seems that the effects social capital, in the form of generalized trust, has on development are through its interaction with institutional quality and human capital. We also note that political institutions and openness to trade have positive effects on income. In addition, institutions seem to have an important impact on the effectiveness of trade at high levels of openness, suggesting that in countries with weak institutions increased openness to trade may not be beneficial (see Baliamoune-Lutz and Ndikumana (2007) for more detailed empirical evidence from African countries).

## 5. Concluding comments

The primary goal of this paper is to explore the development effects of institutions and trust-based social capital, using contract-intensive money as indicator of generalized trust. In particular, we examine the joint effect of social capital and institutions on income per capita and test whether social capital enhances the effectiveness of institutions. Results from fixed-effects and Arellano–Bond GMM estimates using data from 39 African countries, indicate that, in general, both social capital and institutions have robust positive effects on income. The joint effect of social capital and institutions is robustly positive and statistically significant. Once we take into account the interaction between human capital and social capital, we find that the positive effects of social capital on income operate primarily through the impact of social capital on human capital and political institutions.

This result suggests that social capital and political institutions in Africa complement each other. This is consistent with the findings in Knack and Keefer (1997), Baliamoune-Lutz and Lutz (2004) and Baliamoune-Lutz (2009a). This conclusion is not necessarily inconsistent with the findings in micro-based studies such as Minten and Fafchamps (2002) who report that, among agricultural traders in Madagascar, social capital may substitute for weak institutions. However, it does underscore the differences between the conclusions from macro-level studies based on generalized trust, which is more relevant for anonymous trade, and those from micro-level studies based on thick or network-based trust (strong ties), which is more relevant for personalized trade. Moreover, it is possible that social capital functions as a substitute for institutions when institutions are weak, but becomes a complement to institutions as institutional quality improves. However, we fail to find unambiguous evidence in support of this proposition in the present study.

We conclude by pointing out that more recently some scholars began to question the relevance of property rights for developing countries where entrepreneurship is weak or discouraged. Colombatto (2004) in particular, provides a very interesting discussion of these issues. According to Colombatto, the origins of success in the fight among competing civilizations are identified by two major notions; the principles of entrepreneurship and of individual responsibility, with geography and ideology having significant impact on these two principles. Thus, the author argues

> Clearly specified and enforced property rights—private property rights in particular—are of course also necessary. But without entrepreneurship and self-responsibility property rights per se do not generate growth. An ideological or cultural environment hostile to individual responsibility means that individuals are reluctant both to develop new knowledge and to take advantage of their talents, irrespective of the potential for high monetary rewards. Furthermore, such an environment tends to discourage outsiders, who may indeed be willing to take responsibilities, but are afraid that free riders or rent-seekers would be morally justified in interfering, if not explicitly encouraged to do so. Stagnation and poverty are the obvious results.
> Colombatto (2004, p. 257)

The role of social capital in this context may be very important and the results derived in this paper seem to be in support of these arguments. Social structure and networks can play a key role in innovation (Rogers, 2003; MacKenzie and Millo, 2003; Granovetter, 2005). Social capital in the form of generalized trust, network-generated trust, and cooperative norms may serve to reduce the uncertainties faced by entrepreneurs and thus may promote entrepreneurial activities and spur growth and development.

## Acknowledgments

## Appendix A.

### A.1. Source of data and variable description

Data on contract-intensive money are constructed using data on currency in circulation and M2 (money and quasi money from the international financial statistics CD ROM (IMF, 2005)). Data on income and literacy are from the World Bank World Development Indicators CD ROM, 2004. Data on civil liberties are from Freedom in the World Tables, Freedom House (2004). The index of civil liberties is on scale from 1 to 7 with one indicating the highest degree of liberties and 7 the lowest degree of liberties. We have inverted the index so that higher values mean higher levels of civil liberties. Data on property rights are from the Index of Economic Freedom Tables Gwartney, James and Robert Lawson, with Erik Gartzke (2004). We use the score of 'legal system and property rights' and refer to as 'property rights'. The index of property rights is between 0 and 10 with 10 indicating the highest level of property rights. Data on the *polity* variable are the values for the variable 'Polity 2' from the Polity IV project (Monty G. Marshall and Keith Jaggers, 2003). This variable is measured on a −10 to 10 scale, with higher values indicating better polity.

Data on income, literacy, civil liberties and political freedom are from 1975 to 2001. Data on property rights are for 1995 to 2001, with several countries missing data for the early years. Data on the *polity* variable are for the period 1975–2001.

The variables are defined as follows:

*income*: per-capita income, ppp (log)
*cim*: contract-intensive money, ratio of non-currency components of M2–M2
*literacy*: adult literacy rate is the percentage of people ages 15 and above who can, with understanding, read and write a short simple statement on their everyday life.
*lagcim*: five-year lag of *cim*
*civil lib*: civil liberties
*polity*: Polity 2
*propr*: property rights
*openness*: openness to international trade, ratio of exports and imports to GDP

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