

Institutional Quality and Financial Development in Sub-Saharan Africa

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January 5, 2010

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ABSTRACT

This contribution investigates the institutional determinants of financial development for 19 sub-Saharan African countries for the period of 1984 to 2007. Our findings indicate that some variables associated with high institutional quality exert a positive causal influence on financial development. Strong property rights protection and political stability are found to be the most important institutional factors promoting financial development. Our empirical results suggest that poor institutional quality in sub-Saharan Africa has constrained financial development in the past. Future improvements in institutional quality may promote economic development in parts through their positive effect on financial development.

Keywords: Financial Development, Institutional Quality, Economic Growth, Poverty, Sub-Saharan Africa

JEL Classification: E44, G20, O55

1 Introduction

A substantial body of literature suggests that high levels of financial development are necessary to trigger long-run economic growth.¹ Efficiently working financial markets are even argued to ameliorate poverty and income inequality, with recent empirical studies also pointing in this direction (e.g., Beck et al., 2007; Claessens and Perotti, 2007; Levine, 2008). However, only few studies suggest that in sub-Saharan Africa (henceforth *SSA*) finance has actually worked as an engine of economic development (e.g., Ghirmay 2004). Most studies find that financial development does not exert a positive causal effect on economic development (e.g., Reinhart and Tokatlidis, 2003; Atindéhou et al., 2005; Gries et al., 2009). What is more, financial underdevelopment and low levels of financial openness have been repeatedly named as sources of slow economic growth in SSA (Sachs and Warner, 1997; Easterly and Levine, 1997; Collier and Gunning, 1999; Azam et al., 2002).² This finding is not too surprising, given that financial depth and efficiency in SSA are low, also in comparison to other developing parts of the world. Financial underdevelopment in SSA becomes manifest in, e.g., limited financial products and financial innovation, wide interest rate spreads, a pronounced market fragmentation and a notable informal financial sector (e.g., Atindéhou et al., 2005; Ncube, 2007). Financial underdevelopment may translate into reduced factor accumulation and inefficient resource allocation, constraining economic development. For instance, low levels of financial development may limit the access to finance of rural households and small and micro enterprises in SSA, thus negatively affecting economic outcomes.

In this contribution we investigate the determinants of financial development in SSA, using cross-sectional time-series data for 19 SSA countries for the period of 1984 to 2007. In particular, we focus on the effect of *institutional quality* (measured by various indicators) on financial development, given that the link from 'good' institutions to financial development has gained support by recent theoretical and empirical contributions (Fergusson, 2006). Establishing an effect from institutional quality to financial development may furthermore unveil one channel of transaction through which 'good' institutions cause economic growth (Fergusson, 2006). Besides institutional quality, we also control for other factors potentially determining the development of financial markets in SSA (e.g., macroeconomic stability). As its main results, this study finds that better institutional quality is generally associated with higher levels of financial development. Secure property rights and political stability are identified as the most important institutional factors positively swaying financial development, whereas other institutional quality variables (e.g., corruption and bureaucracy) are not that strongly linked to finance. The positive

effect of institutional quality on finance is not driven by reverse causation. We find that some non-institutional variables (e.g., inflation levels) also influence the development of financial markets in SSA markedly.

The remainder of this contribution is organized as follows. In Section 2 we review the academic literature on the institutional determinants of financial development. Section 3 describes the empirical methodology and data. Section 4 presents the results of the empirical analysis of the institutional and non-institutional determinants of finance in SSA. In Section 5 we conclude.

2 Institutional Quality and Financial Development

North (1991:97) defines institutions as "the humanly devised constraints that structure political, economic and social interaction." That is, institutions are the rules of the game that shape incentives and opportunities. North (1991) differentiates between informal (e.g., traditions and taboos) and formal (e.g., constitutions and laws) institutions. Acemoglu et al. (2005) further distinguish between economic and political institutions. Economic institutions shape the rules of the economic game. They may influence investment and production decisions. For instance, contracting and property rights are often named as important (formal) economic institutions. Political institutions shape the rules of the political game. They may impact how political power is distributed, constrained and controlled. An example of a (formal) political institution is the political system of a country (e.g., democracy or autocracy). Higher *institutional quality* is associated with those (formal) economic and political institutions that allow for particularly strong economic performance and thus high levels of economic development. In the long run, institutional differences are argued to be among the main causes of global differences in economic development (Acemoglu et al., 2005).³ Ample (global) empirical evidence provides support for this notion (e.g., Rodrik et al., 2004; Acemoglu and Johnson, 2005; Acemoglu et al., 2005). For SSA the empirical evidence also indicates that poor (extractive) institutions resulting from the colonial past of SSA have markedly impaired economic growth (e.g., Price, 2003).

A basic argument of this contribution is that institutions (partially) influence national levels of economic development through their determining effect on financial development. Thus, institutions are the deep determinants of economic development, impacting the proximate determinants of development. As argued by Acemoglu et al. (2005), 'good' economic and political institutions (indicated by institutional quality variables) shape the incentives of agents in a society in ways that are conducive

to economic development, e.g., by promoting the accumulation of physical and human capital (i.e., the proximate causes of growth). The effect of institutions on development may also emerge through the effect of institutional quality on financial development as another intervening variable (as another proximate cause of growth). Countries with 'better' institutions (i.e., with higher institutional quality) exhibit more developed financial markets, which in turn promote economic growth and co-determine the distribution of income and the level of poverty within a country (Fergusson, 2006). While the theoretical and empirical literature has also investigated the non-institutional determinants of finance, considerable evidence exists linking higher institutional quality to more efficient financial markets, i.e., to higher levels of financial development (cf. Fergusson, 2006). Here, a variety of rules of the economic (economic institutions) and political (political institutions) game have been investigated as potential determinants of financial development.

Considering the role of economic institutions in financial development, a number of studies find that better property rights protection has a positive influence on the development of financial markets (e.g., Acemoglu and Johnson, 2005; McNulty et al., 2007). Correspondingly, when legal frameworks are strong, the level of financial development is consistently found to be higher (e.g., La Porta et al., 1998; Beck et al., 2003). By contrast, high levels of corruption may erode the protection of property rights and the efficiency of the legal framework, in consequence reducing the pace of financial development. In general, the existing empirical evidence suggests that a better protection of property rights (as an economic institution) is conducive to financial development. For instance, when property rights are protected, saving and investment (particularly in long-term projects) become more attractive. This should create additional demand for liquidity, financial services (e.g., the pooling of savings and the monitoring of investment) and more sophisticated financial instruments, in consequence leading to higher levels of financial development. By contrast, weak legal frameworks and high levels of corruption may be associated with lower property rights protection and thus lower levels of financial development.

With respect to the role of political institutions, the evidence indicates that political and administrative stability induce financial development (e.g., Girma and Shortland, 2008; Roe and Siegel, 2009). Furthermore, it is found that political systems that constrain the influence of specific interest groups (as it is common in democratic systems) exhibit more developed financial systems (e.g., Girma and Shortland, 2008; Herger et al., 2008). Thus, the evidence indicates that stable political systems that constrain executive influence exhibit higher levels of financial development. When systems are stable, there are more incentives to invest in the long run and to develop trust in the financial sector, e.g.,

as expropriations in the advent of political change are not likely. This should lead to more financial development. When political systems are designed in ways that minimize the influence of special interest groups (e.g., political elites), financial development is not impeded by these very groups. By contrast, when elitist influence is less restricted, this very influence may be used to constrain financial development. Financial underdevelopment may be promoted by the political elite because it is in their interest. For instance, as economic rents of the elite may be threatened when higher levels of financial development allow for strong competition to arise in domestic markets, the blocking of finance by the elite becomes attractive (cf. Rajan and Zingales, 2003).

From our short review, we generally conclude that institutions affect economic outcomes (partially) through their influence on financial development. The better the quality of the institutions the higher the level of financial development. Variables associated with a high quality of economic institutions are a strong protection of property rights, a robust legal framework and low levels of corruption. Variables linked to a high quality of political institutions are a stable and democratically accountable political system with a competent bureaucracy. In empirical studies, such variables may potentially be associated with higher levels of financial development.

3 Empirical Methodology and Data

3.1 Empirical Procedure

As argued before, we generally regard the level of financial development in any SSA country as a function of the quality of its institutions, net of potential effects of other non-institutional determinants. In order to empirically investigate in which ways these factors determine financial development, we mainly rely on *dynamic panel models*. A dynamic panel model makes optimal use of the data by exploiting both the cross-sectional (N) and time-series variation (T) in the data, and takes into account the joint occurrence of dynamic relationships and unobserved (individual) heterogeneity in the data (e.g., Bruno 2005). For our application this means that the empirical approach, inter alia, considers any short-run adjustments in financial development (operationalized by a lagged dependent variable), so that present levels of financial development depend on past ones.

Nickel (1981) shows that dynamic (autoregressive) panel models using the least square dummy variable estimator produce biased results when the time-series dimension of the data is finite. For our

sample (with $N=19$ and $T=21$) we thus have to find a dynamic panel model estimator that takes into account this bias. Here, Judson and Owen (1999) show that several estimators that are consistent with the Nickel bias yield biased results when N and T are relatively small. They show that the *corrected least square dummy variable estimator* (e.g., Kiviet, 1995; Bruno, 2005) is the most appropriate estimator when a dataset has characteristics as ours, so we employ this estimator when investigating the institutional and non-institutional determinants of finance in a dynamic panel model. Note that all independent variables enter this model as $(t-1)$ lagged values because we expect time-delayed effects from these variables on finance.

We also take into account the issue of *reverse causation* that plagues many empirical analyses. For our analysis we are particularly interested in whether financial development also influences institutional quality. Finding evidence of reverse causation may indicate that the findings from the dynamic panel model are affected thereof and thus not conclusive. Finding no evidence of reverse causation should provide additional support for the results from the model using the corrected least square dummy variable estimator. We test for Granger causality (Granger, 1969) in a panel VAR model as introduced by Holtz-Eakin et al. (1988). Given that we again analyze a dynamic (autoregressive) panel model we use the GMM estimator (Arellano and Bond, 1991) to obtain parameter estimations consistent with the Nickel bias. Note that we describe this approach in more detail below.

We also perform some *robustness checks*. On the one hand, we use further explanatory variables to see whether our findings are robust to changes in the data. On the other hand, we also run our standard empirical model with different empirical techniques, using the pooled OLS and fixed effects model. For the pooled OLS estimation we employ the Driscoll and Kraay (1998) standard errors that are robust to arbitrary heteroscedasticity and cross-sectional dependence. Because the pooled OLS model neither considers the time-series dimension of the data nor country-specific effects potentially influencing the estimation results, we also employ a fixed effects model that factors these points in.⁴ However, the fixed effects model is not dynamic; introducing a lagged dependent variable would yield biased results (Nickel, 1981). That is, the pooled OLS and fixed effects model have methodological shortcomings. Given that a dynamic panel model overcomes these flaws (i.e., not considering the time-series variation in the data and dynamic adjustments), we mainly rely on its results when assessing the evidence. However, finding that some factors determine financial development across different empirical techniques should add to the robustness of the findings from our main empirical model.

3.2 Variables and Data

We empirically analyze the determinants of financial development for 19 SSA countries for the period of 1984 to 2007. The countries in the sample are Botswana, Burkina Faso, Cameroon, Ethiopia, Gabon, Gambia, Ghana, Ivory Coast, Kenya, Madagascar, Malawi, Niger, Nigeria, Senegal, Sierra Leone, South Africa, Togo, Uganda and Zambia. Table 1 gives an overview of the descriptive statistics of all variables used in the main empirical analysis.

– Table 1 here –

Dependent Variable

The empirical literature suggests a number of proxies for financial development (e.g., liquid liabilities to GDP or stock market capitalization to GDP). There is no consensus on the superiority of any of these indicators. For this study we measure financial development by the ratio of *private credit by deposit money banks to GDP (PC)*. As argued by Baltagi et al. (2009), this variable is the most appropriate variable to indicate banking sector development, measuring one major finance activity, namely the channeling of savings to investors. Because formal financial systems in SSA are strongly bank-based and stock markets are not well-developed (e.g., Ncube, 2007), we believe that private credit is the indicator most suited to capture financial development in SSA in general. The data for private credit is from the *Financial Development and Structure Database* of Beck et al. (2000).

Institutional Variables

As we want to focus our analysis on the effect of economic and political institutions on financial development, we employ a number of indicators to capture institutional quality. All data is from the *International Country Risk Guide* (ICRG, 2009). The values for each variable are rescaled, so that they range from 0 to 1. Higher values of any institutional variable correspond to better institutional quality, with the exception being the corruption variable.

The quality of economic institutions is indicated by the *protection of property rights*, the level of *corruption* and the *rule of law*. The property rights variable contains information, e.g., on contract viability and the risk of expropriation. The corruption indicator assesses the amount of political corruption, e.g., connected with patronage or nepotism. The law and order variable measures the strength and independence of the judicial system and the quality of law enforcement.

The quality of political institutions is measured by the degree of *political stability* and of *democratic accountability*, and the quality of the national *bureaucracy*. The stability variables measures the risk of civil war, terrorism and civil disorder. The democratic accountability proxy indicates to which extent a regime responds to the demand of its people; in democratic regimes such accountability is anticipated to be higher than in autocratic ones. The bureaucracy variable measures to which extent a bureaucracy is independent from political power and government changes; when bureaucracies are strong, they are more independent and able to (partially) absorb shocks from regime changes or political instability, thus potentially sustaining financial development.

We furthermore create an overall indicator of *institutional quality*, defined as the sum of the sub-components of all variables indicating the quality of economic and political institutions (where the corruption score is rescaled accordingly).

Controls

We also control for the effect of a number of non-institutional factors potentially determining finance. In the appendix an overview is given on data sources, measurements and underlying hypotheses.

Some empirical studies (e.g., Svaleryd and Vlachos, 2002; Rajan and Zingales, 2003) find that *trade openness* is linked to financial development. When an economy is closed, incumbents (which control domestic product and financial markets) benefit from financial underdevelopment because it secures their rents from privileged market positions. It is in the interest of the incumbents to block financial development (Rajan and Zingales, 2003). With economic integration the incumbents need relatively more access to external finance (to expand into foreign markets and to defend markets against foreign competition) and to financial instruments that insure against risks trade carries (Svaleryd and Vlachos, 2002; Rajan and Zingales, 2003). Thus, they may give up support for financial repression, allowing for financial development instead.

Higher levels of *financial openness* (i.e., more access of international finance to domestic financial markets) may reduce financial repression through increased competition, may increase the demands for financial instruments and portfolio diversification (as capital becomes cheaper and more accessible to borrowers) and increase domestic financial efficiency by forcing inefficient domestic financial intermediaries out of the market (Chinn and Ito, 2006). Through these channels, higher levels of financial openness are anticipated to promote financial development. Chinn and Ito (2006) offer some evidence

for this hypothesis.

Rajan and Zingales (2003) stress that it is the *interaction of financial and trade openness* that matters to finance. Increased integration in only one field is not sufficient to change incumbents' favorable views on financial repression. Rather, such limited integration may help incumbents that control domestic markets (e.g., by granting them access to external finance without allowing for competition to arise). Following Rajan and Zingales (2003), simultaneously high levels of financial and trade openness are needed to establish enough pressure on incumbents to allow for financial development. Baltagi et al. (2009) offer some empirical support for this hypothesis.

Income may also determine finance. Some empirical studies find bidirectional finance-growth causation or even unidirectional causation from economic to financial development.(e.g., Demetriades and Hussein, 1996). For instance, economic growth may increase the real sector's demand for financial services, thus leading to financial development. In turn, finance may also depend on the state of the economy (e.g., Blackburn et al., 2005). From the existing evidence on finance-growth causation in SSA, we may assume that finance follows economic development in this part of the world. This means that for SSA higher income should be correlated with higher financial development.

Boyd et al. (2001) argue that higher levels of macroeconomic instability (*inflation*) coincide with distortions in financial sector performance. When inflation is high, financial intermediaries tend to lend less and allocate resources less effectively, e.g., as asset return volatility increases with inflation, producing costly information problems. Similarly, Rousseau and Wachtel (2002) find that episodes of high inflation are associated with a reduction in financial depth. Macroeconomic instability is thus anticipated to impede financial development, especially when inflation oscillates around certain threshold levels (Boyd et al., 2001; Rousseau and Wachtel, 2002).

Easterly and Levine (1997) argue that *ethnic tensions* impede financial development in SSA. For instance, ethnic tensions may negatively affect finance through ineffective government policies. When financial sector policies are established along ethnic and not efficiency lines, this may create financial sector distortions (i.e., financial repression). Other negative impacts running from ethnic tensions to financial development may, e.g., emerge through the negative effects of ethnic tensions on political stability and economic growth.

4 Empirical Results

4.1 Dynamic Panel Model

The results for the dynamic panel model using the corrected least square dummy variable estimator (cf. Judson and Owen, 1999) are reported in Table 2. Here, we find that the institutional factors most strongly associated with financial development in SSA are the protection of property rights and political stability. Finding that 'good' economic institutions in the form of strong property rights protection translate into financial development is consistent with the reasoning of, e.g., Beck et al. (2003) and Acemoglu and Johnson (2005). Property rights are fundamental to financial contracting. When these rights are strongly protected, this means that financial contracting becomes more attractive, leading to financial development in the long run (Beck et al., 2003).

The result that 'good' political institutions (as indicated by political stability) lead to financial development in SSA supports the view of Roe and Siegel (2009). This result also implies that political instability (weak institutions) may distort financial development. For instance, when political instability abounds it becomes less attractive for entrepreneurs to invest in long-term projects. Instead, they invest in short-term projects, thus having less demand for (sophisticated) finance. Consequently, political instability may produce financial underdevelopment, whereas politically stable economies do not suffer from such problems (cf. Roe and Siegel, 2009).

By contrast, there is little evidence from the dynamic panel model that corruption, bureaucratic efficiency, the rule of law or democratic accountability are significantly linked to financial development. This seems to indicate that not all institutional factors matter in similar ways to financial development. Arguably, variables indicating poor institutional quality may nevertheless impair economic development, e.g., with respect to the negative effects of corruption on economic growth (e.g., Mo, 2001). However, our findings indicate that related negative effects on economic development do not necessarily emerge through the channel of reduced financial development.

We also find a positive and (weakly) significant effect of our summary indicator of institutional quality on finance. This finding gives support for our basic assumption that institutions generally matter to financial development, meaning that higher institutional quality translates into a higher level of financial development. In the broader sense, this result supports the view of some previous studies postulating a similar hypothesis (cf. Fergusson, 2006)

– Table 2 here –

With respect to the control variables, the findings show that inflation and ethnic tensions are rather robustly linked to financial underdevelopment. While the former finding is in line with Boyd et al. (2001) and Rousseau and Wachtel (2002), the latter offers support for Easterly and Levine (1997). There is also a robust positive relationship between higher levels of economic development and finance, providing some support for the notion that finance indeed follows real sector demands in SSA (e.g., Gries et al., 2009). By contrast, we do not find that trade and financial integration (and their interaction term) are significantly linked to finance. That is, for SSA we do not find empirical evidence that economic and financial integration matter to finance, contrasting the (global) findings of Baltagi et al. (2009).

4.2 Panel Causality Analysis

In this subsection we want to discuss the possibility that our result of a positive effect of institutional quality on finance is driven by reverse causation. Evidently, there may also exist a causal link from financial development to institutional quality. In general, it seems possible that only financially developed countries are able to afford 'good' institutions (Fergusson, 2006). For instance, a country may profit from a beneficial interaction between efficient financial markets and high economic growth rates, enabling this country to 'buy' political stability, a strong judicial system or an effective bureaucracy (i.e., 'good' institutions). Although we previously tried to avoid reverse causation by lagging the explanatory variables one period behind the dependent one (which is a standard procedure in empirical analyses), we now also directly test for reverse causality. If we find no evidence for finance also causally influencing institutional quality, this should support our previously reported results.

For the causality analysis we follow Granger's (1969) definition of causality which implies causation in a statistical but not necessarily philosophical sense. That is, we are able to assess whether past levels of financial development (institutional quality) help to explain present levels of institutional quality (financial development). For the analysis we consider a time-stationary panel VAR model as introduced by Holtz-Eakin et al. (1988). We estimate the panel VAR in first differences in order to eliminate the individual effects from the model, so as to avoid a common problem in dynamic panel analyses. As the differenced error terms are correlated with the differenced lagged dependent variables, we use the GMM estimator (Arellano and Bond 1991) to obtain consistent parameter estimations by means of instrumental variables (i.e., we use lagged values of the explanatory variables at levels).⁵ Our panel

VAR takes the following form:

$$\Delta X_{it} = \alpha_0 + \sum_{l=1}^m \alpha_1 \Delta X_{it-l} + \sum_{l=1}^m \alpha_2 \Delta Y_{it-l} + \mu_{it} \quad (1)$$

$$\Delta Y_{it} = \beta_0 + \sum_{l=1}^m \beta_1 \Delta X_{it-l} + \sum_{l=1}^m \beta_2 \Delta Y_{it-l} + \mu_{it} \quad (2)$$

X and Y are our measures for financial development (PC) and overall institutional quality (containing information on property rights protection, political stability etc.). We create three-year averages (t) for our country sample (i) for these variables. Averaging the data reduces problems from using 'too many instruments' in the panel VAR model. Δ is the first difference operator. α and β are the regression coefficients. μ is the error term. The lag order of the independent variables may run from $l = 1$ to m .

Following Holtz-Eakin et al. (1988) and Podrecca and Carmeci (2001), our approach to testing for Granger causality in a panel framework involves the following steps. For any X to Granger-cause any Y , there has to be a significant effect of the lagged values of X_{t-l} on Y_t (i.e., $\sum \alpha_1 \neq 0$), conditional upon the lagged values of Y_{t-l} . This is examined by a Wald test for noncausality. The sign of the sum of the coefficients of $\sum \alpha_1$ indicates the direction of the causality effect. For instance, $\sum \alpha > 0$ means that a higher X causes a higher Y . In order to examine whether Y causes X , we have to check if $\sum \beta_2 \neq 0$, again using a Wald test. To make correct causality inferences, the lag length of the panel VAR has to be correct. We obtain the correct lag length m by a sequential Wald test that examines the joint significance of the added lags. Furthermore, the instruments have to be specified correctly, so the GMM estimators are consistent. The validity of the instruments is checked via the Hansen test for overidentifying restrictions and the Arellano-Bond test (*AB test*) for first and second order serial correlation.

The results of the panel causality analysis between financial development and institutional quality are reported in Table 3. These findings are generally consistent with the previously reported results. On the one hand, there is an overall positive and significant causal effect of institutional quality on financial development, meaning that factors such as property rights protection and political stability are preconditions of financial development. On the other hand, there is no evidence that financial development

causally influences institutional quality. The latter finding implies that financial development in SSA does not provide means for institutional development, e.g., by stimulating economic growth. This result is also consistent with the general notion that financial systems in SSA are underdeveloped and thereby do not contribute to economic development in substantial ways (e.g., Collier and Gunning, 1999; Azam et al., 2002; Atindéhou et al., 2005; Gries et al., 2009). Note that for all causality analyses, Wald tests reveal a correct lag length of $m = 1$. Note also that the Hansen overidentification and AB tests generally indicate that the instruments are specified correctly, leading to consistent GMM estimators and valid causality inferences.⁶

– Table 3 here –

4.3 Robustness Checks

Beside the investigation of reverse causation, we perform some further robustness checks to validate the empirical findings of the previous subsections. On the one hand, we add additional explanatory variables to our empirical model. On the other hand, we use alternative empirical techniques.

Further Explanatory Variables

We extract the level of democracy (the *Polity2 score*) from the *POLITY IV Dataset* in order to investigate whether the existence of democratic institutions influences the patterns of financial development. This proxy is similar to our institutional variable *democratic accountability* ($r = 0.60$). Correspondingly, when using this variable we obtain similar results, finding that this variable does not matter significantly to finance in SSA. In the dynamic specification of our model we find no evidence for the hypothesis that higher levels of democracy may constrain the influence of political elites on the financial sector, thus accelerating financial development (Girma and Shortland, 2008). When using this democracy variable, there is also no systematic change of the empirical results presented before, so they are robust to this modification of the empirical model.

We use government spending as a second additional explanatory variable, indicated by the *Government Share of Real GDP* from the *PENN World Table*. A priori, the effect of government spending on financial development is unclear. On the one hand, government spending may, e.g., result in financial underdevelopment when such spending is financed through financial repression (cf. Demirgüç-Kunt, 2008). On the other hand, government spending may also be used to, e.g., support macroeconomic

stability, expand the (financial) infrastructure or enhance finance supervision, so that higher government spending may translate into stronger financial development (cf. Demirgüç-Kunt, 2008). When government spending is introduced as an additional control variable, we find that it exercises a positive and significant effect on financial development in the dynamic panel model. This may indicate that government spending in SSA is, e.g., used to foster the financial infrastructure or improve the macroeconomic environment, so that financial development benefits from this. Note that when we employ the government share as an additional control variable in the dynamic panel model, the (previously reported) findings for the other variables do not change systematically.

Additional Empirical Techniques

Running pooled OLS and fixed effects model estimations, we can confirm the general finding from the dynamic panel model estimations, namely that institutions matter to finance in SSA.⁷ From both estimation techniques we find that overall institutional quality and sound property rights protection foster financial development. From the fixed effects model, we can also confirm that political stability is robustly conducive to financial development. That is, we find that those institutional factors identified as important from the dynamic panel model (strong property rights and political stability) are also found to be important using other empirical techniques.

Also, the pooled OLS and fixed effects estimations imply that high levels of bureaucratic quality and democratic accountability, and a strong rule of law may exert a positive impact on finance. Surprisingly, high levels of corruption are found to be associated with high levels of financial development in the fixed effects model. We obtain the reverse finding in the pooled OLS model (and find no strong link in the dynamic panel model), so the result may be an artifact of this empirical technique. However, it can also be argued that increased corruption leads to a 'liquidity bottleneck', thus raising the need for financial development. Given that the pooled OLS and fixed effect model have methodological flaws discussed above, we should not over-interpret the findings, in particular as the levels of corruption, bureaucratic quality and democratic accountability, and the rule of law are not found to matter to finance in the dynamic model specification. Overall, the findings imply that 'good' economic institutions (e.g., property rights protection, rule of law) are associated with higher levels of financial development. This is in line with findings from, e.g., Beck et al. (2003), Acemoglu and Johnson (2005) and McNulty et al. (2007). They also suggest that 'good' political and administrative institutions (e.g., political stability, bureaucracy) are linked to better finance, as previously argued by, e.g., Girma and Shortland

(2008), Herger et al. (2008) and Roe and Siegel (2009).

Considering the control variables in the pooled OLS and fixed effects model estimations, we find robust evidence identifying income as a positive and macroeconomic instability as a negative determinant of finance. These results are consistent with the ones from the dynamic panel model. The fixed effects model results imply that ethnic tensions reduce financial development, as previously found in the dynamic panel model.⁸ Interestingly, the results from both empirical techniques suggest that trade and financial openness positively affect finance, whereas their interaction has a negative influence. Mimicking the findings of Baltagi et al. (2009), this may imply that the marginal effects of trade (financial) openness are contingent upon the level of financial (trade) openness (so more closed economies benefit more from opening up trade or financial sectors.). However, when considering a dynamic specification of our estimation model, we have not been able to attribute a strong role to economic and financial integration in financial development, so that we again should not over-interpret these findings.

5 Summary

In this contribution we investigated the institutional and non-institutional determinants of financial development for a panel of 19 SSA countries for the period of 1984 to 2007. Our research was motivated by the fact that finance may function as an engine of economic development but did not work as such in SSA due to financial underdevelopment. We argue that institutions are in general important determinants of financial development. The low levels of financial development in SSA are (partially) a consequence of the 'weak' institutions in this part of the world, potentially as a consequence of the colonial past of SSA (cf. Price, 2003).

Consistent with our basic reasoning that institutional quality matters to finance, we find that for SSA better institutional quality generally leads to higher levels of financial development. Secure property rights and political stability are identified as the most important and robust institutional determinants of finance. Other variables indicating institutional quality (e.g., corruption and democratic accountability) are not that strongly linked to financial development. The positive effect of institutional quality on finance is not found to be driven by reverse causation. Rather, we identify a causal link running from past institutional quality to present financial development. Our empirical analysis also indicates that high levels of inflation and ethnic conflict may negatively influence financial development as relevant non-institutional determinants.

Our empirical analysis shows that certain institutional factors determine financial development in SSA, opening up an intervening channel through which institutions (as deep determinants of economic development) may enhance economic performance, in particular benefitting the poor (cf. Levine, 2008). Policies improving a country’s institutional framework may be successful (e.g., in terms of economic growth and poverty alleviation) through their stimulating effect on financial development. For SSA such policies should aim at offering a better protection of property rights and achieving political stability (cf. Demirgüç-Kunt, 2008). Policies directed at improving non-institutional conditions in SSA may also be helpful, where related efforts may include a stabilization of macroeconomic conditions (inflation control) and the sound management of ethnic conflict.

Appendix. Control Variables

GDP per Capita — *Description*: Real gross domestic product per inhabitant. Indicates structural macroeconomic conditions of a country. *Hypothesis (Expected Sign)*: Higher income is associated with higher levels of financial development (+). *Source*: PENN World Table (Heston et al., 2009). *Unit*: Natural logarithm, in constant 2000 US-\$.

Inflation — *Description*: Rate of change in the general level of prices. Indicates macroeconomic stability. *Hypothesis (Expected Sign)*: Higher levels of inflation are linked to lower levels of financial development (-). *Source*: World Development Indicators (World Bank, 2006). *Unit*: Percentage rate.

Trade Openness — *Description*: Sum of exports and imports to real GDP. Indicates the level of international integration of the real sector of an economy. *Hypothesis (Expected Sign)*: Higher levels of trade openness coincide with higher levels of financial development (+). *Source*: PENN World Table (Heston et al., 2009). *Unit*: Ratio of exports and imports to GDP, in constant 2000 US-\$.

Financial Openness — *Description*: Index of financial openness, constructed using information on exchange rates, current account and capital account restrictions, and on the handling of export proceeds. Indicates the level of international integration of the financial sector of an economy. *Hypothesis (Expected Sign)*: Higher levels of financial openness coincide with higher levels of financial development (+). *Source*: Chinn and Ito (2006). *Unit*: Constructed index.

Ethnic Tensions — *Description*: Assesses the degree of tensions attributable to racial, nationality or language divisions in a country. *Hypotheses (Expected Signs)*: Higher levels of ethnic tensions coincide with lower levels of financial development (-). *Source*: ICRG (2009). *Unit*: Rescaled index.

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Notes

¹Financial development refers to the process in which elements of the financial sector (comprising banks, stock markets, other financial intermediaries and a central bank) become more efficient in providing financial services (e.g., the pooling of savings and information management), so transaction, enforcement and information costs decrease. Theoretically, financial development may translate into economic growth by improved resource allocation and accumulation (Levine, 2005; Ang, 2008). Ample empirical evidence finds that finance is an important determinant of economic growth (e.g., King and Levine, 1993a,b; Ghali, 1999; Levine et al., 2000; Levine, 2005; Abu-Bader and Abu-Qarn, 2008; Ang, 2008).

²Collier and Gunning (1999), Azam et al. (2002) and Collier (2007) provide surveys of the empirical literature on economic development in SSA. Some studies also name geographical features (e.g., climate) as obstacles to growth. Besides financial underdevelopment, other studies find that slow growth is furthermore associated with low levels of trade openness, macroeconomic instability, deficient infrastructure, poor economic policies and political instability.

³Other factors that are discussed as fundamental determinants of economic development are geography, international integration and culture (cf. Rodrik et al., 2004; Acemoglu et al., 2005).

⁴Note that all independent variables enter this model in the $(t-1)$ lagged form as we again expect time-delayed effects from the independent variables to the dependent one. By lagging all independent variables, we also try to take into account the possibility of reverse causation.

⁵Podrecca and Carmeci (2001) use the same causality procedure. They also provide a more in-depth description of the methodological framework adopted here.

⁶Note also that when we experiment with different lag lengths and different sets of instruments, we in general arrive at results similar to the ones reported above.

⁷Supplemental tables showing the results of the pooled OLS and fixed effects model estimations are given in the appendix.

⁸A puzzling finding from the pooled OLS model is that ethnic tensions lead to higher levels of finance. However, this finding disappears when we use other (more advanced) empirical methods. It may thus be a mere artifact of this (simple) estimation technique.

Tables

Table 1: Summary Statistics

Variable	$N * T$	Mean	Std. Deviation	Min.	Max.
Private Credit	450	0.15	0.13	0.11	0.75
Institutional Quality	448	3.02	0.58	1.26	4.08
Property Rights	448	0.53	0.17	0	0.96
Political Stability	448	0.66	0.19	0.20	1
Corruption	448	0.57	0.17	0	1
Bureaucracy	448	0.27	0.17	0	0.75
Rule of Law	448	0.49	0.17	0	0.83
Accountability	448	0.51	0.20	0	0.92
GDP per Capita	456	3.25	0.32	2.82	4.02
Inflation	456	15.73	25.64	-20.81	189.98
Trade Openness	456	17.05	8.48	3.89	39.16
Financial Openness	456	-0.55	1.14	-1.81	2.54
Ethnic Tensions	448	0.47	0.18	0.17	0.90

Table 2: Corrected Least Square Dummy Variable Estimation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Private Credit t_{-1}	0.9263 (26.32) ^{***}	0.9254 (28.64) ^{***}	0.9284 (27.80) ^{***}	0.9288 (26.09) ^{***}	0.9254 (26.58) ^{***}	0.9345 (25.95) ^{***}	0.9331 (23.76) ^{***}
Institutional Quality t_{-1}	0.0047 (1.85) [*]						
Property Rights t_{-1}		0.0241 (2.87) ^{***}					
Political Stability t_{-1}			0.0187 (2.35) ^{**}				
Corruption t_{-1}				0.0119 (1.12)			
Rule of Law t_{-1}					0.0080 (0.84)		
Bureaucracy t_{-1}						-0.0162 (1.31)	
Accountability t_{-1}							0.0018 (0.24)
GDP p.c. t_{-1}	0.0471 (1.97) ^{**}	0.0412 (1.91) [*]	0.0486 (2.32) ^{**}	0.0428 (2.02) ^{**}	0.0467 (2.24) ^{**}	0.0532 (2.46) ^{**}	0.0512 (2.47) ^{**}
Inflation t_{-1}	-0.0001 (2.61) ^{***}	-0.0001 (2.12) ^{**}	-0.0001 (2.12) ^{**}	-0.0001 (2.37) ^{**}	-0.0001 (2.36) ^{**}	-0.0001 (2.21) ^{**}	-0.0001 (2.59) ^{**}
Trade Openness t_{-1}	0.0001 (0.11)	0.0000 (0.13)	0.0001 (0.20)	0.0002 (0.47)	0.0001 (0.30)	0.0001 (0.33)	0.0001 (0.17)
Financial Openness t_{-1}	0.0034 (1.02)	0.0036 (1.25)	0.0033 (1.15)	0.0027 (0.93)	0.0033 (1.17)	0.0027 (0.87)	0.0032 (1.05)
Openness Interaction t_{-1}	-0.0003 (1.47)	-0.0003 (1.75) [*]	-0.0002 (1.61)	-0.0002 (1.39)	-0.0003 (1.73) [*]	-0.0002 (1.23)	-0.0002 (1.56)
Ethnic Tensions t_{-1}	-0.0156 (1.70) [*]	-0.0198 (2.29) ^{**}	-0.0112 (1.16)	-0.0216 (2.40) ^{**}	-0.0187 (1.89) [*]	-0.0229 (2.30) ^{**}	-0.0224 (2.47) ^{**}
$N * T$	424	424	424	424	424	424	424

Notes: Significance levels based on bootstrapped standard errors (absolute z-values in parentheses). Bias correction initialized by Anderson-Hsiao estimator (100 repetitions). Openness Interaction is the product of the values of trade and financial openness. (*), (**) and (***) indicate significance at 10%, 5% and 1% levels.

Table 3: Panel Causality Analysis for Financial Development and Institutional Quality

Dependent Variable: PC (m=1)		Dependent Variable: INST (m=1)	
PC _{t-1}	0.5259 (7.76) ^{***}	PC _{t-1}	0.2842 (0.24)
INST _{t-1}	0.0184 (2.32) ^{**}	INST _{t-1}	0.5070 (2.80) ^{***}
<i>N * T</i> (No. of Instruments)	109(30)	<i>N * T</i> (No. of Instruments)	110(30)
Hansen (Overidentification)	0.903	Hansen (Overidentification)	0.904
M1/M2 (Serial correlation)	0.05/0.14	M1/M2 (Serial correlation)	0.13/0.10
Wald (Noncausality test)	5.37 ^{**}	Wald (Noncausality test)	0.06

Notes: One-step estimates. Absolute robust p-values in parentheses. Three-year averages for PC (private credit) and INST (institutional quality). (**), (***) indicate significance at 5% and 1% levels.

Supplemental Table 1: Pooled OLS Regression

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Institutional Quality	0.0593 (5.23) ^{***}						
Property Rights		0.1814 (3.82) ^{***}					
Political Stability			0.0110 (0.20)				
Corruption				-0.2197 (5.14) ^{***}			
Rule of Law					-0.015 (0.52)		
Bureaucracy						0.2288 (16.16) ^{***}	
Accountability							0.1611 (12.37) ^{***}
GDP p.c.	0.1664 (7.14) ^{***}	0.1792 (10.33) ^{***}	0.2052 (9.47) ^{***}	0.2008 (11.57) ^{***}	0.2064 (12.93) ^{***}	0.1463 (5.90) ^{***}	0.1860 (8.41) ^{***}
Inflation	-0.0009 (6.14) ^{***}	-0.0010 (5.56) ^{***}	-0.0011 (7.03) ^{***}	-0.0010 (8.35) ^{***}	-0.0012 (7.08) ^{***}	-0.0010 (8.42) ^{***}	-0.0011 (7.98) ^{***}
Trade Openness	0.0012 (3.82) ^{***}	0.0004 (0.81)	0.0013 (3.91) ^{***}	0.0010 (2.87) ^{**}	0.0012 (4.16) ^{***}	0.0011 (4.54) ^{***}	0.0018 (6.70) ^{***}
Financial Openness	0.0320 (2.39) ^{**}	0.0467 (3.23) ^{***}	0.0383 (2.53) ^{**}	0.0339 (2.56) ^{**}	0.0386 (2.78) ^{**}	0.0342 (2.77) ^{**}	0.0248 (1.85) [*]
Openness Interaction	-0.0023 (3.93) ^{***}	-0.0028 (4.41) ^{***}	-0.0025 (3.56) ^{***}	-0.0024 (4.18) ^{***}	-0.0025 (4.07) ^{***}	-0.0026 (4.55) ^{***}	-0.0018 (3.25) ^{***}
Ethnic Tensions	0.1560 (6.52) ^{***}	0.1175 (6.53) ^{***}	0.0948 (2.95) ^{**}	0.0972 (5.25) ^{***}	0.0839 (3.26) ^{***}	0.0900 (4.02) ^{***}	0.1014 (4.74) ^{***}
$N * T$	442	442	442	442	442	442	442
Prob > F	0.00 ^{***}	0.00 ^{***}	0.00 ^{***}	0.00 ^{***}	0.00 ^{***}	0.00 ^{***}	0.00 ^{***}
R ²	0.447	0.422	0.388	0.457	0.388	0.436	0.434

Notes: All models include time dummies (not reported). Robust Driscoll-Kraay standard errors in parentheses. Openness Interaction is the product of the values of trade and financial openness.

(*), (**) and (***) indicate significance at 10%, 5% and 1% levels.

Supplemental Table 2: Fixed Effects Estimation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Institutional Quality t_{-1}	0.0211 (3.90) ^{***}						
Property Rights t_{-1}		0.0996 (4.67) ^{***}					
Political Stability t_{-1}			0.0751 (4.40) ^{***}				
Corruption t_{-1}				0.0419 (1.78) [*]			
Rule of Law t_{-1}					0.0379 (2.01) ^{**}		
Bureaucracy t_{-1}						0.0714 (3.22) ^{***}	
Accountability t_{-1}							0.0198 (1.16)
GDP p.c. t_{-1}	0.1764 (4.55) ^{***}	0.1588 (4.07) ^{***}	0.1862 (4.86) ^{***}	0.1685 (3.99) ^{***}	0.1882 (4.80) ^{***}	0.1688 (4.26) ^{***}	0.1871 (4.67) ^{***}
Inflation t_{-1}	-0.0004 (3.53) ^{***}	-0.0004 (4.01) ^{***}	-0.0004 (3.80) ^{***}	-0.0004 (3.89) ^{***}	-0.0004 (3.35) ^{***}	-0.0004 (3.60) ^{***}	-0.0004 (3.78) ^{***}
Trade Openness t_{-1}	0.0032 (4.93) ^{***}	0.0028 (4.29) ^{***}	0.0034 (5.25) ^{***}	0.0037 (5.58) ^{***}	0.0035 (5.29) ^{***}	0.0034 (5.21) ^{***}	0.0035 (5.39) ^{***}
Financial Openness t_{-1}	0.0178 (3.12) ^{***}	0.0225 (3.89) ^{***}	0.0188 (3.31) ^{***}	0.0167 (2.88) ^{***}	0.0178 (3.06) ^{***}	0.0152 (2.65) ^{***}	0.0158 (2.70) ^{***}
Openness Interaction t_{-1}	-0.0007 (2.34) ^{**}	-0.0008 (2.73) ^{***}	-0.0006 (2.12) ^{**}	-0.0006 (1.96) [*]	-0.0007 (2.38) ^{**}	-0.0007 (2.43) ^{**}	-0.0006 (1.90) [*]
Ethnic Tensions t_{-1}	-0.0945 (4.91) ^{***}	-0.0980 (5.31) ^{***}	-0.0851 (4.33) ^{***}	-0.1248 (6.89) ^{***}	-0.1102 (5.76) ^{***}	-0.1144 (6.32) ^{***}	-0.1210 (6.66) ^{***}
$N * T$	424	424	424	424	424	424	424
Prob > F	0.00 ^{***}	0.00 ^{***}	0.00 ^{***}	0.00 ^{***}	0.00 ^{***}	0.00 ^{***}	0.00 ^{***}
R ²	0.389	0.399	0.395	0.370	0.371	0.381	0.366

Notes: All models include time dummies (not reported). Absolute t-values in parentheses. Openness Interaction is the product of the values of trade and financial openness. (*), (**) and (***) indicate significance at 10%, 5% and 1% levels.