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Sub-Saharan Africa's Integration in the Global Financial Markets

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Abstract

The paper uses a unique database covering 44 countries in sub-Saharan Africa (SSA) countries between 2000 and 2007 to study the determinants of the allocation and composition of flows across countries, as well as channels through which private capital flows could affect growth. In our sample, the degree of financial market development is an important determinant of the distribution of capital flows across countries as opposed to property rights institutions. The fairly consistent positive association between net capital flows and growth for SSA countries contrasts with the more pessimistic results of recent studies, though our data do not allow us to make conclusive inferences about a causality relationship.

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I. INTRODUCTION

For decades, Africa has been heavily dependent on official development assistance (ODA) to finance persistent balance of payments deficits. With low incomes and generally weak economic policies, most countries in sub-Saharan Africa (SSA) were unattractive to private investors, and thus received little private capital, except for foreign direct investment (FDI) in sectors focused on natural resource extraction. This has changed in the last decade.

Abundant global liquidity combined with improved economic policies and prospects in many SSA countries led to a surge in private capital flows, with sharp increases in all forms of private capital inflows—FDI, portfolio investment, and private debt flows—to SSA (Figure 1). As a result, in 2007 for the first time ever, private capital inflows increased almost six-fold since 2000 to reach an estimated US$84 billion, double the amount of ODA to SSA. The onset of the financial crisis radically changed the picture, with a drying up and, in some cases such as South Africa, a large reversal of capital flows.

These developments raise important questions and policy challenges for SSA countries. How dependable are these capital flows? Have they contributed, or are they likely to contribute to, improved economic growth prospects? How can governments enhance prospects for continued capital inflows, particularly in the face of the recent global financial crisis, which have seen a sharp decline in global liquidity and a reduced global appetite for risk? To begin to answer these questions, one must first understand better the factors driving the recent surge in private capital flows to SSA.

That is the objective of the paper: to identify factors behind the composition and distribution of recent private capital flows to sub-Saharan Africa, and to begin investigating their possible contribution to growth. Building on the observation that the distribution and composition of capital inflows varies substantially across SSA countries, we analyze the impact of key country characteristics in attracting different amounts and types of private capital.

Other studies have highlighted the importance of slow-moving determinants such as the level of economic development or growth performance, de jure capital account openness and the quality of institutions. These country characteristics are also going to have both a direct and indirect impact on growth in recipient countries, along with private capital flows, making it difficult to identify the direction of causality. To complicate matters further, the empirical literature is ambiguous as to whether capital flows have a positive impact on economic growth. To partly address these issues, we use an instrumental variables approach to study the determinants of private capital flows. On the growth impact, following Rodrik and Subramanian (2009), we use a two-step approach to investigate possible channels of transmission through which capital flows could influence growth: in order to have even a second-order impact on growth, capital flows should, as a necessary condition, at least have a first-order impact on variables known to influence growth.

Figure 1. Private Capital Inflows to Sub-Saharan Africa, 2000-07.
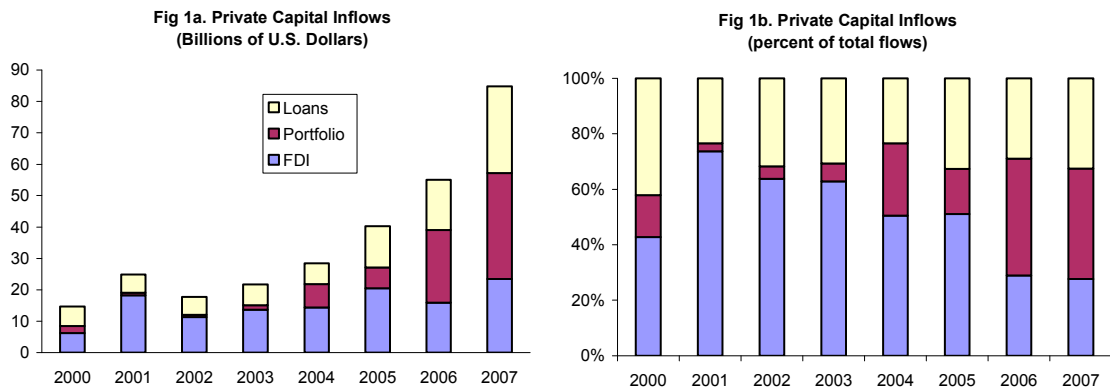
Source: African Department Database and IMF staff calculations.

On the determinants side, we find that capital market development, rather than basic property rights institutions, is more closely associated with higher private capital inflows. This may be a reflection of the increasing importance of portfolio and debt flows, relative to FDI, that has been observed in the recent period in SSA.

Looking at the growth impact, we find strong positive correlations between private capital inflows and real GDP growth in the recipient countries. However, in part because of the limited time-period of our sample, we are unable to prove a causal relationship whereby inflows increase growth.

The paper is related to recent research on determinants of capital flows, and on the growth impact of capital flows. As documented below, both strands of the literature are quite well-populated, but, to our knowledge, this study is the first to analyze these issues for the whole of sub-Saharan Africa, in the context of the recent surge in global private capital flows. It exploits a unique data set for 44 sub-Saharan African countries[1], including annual data on private capital inflows (broken down by FDI, portfolio, and private debt) between 2000 and 2007. Appendix I provides further details about the capital flows database and how it compares to similar, published datasets, and Appendix II presents the definitions and sources of other variables used in the empirical analysis.

The paper is organized as follows. Section II looks into recent trends in private capital flows to SSA. Section III discusses the determinants of private capital flows, and section IV investigates the association between these capital flows and growth. Section V concludes.

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[1] For the analysis we also had to exclude Zimbabwe, due to sketchy and unreliable data over the sample period.

II. RECENT TRENDS IN FINANCIAL GLOBALIZATION IN SSA

In the period of the recently-ended boom in global financial markets, inflows of private capital became the most important source of external finance for sub-Saharan Africa. The increase in private capital flows to the region was in line with that in other regions and all low-income countries (Dorsey et al., 2008, World Bank, 2007). On average, in the period between 2001 and 2007 total gross inflows to the region increased by 32 percent annually—the rate accelerating to 44 percent after 2005. Private capital flows to SSA have risen almost 6-fold since 2000, from about $15 billion to about $84 billion in 2007 (the latest year for which data is available). Recorded private capital outflows are on the whole much smaller than inflows, so that in 2007 net capital flows to sub-Saharan Africa amounted to about US$76 billion. As of 2007, private capital flows represented 10 percent of the region's GDP, about twice the volume of official development assistance (about US$40 billion).

A confluence of factors was responsible for the surge in private capital. A significantly improved macroeconomic performance across much of the continent (Figure 2), and for some countries the implementation of the Multilateral Debt Relief Initiative (MDRI), coincided with increases in global liquidity and higher oil and commodity prices (Figure 3).

Figure 2. Global Liquidity "Push" Factors
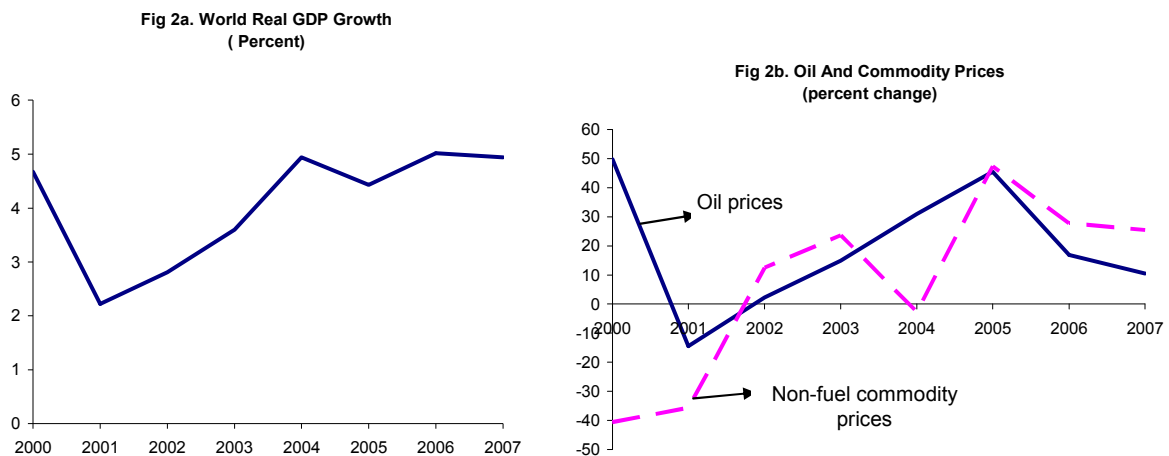
Source: African Department Database and IMF staff calculations.

Figure 3. Domestic "Pull" Factors

Fig 3a. Sub-Saharan Africa: Real GDP Growth and Per Capita GDP

Fig 3b.Sub-Saharan Africa: Inflation and Central Government Balance

Source: African Department Database and IMF staff calculations.

Note: Excluding Zimbabwe.
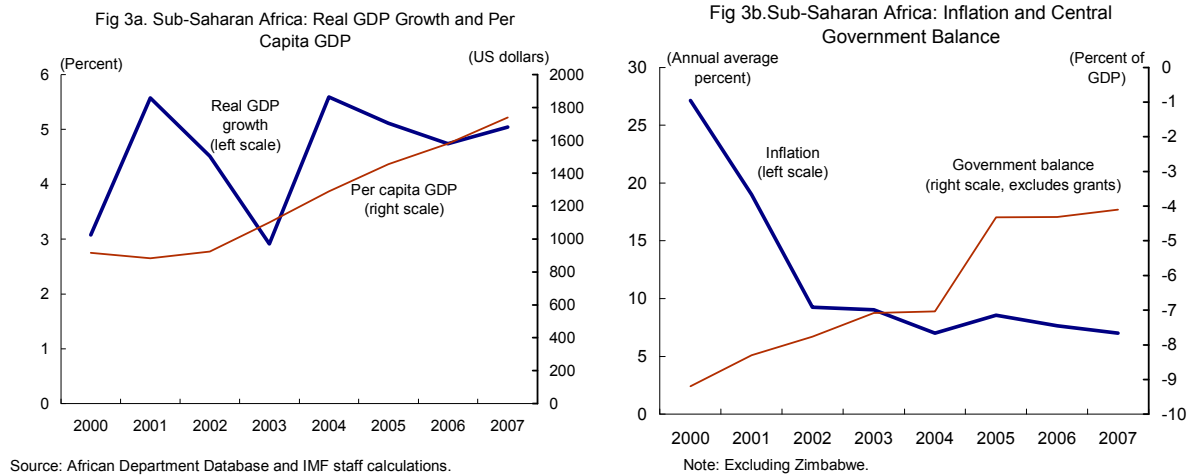
These inflows represent a potential source of vulnerability, as countries become increasingly dependent on potentially volatile private capital flows. While the overall volatility of capital flows fell in the latter years in the sample, the volatility of FDI has actually increased. (Table 1).[2] In addition, for low income SSA countries in particular, there has been a strong correlation between capital inflows and current account balances, with inflows increasing as the current account improves and decreasing as the current account deteriorates, magnifying the resulting swings in the overall balance of payments (Figure 6). On the other hand, the surge in private capital inflows has contributed to a steady increase in international reserves of SSA countries, providing these countries with increased scope to finance balance of payments deficits.

Table 1. Private Capital Flows: Volatility						
	2000-03			2004-07		
	Mean	Standard Deviation	Volatility	Mean	Standard Deviation	Volatility
Total inflow	19.8	4.5	4.4	52.2	24.3	2.1
FDI	12.4	5.0	2.5	18.6	4.2	4.5
Portfolio	1.3	0.7	1.9	17.7	13.1	1.4
Private debt	6.1	0.5	13.2	15.8	8.8	1.8

Source: IMF African Department database, 2008

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[2] An important factor in the increase in FDI volatility seems to be a fairly large movement in FDI in South Africa in 2005-2006.

Figure 4. Recipients of Private Capital Flows

Fig 4a. Share of FDI Inflows: 2000-03

Other SSA, 28.5
South Africa, 27.3
Chad, 5.0
Equatorial Guinea, 5.8
Angola, 16.5
Nigeria, 16.8
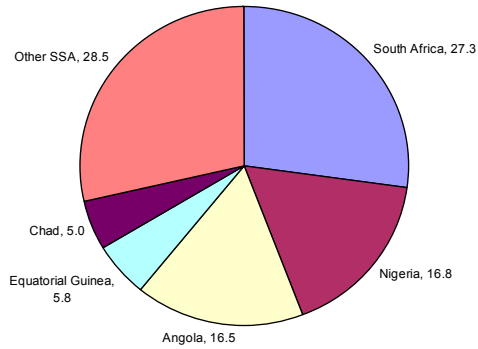
Fig 4b. Share of FDI Inflows: 2004-07

Other SSA, 33.8
Nigeria, 34.3
Congo, Republic of, 2.9
Tanzania, 3.2
Equatorial Guinea, 10.2
South Africa, 15.5
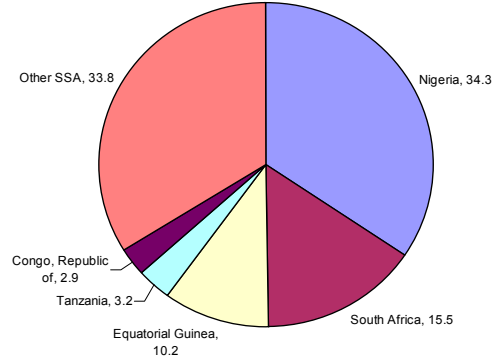
Fig 4c. Share of Portfolio and Debt Flows 2000-03 (percent of total)

Other SSA, 49.6
South Africa, 23.1
Kenya, 7.4
Ethiopia, 6.8
Ghana, 6.8
Congo, Dem. Rep. of, 6.3
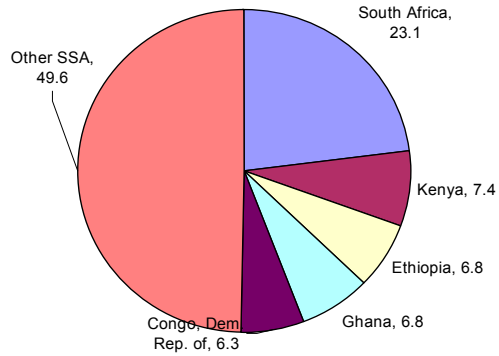
Fig 4d. Share of Portfolio and Debt Flows 2004-07 (percent of total)

Other SSA, 15.7
Kenya, 1.7
Angola, 2.0
Ghana, 2.2
Nigeria, 5.6
South Africa, 72.8
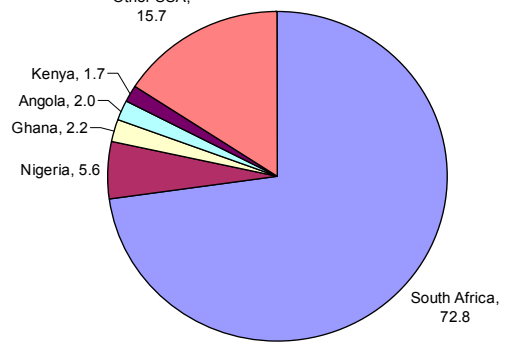
Figure 5. Top Ten Recipients of Private Capital

Fig 5a. Total Inflows (millions of U.S. dollars)

Ethiopia
Tanzania
Congo, Dem. Rep. of
Chad
Ghana
Kenya
Equatorial Guinea
Angola
Nigeria
South Africa
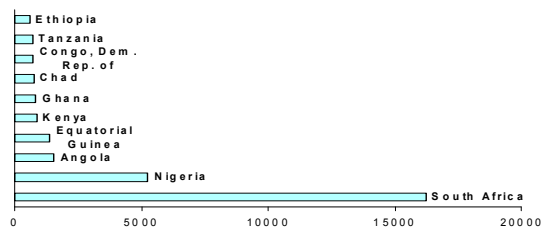
Fig 5b. Inflows to GDP (percent)

São Tomé & Príncipe
Cape Verde
Angola
Congo, Dem. Rep. of
Congo, Republic of
Seychelles
Guinea-Bissau
Gambia, The
Chad
Equatorial Guinea
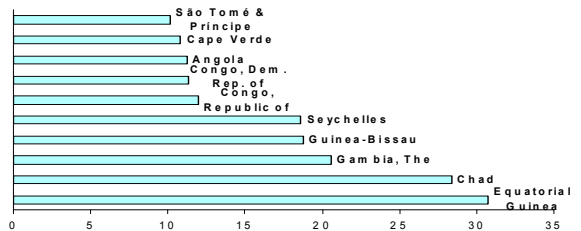
Fig 5c. Inflows to Population (ratio)

Angola
Gabon
Congo, Republic of
Cape Verde
Namibia
Botswana
South Africa
Mauritius
Equatorial Guinea
Seychelles
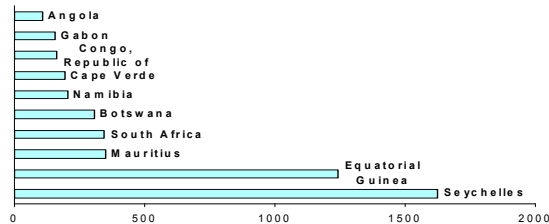
Note: All rankings based on averages for 2000-07.
Source: African Department data base and IMF staff calculations.

Figure 6. External Vulnerability

Fig 6a. Low-income African Countries: Current Account Balance and Capital Inflows, 2000-07

Fig 6b. Oil Producers: Current Account Balance and Capital Inflows, 2000-07

Fig 6c. Low Income Africa Countries: International Reserves and Capital Flows

Fig 6d. Oil Producers: International Reserves and Capital Flows
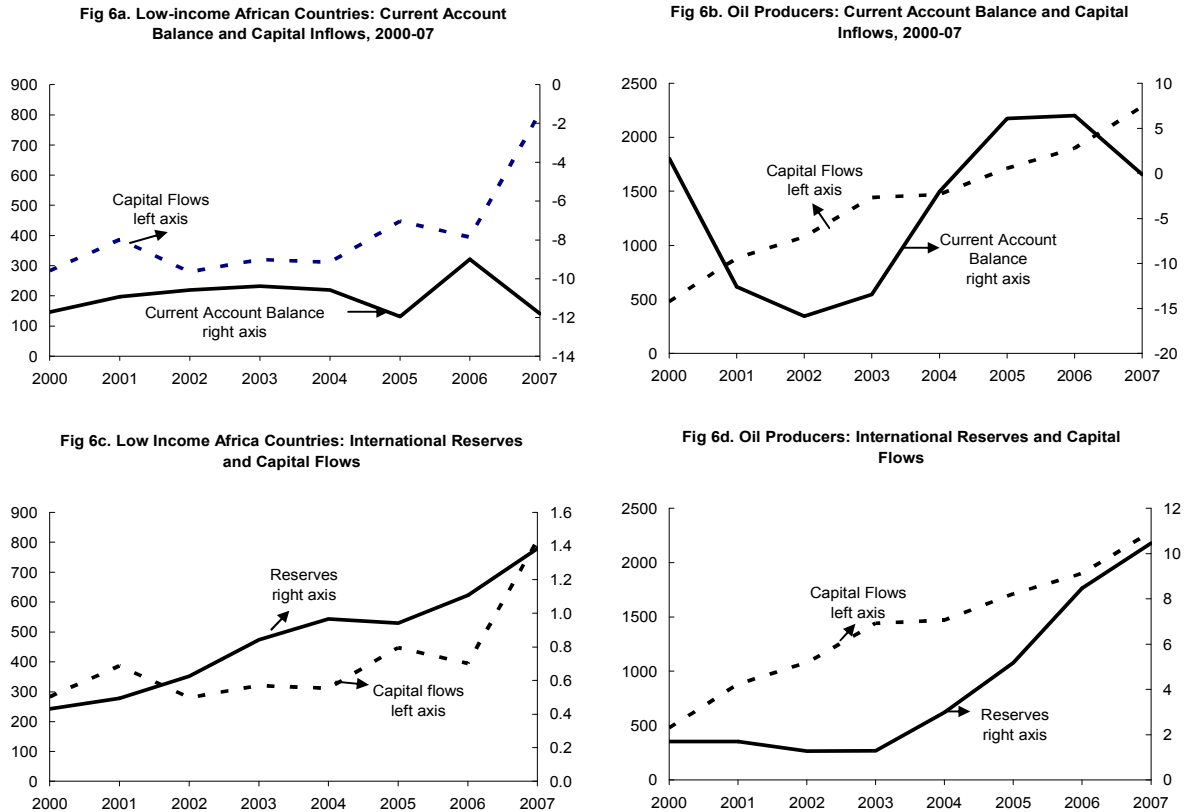
III.   DETERMINANTS OF PRIVATE CAPITAL FLOWS TO SSA

This section investigates the determinants of private capital flows to sub-Saharan Africa during 2000-2007, with particular focus on the role of domestic capital market development. Capital flows to sub-Saharan Africa, particularly portfolio flows, have been concentrated in a relatively small number of countries with relatively sophisticated financial markets. In these countries capital has flown into equities where the stock market was sufficiently developed (e.g. Kenya, Nigeria), government bonds in countries that had sovereign issues (Botswana, Ghana), and short-term government securities (Uganda, Tanzania and Zambia) when few other investment vehicles open to non-residents were available. The availability of investment instruments appears to have dominated the existence of capital controls. For example, in Tanzania legal loopholes allowed international investors to purchase significant amounts of government securities although in principle foreigners were not allowed to hold government debt (IMF, 2008).[3]

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[3] Nevertheless, targeted capital controls as in Ghana appear to have been successful in developing the longer end of the market for government debt.

We use a new indicator of capital market development in sub-Saharan Africa that captures the structure of capital markets. Capital markets, along with money, foreign exchange and derivatives markets, form part of a country's "essential financial markets" (Stone et al., 2008, Lukonga, forthcoming). In particular, we consider government securities markets, both for treasury bills and treasury bonds, as well as corporate bond markets and equities markets (see Lukonga, forthcoming). We construct a simple index, which is the sum of four dummy variables taking the value of 1 if the market in question exists and is well-developed. The index covers all sub-Saharan African countries except Somalia. Using this index, simple tabulations show that the average level of financial market development is fairly low in sub-Saharan Africa, with only 10 countries or 21 percent of the sample countries having complete capital markets (Table 2).[4] However, as discussed earlier, these countries are also among the largest recipients of private capital inflows in sub-Saharan Africa, along with a few oil exporters (Angola, Congo, Chad and Equatorial Guinea).

While the role of institutional development in attracting international capital flows has been emphasized in recent studies, very few have attempted to isolate the role of financial versus basic property rights institutions. The measures of financial market development used in the literature and that would be available for low-income countries, such as ratios of money and credit to GDP, have their limitations. They measure outcomes, such as the ability of the financial (mostly banking) sector to provide transaction services (in the case of the ratios of money or broad money to GDP) or the capacity of the banking system to channel savings, rather than the extent of financial market development as measured by the availability of investment instruments.

Our empirical results, detailed below, indicate that, along with other factors such as market size (particularly for portfolio inflows) and oil exporting status (particularly for FDI flows), the index of capital market development is a significant and robust determinant of international capital flows to sub-Saharan African countries.

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[4] The countries are Botswana, Ghana, Kenya, Namibia, Nigeria, South Africa, Swaziland, Tanzania, Uganda and Zambia.

Table 2. Capital Market Development in Sub-Saharan Africa

	Capital Markets			
			Corporate	
	T-Bills	T-Bonds	Bonds	Equities
Botswana	X	X	X	X
Ghana	X	X	X	X
Kenya	X	X	X	X
Namibia	X	X	X	X
Nigeria	X	X	X	X
South Africa	X	X	X	X
Swaziland	X	X	X	X
Tanzania	X	X	X	X
Uganda	X	X	X	X
Zambia	X	X	X	X
Benin	X	X	X	*
Burkina Faso	X	X	X	N
Cape Verde	X	X	N	X
Mauritius	X	X	*	X
Mozambique	X	X	X	*
Zimbabwe	X	X		X
Angola	X	X	N	N
Côte d'Ivoire	N	X	N	X
Gambia, The	X	X	N	N
Senegal	X	X	N	*
Seychelles	X	X	N	N
Cameroon	N	N	*	X
Congo, Dem. Rep. of	X	N	N	N
Ethiopia	X	N	N	N
Guinea	X	N	N	N
Guinea-Bissau	X	N	N	N
Lesotho	X	N	N	N
Madagascar	X	N	N	N
Malawi	X	N	N	*
Rwanda	X	N	N	N
Sierra Leone	X	*	N	N
Togo	X	*	N	*
Burundi	*	N	N	N
Central African Republic	N			
Chad	N	N	N	N
Comoros	N	N	N	N
Congo, Republic of	N	N	N	N
Equatorial Guinea	N	N	N	N
Eritrea	*	N	N	N
Gabon	N	N	N	N
Liberia	N	N	N	N
Mali	N	N	*	N
Niger	*	*	N	*
São Tomé and Príncipe	N	N	N	N

Sources: Lukonga (forthcoming) and authors' calculations.
Notes. X denotes that the market is fairly or very well developed
* denotes that the market nominally exists or is partially developed
N denotes that the market does not exist.

A. Recent Literature

The starting point of much of the recent literature on determinants of capital flows has been an attempt to explain the Lucas Paradox, or why private capital doesn't seem to flow from rich to poor countries. Standard neoclassical theory predicts that capital should flow from capital-rich countries (with low marginal productivity of capital) to capital-scarce countries (with a high marginal product of capital). In practice however, the bulk of observed flows, particularly in the modern period, consists of flows among developed economies. Compared to the early 20th century era of financial globalization, the current wave of capital flows is characterized by massive diversification of flows between high-income economies and a relative marginalization of less-developed economies (Obstfeld and Taylor, 2004, Schularick, 2006, and Schularick and Steger, 2008).

Some authors posit that the paradox is due to country-specific fundamentals that tend to lower the marginal product of capital in developing countries, such as missing factors of production including human capital, poor economic policies, and poor institutions (Alfaro, Kalemli-Ozcan and Volosovych, 2005a and 2005b, Faria et. al, 2006, Faria and Mauro, 2004, Schularick and Steger, 2008). In this vein, a recent study shows that the extent of domestic financial market development and the quality of domestic financial institutions has played a significant role in attracting capital flows to emerging markets (IMF, 2007). The second set of explanations centers around international capital market imperfections, such as asymmetric information, sovereign risk and capital controls. For example, Portes and Rey (2005) find that informational frictions, proxied by geographic distance, affect the amount and direction of capital flows, and Lane (2004) also finds that credit market frictions are a determinant of debt flows in 1970-1995.

The studies that focus on the role of institutions in attracting foreign private capital highlight the importance of basic institutions, particularly property rights protection. Weak property rights, owing to poor quality institutions, affect entrepreneurs' investment decisions. Risks of expropriation, armed conflict, and malfunctioning legal systems all have a potentially negative impact on the returns from those investments. Empirically, property rights institutions have been proxied by an index derived from the Kaufman, Kray and Mastruzzi World Governance Indicators—WGIs, or by an index derived from the ICRG indicators. [5] Using those proxies, better quality institutions are found to be positively and significantly correlated with foreign equity flows (Alfaro et al. 2005a, 2005b), and with a higher share of equity in a country's total stock of external liabilities (Faria and Mauro, 2004, and Faria et al., 2006).

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[5] The ICRG composite index aggregates over several dimensions, such as government stability, investment profile, internal and external conflict, non-corruption, law and order, protection from religious and ethnic tensions, non-militarized politics, democratic accountability and quality of bureaucracy (www.prsgroup.com). Similarly, the WGIs measure countries' score according to 6 governance dimensions, namely voice and accountability, political instability, government effectiveness, regulatory burden, rule of law and control of corruption (www.worldbank.org/wbi/governance/govdata).

As mentioned earlier, few studies focus on the role played by the extent of domestic financial market development in attracting international capital flows. While the literature tends to link capital flows (financial globalization) to improvements in domestic financial systems (e.g. Chinn and Ito, 2005, 2002, Mishkin, 2006), in principle the direction of causality is not clear. Chinn and Ito (2005), and Klein (2005) find empirical evidence supporting the notion of a threshold effect: financial openness contributes to equity market development only when a threshold level of general development of legal systems and financial development is attained. However, although property rights and financial institutions could potentially affect capital flows differently, no study of the determinants of capital flows has empirically attempted to properly disentangle the effects of both.

Ju and Wei (2007, 2006) develop theoretical models showing that financial institutions and property rights institutions can have different effects on capital flows. Whereas an inefficient financial system can be bypassed by international capital flows, as they could come in the form of FDI instead of portfolio and debt flows, high expropriation risk cannot be bypassed. Conversely, the stronger domestic property rights, the more the country will benefit from international capital flows.

B. Estimation strategy and Model

Cross-country regressions have been found appropriate to investigate the fundamental (and thus slow-moving) determinants of why some countries attract more inflows, or more of a certain type of inflows, than other countries. In particular, we are interested in testing whether financial institutions have a separate and different effect on capital inflows than property rights institutions. That effect may also differ depending on the type of capital flows. Empirically, Acemoglu and Johnson (2005) show that property rights and contracting/financial market development institutions do affect economic outcomes differently. While property rights institutions have a first order effect on economic outcomes such as long-run GDP growth, investment rates, and financial depth, contracting institutions seem to mostly affect the degree of financial market development. As others, we use instrumental variables to tackle the issue of reverse causality and endogeneity associated with the measures of institutions (Acemoglu and Johnson, 2005, Alfaro, Kalemli-Ozcan and Volosovych, 2005a and 2005b, Dell'Ariccia et al., 2008, Faria et. al, 2006, Faria and Mauro, 2004).

Building on the recent literature, the reduced-form linear equation to be estimated is:

$$K_i = \mu + \alpha \cdot F_i + \beta \cdot P_i + \chi \cdot C_i + u_i \tag{1}$$

Where K_i is log of average inflows to country i, F_i is a measure of financial institutions and P_i a measure of property rights, C_i is a set of exogenous control variables, and u_i is an independent error term. α, β, and γ are coefficients capturing the impact of financial development, property rights institutions and other controls on capital flows, where α and β are of particular interest, and μ is a constant.

Given that the measures of financial and property rights institutions are endogenous, simple OLS estimates of equation (1) will be biased. As indicated in Acemoglu and Johnson (2005), the α and β coefficients may capture reverse causality, or the effect of some other omitted characteristic. Second, as financial market development and property rights are measured with error, there may be a downward attenuation bias, and, finally, if contracting and property rights institutions are correlated the effect of the type of institution that is measured with greater error will load onto the other variable. Following Acemoglu and Johnson (2005), the estimation strategy therefore relies on estimating equation (1) with two-stage least squares (2SLS), using valid and separate instruments for financial and property rights institutions. The two first stage equations will thus be of the form:

$$F_i = v_1 + \delta_1 \cdot L_i + \eta_1 \cdot E_i + \chi_1 \cdot C_i + \varepsilon_{1i}$$
$$P_i = v_2 + \delta_2 \cdot L_i + \eta_2 \cdot E_i + \chi_2 \cdot C_i + \varepsilon_{2i} \quad\quad\quad (2)$$

Where L_i and E_i are instruments for financial institutions and property rights institutions, respectively. The key exclusion restriction is that $\text{Cov}(u_i, L_i) = \text{Cov}(u_i, E_i) = 0$, u_i being the error term in the second-stage equation (1).

C. Empirical Analysis

This study utilizes a unique data set on capital inflows to SSA, prepared by the staff of the International Monetary Fund, described in Appendix I.

Choice of variables

The following set of variables was chosen to estimate equations (1) and (2) (see Appendix II for definitions and sources. Descriptive statistics are presented in Appendix III, Table 1.

- Financial institutions are proxied by the simple index of capital market development described earlier (Lukonga, forthcoming). The more developed capital markets, the higher capital flows.

- Property rights institutions are proxied by the rule of law score from the World Governance Indicators (Kaufmann, Kray and Mastruzzi, 2008). Among the six governance dimensions used by Kaufmann et al, 2008, this is the closest proxy for property rights protection.[6] Better property rights protection should lead to higher capital flows.

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[6] Various other proxies for property rights institutions exist and have been used in empirical studies. Faria et al. (2006) and Faria and Mauro (2004) use the simple average of KKM's governance indicators for a single year. Alfaro et al. use the ICRG score (2005a, 2005b). Acemoglu and Johnson (2005) and Acemoglu, Johnson and

(continued…)

- Following Acemoglu and Johnson (2005), we use British legal origin as the instrument for financial market development, taken from La Porta et al. (1999). Acemoglu, Johnson and Robinson, 2002, Glaeser and Schleifer, 2002, and La Porta et al.,1999, show that in the case of former European colonies, legal origin is a valid instrument for contracting institutions/financial market development and property rights, respectively. Legal origin is shown to be positively and significantly associated with financial institutions, with civil law countries exhibiting lower financial development than common law countries (Glaeser and Schleifer, 2002, La Porta et al. 1999).

- The instruments for property rights institutions are the degree of ethno linguistic fragmentation and the country's latitude, taken from La Porta et al. (1999), which have been found to be associated with worse property rights and regulations.[7] Acemoglu and Johnson, 2005, Acemoglu Johnson and Richardson (2002), Faria et al. 2006, and Faria and Mauro, 2004, use settler mortality in 1500 or population density in 1500 and show that they are valid instruments for property rights institutions. For sub-Saharan African countries, however, settler mortality and population density in 1500 are available only for a subset of countries (Acemoglu and Johnson, 2002).[8] Given the better country coverage we have chosen to proceed with ethno linguistic fragmentation and latitude.

- A dummy variable to control for oil-exporting countries (the dummy variable takes the value of 1 if the country is an oil exporter). Oil-exporting countries attract more FDI, other things equal.

- A dummy variable to control for market size (the dummy variable takes the value of 1 if the country is South Africa or Nigeria). Larger and more sophisticated economies attract more capital flows.

Similar studies also include a number of additional explanatory variables, though it is more difficult both to argue that they are exogenous and to find valid instruments for them. We use these variables in our baseline regression.

- Human capital, proxied by the share of secondary school enrollment in the population, from the WDI. This variable features in explanations of the Lucas Paradox that focus on missing factors of production (Alfaro et al., 2005a, 2005b). The expected impact of higher human capital on capital flows is expected to be positive.

Robinson (2002) use average protection against expropriation risk and constraint on the executive as measures of property rights, but these measures are not available for a sufficiently large number of our sample countries.

[7] La Porta et al. (1999) however note that the adverse effects of ethno linguistic fractionalization on government performance tend to disappear when controlling for per capita income and latitude, except for public good provision and state-owned enterprises. This can be interpreted as countries with a large public enterprises sector tend to have less regard for private enterprises and private property rights.

[8] Robustness checks using population density in 1500 as an instrument yield results that are consistent with those obtained with ethno linguistic fragmentation (results not shown).

- A measures of de jure capital account openness, proxied by the Chinn-Ito measure of capital account openness, based on the IMF's AREAER (Chinn and Ito, 2007). We use the average value of the Chinn-Ito variable for sub-Saharan African countries over 1999-2005.[9] The effect of capital account openness on capital flows is expected to be positive.

- A measure of trade openness, proxied by the sum of exports and imports over GDP. Particularly at an initial stage, capital mobility develops around greater openness to trade flows. Arguably, countries that are more open to trade may also be politically more open to greater integration with the rest of the world.

- Macroeconomic performance, proxied here by the real GDP growth rate. In a panel study of 47 industrial and emerging countries, IMF (2007) find that expected macroeconomic performance, proxied by lagged real GDP growth, is a significant determinant of private capital inflows. IMF (2008) similarly finds that real GDP growth and lower fiscal deficits are significantly correlated with higher private capital inflows. Alfaro (2005b) uses inflation volatility as a proxy for macroeconomic performance. However, it is difficult to establish causality as inflows directly affect macroeconomic outcomes (also see below). Further, macroeconomic outcomes have been shown to be shaped by institutions, making it difficult to study the independent effect of institutional development on capital flows.

Correlations

Appendix Table III.2 shows pairwise correlations between different measures of capital flows, while Appendix Table III.3 shows the pairwise correlations corresponding to the baseline regressions, and Appendix Table III.4 focuses on the pairwise correlations of the institutional variables and the instruments.

Appendix Table III.2 indicates that, for our sample, the choice of scaling variable affects the pairwise correlations of the inflows with the independent variables. This confirms the impression from Figure 5 above, that the picture of the allocation of private capital inflows across sub-Saharan countries is very different whether one looks at overall volume of inflows, or at the size of the inflows relative to a country's population or GDP. Whereas total inflows as a share of population or GDP will be the variable of interest when studying the economic impact of the inflows on individual countries (see Section IV below), the investigation of the factors determining the allocation of private capital flows to sub-Saharan Africa across the

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[9] Unlike many other studies that use the simple average of the four dummy variables or the dummy on capital account restrictions (Alfaro et al. 2005a, 2005b, IMF, 2007b) the Chinn-Ito measure attempts to capture the intensity of the capital controls by incorporating all the restrictions in the index using a principal components approach. Whereas the other restrictions are not directly related to capital account restrictions, they are taken as indicative of the overall restrictiveness of the regime. The advantage of this measure over other, more detailed indices that capture the intensity of capital controls (Quinn, 1997, 2003, Miniane, 2004, Schindler, 2009), is its near universal country and extended time coverage: 181 countries between 1970 and 2005.

continent should focus on the total volume of inflows. A simple explanation is that private investors are more likely to decide on allocating specific amounts of money to various markets or projects, than to fix investment limits relative to a country's population or GDP. Therefore, for the remainder of this section the variable of interest will be the log of private capital inflows and their components, FDI on the one hand and portfolio and debt flows on the other, averaged over 2000-2007 for each sub-Saharan African country excluding Somalia and Zimbabwe.

Looking at the potential determinants of private capital flows to SSA and their composition in Appendix Table III.2 (columns 1-4), overall inflows as well as portfolio and debt inflows are correlated with the index of financial sector development, secondary school enrollment, the market size dummy variable, and the log of initial GDP per capita. There are however interesting variations for the determinants of FDI flows, to which GDP per capita and secondary school enrollment are not significantly correlated, but the proxy for property rights, and the dummy for oil producers are. The measure of trade openness and the Chinn-Ito capital openness variable are never significantly correlated with private inflows or their components. However, capital account openness is correlated with the degree of financial sector development, as in Chinn and Ito (2005), and with secondary school enrollment.

Appendix Table III.3 illustrates the challenges associated with finding truly exogenous determinants of private capital flows and their composition, as a number of potential explanatory variables are correlated with each other. In particular, the measure of financial market development is highly correlated with the proxies for property rights institutions, as discussed above. Further, educational achievement is significantly correlated with the institutional quality variables and economic development. This is not surprising, as it can be understood as an outcome of good institutions and higher degree of economic development. This strong degree of endogeneity and the fact that we are interested in disentangling the impact of institutions on capital inflows argues that, like the variables capturing macroeconomic performance, it is probably not a useful explanatory variable given our focus on the impact of institutions per se on capital inflows. The same holds true for the proxy for economic development, log of GDP per capita in 2000 (Alfaro et al., 2005b, show that log real GDP per capita has no additional explanatory power once a measure of institutional quality is introduced).

The pairwise correlations of the potential instruments—British legal origin, population density in 1500 and ethno linguistic fragmentation—with the institutional variables and with the capital flows variables are encouraging for the instrumental variables approach (Appendix Table III.4). The potential instruments for property rights institutions are uncorrelated with the inflows variables but are significantly correlated with the property rights proxies. Although British legal origin is significantly correlated with total inflows in addition to financial institutions, it is not correlated with property rights nor its potential instruments.

Regression results

Table 3 presents the results of simple OLS estimations of various specifications of equation (1), as a benchmark. The coefficient on the financial market development index is positive and significant, and robust across all specifications. For portfolio and debt flows it is even the only variable that is significant, maybe highlighting the particular importance of capital market development for non-FDI flows. The coefficient on property rights institutions (rule of law score) is never significant and has the wrong sign. The coefficients on the controls for country size and oil exporters are large and generally significant, but, while oil exporters do receive more FDI than other countries, they do not have any particular advantage with portfolio and debt inflows. Real GDP growth is the only other variable that is significant for total inflows and FDI. However, as discussed earlier, real GDP growth is not exogenous, and, to study the impact of institutions further we use the specification in column (3) as our baseline. The log of real GDP per capita in 2000, secondary enrollment, and capital account and trade openness are never significant.[10] The results obtained are similar when breaking the sample into two sub-periods, capturing the period before and after the acceleration of private capital inflows. This is not surprising considering that the determinants of inflows are fairly slowly-moving country characteristics. They are also robust to excluding South Africa and Nigeria, indicating that the results are not driven by the two largest recipients, and to excluding all oil exporters (Results available upon request). Indeed, the impact of financial market development on inflows is even larger in both cases.

Table 3. Baseline OLS Estimation Results

	Total Inflows								FDI Inflows				Portfolio & Debt Inflows			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Financial Institutions	0.50***		0.56***	0.52***	0.55***	0.56***	0.58**	0.56***	0.57***		0.67***	0.63***	0.55***		0.57***	0.55***
	(-3.46)		(5.86)	(5.48)	(5.44)	(5.65)	(5.27)	(6.03)			(5.36)	(4.99)	(3.43)		(3.48)	(3.22)
Rule of Law		-0.21	-0.33	-0.41	-0.27	-0.28	-0.33	-0.37		-0.03	-0.10	-0.20		-0.18	-0.52	-0.58
		(-0.56)	(-1.14)	(-1.36)	(-0.70)	(-0.85)	(-1.12)	(-1.29)		(-0.08)	(-0.25)	(0.52)		(-0.46)	(-1.24)	(-1.31)
South Africa and Nigeria			1.85	1.87*	1.98	1.89	1.79	1.58			1.35	1.37			2.11	2.12
			(1.68)	(1.70)	(1.21)	(1.60)	(1.61)	(1.37)			(1.34)	(1.37)			(1.60)	(1.60)
Oil Exporters			1.61***	1.01*	1.62***	1.68***	1.60***	1.64***			2.67***	1.94***			0.51	0.12
			(3.14)	(1.90)	(3.04)	(2.76)	(3.08)	(3.06)			(4.41)	(3.67)			(0.78)	(0.14)
Real GDP growth				0.11***								0.14***				0.07
				(3.26)								(3.04)				(1.27)
Secondary Enrollment					-0.00											
					(-0.28)											
Log 2000 per capita GDP						-.05										
						(-0.32)										
Capital Account Openness							-0.6									
							(-0.6)									
Trade Openness								-0.01**								
								(-2.02)								
Constant	4.47***	5.22***	3.79***	3.35***	3.92***	4.13***	3.74***	4.41***	3.42***	4.42***	2.68***	2.16***	3.45***	4.30	2.88***	2.60***
	(-12.5)	(23.17)	(11.46)	(9.66)	(8.36)	(3.98)	(10.15)	(8.67)	(7.13)	(19.56)	(6.35)	(4.77)	(9.00)	(13.61)	(4.82)	(4.10)
Observations	43	43	43	43	42	43	43	43	43	43	43	43	43	43	43	43
R-squared	0.26	0.01	0.57	0.62	0.57	0.57	0.58	0.59	0.22	0.00	0.55	0.59	0.25	0.00	0.42	0.44
F-Statistic	11.96	0.31	12.00	15.81	8.78	9.46	9.41	15.32	11.97	0.01	12.89	14.06	11.76	0.21	5.45	4.93

Note: ***,**,and * indicate significant at 1, 5,and 10 percent. t-Statistics are reported in parentheses. Robust standard errors.

Source: Authors' calculations.

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[10] A recent study finds that, as is the case for low-income countries, de jure financial integration is fairly low for sub-Saharan Africa compared to other regions. Capital control regulations tend to be complex and nontransparent, and limited capacity to monitor capital flows can lead to inconsistent implementation. Inconsistencies between different regulations have also made capital controls easy to circumvent. This may explain the difficulties in establishing an empirical relation between capital controls and capital flows in the region (IMF, 2008).

Table 4 presents the results of the 2SLS estimation. The first stage equations are shown in Panel A, and the second stage in Panel B. Columns (1) and (2) report results using Ethno linguistic fractionalization as the instrument for property rights institutions, and columns (3) and (4) using latitude. Given the very low R-squared obtained in the latter case corresponding results are not shown for the components of the inflows.

Starting with the first-stage regressions, British legal origin is shown to have a strong positive and significant impact on financial development, but not on the rule of law, while the instrument for property rights has a stronger and mostly significant impact on property rights (greater ethno linguistic fragmentation has a negative impact on rule of law, as does closeness to the Equator), than on financial institutions. Market size has a positive and significant impact on capital market development, and oil exporting status has a negative and significant impact. However, market size is negatively related to rule of law―although this is likely to be mainly because of the relatively low ratings of Nigeria and South Africa regarding property rights protection. Oil exporting status is also negatively related to rule of law, a result attributed to the rent-seeking culture that appears to take hold in resource-rich countries (Auty, 2001, Auty and Gelb, 2001, Karl, 1999, 1997).

Table 4. Instrumental Variables Estimation Results

	Total Inflows				FDI Inflows		Portfolio Inflows		Share of FDI	
	(1)	(2)	(3)	(4)	(1)	(2)	(1)	(2)	(1)	(2)
Panel A: Second-Stage Regressions										
Financial Institutions										
	0.42**	0.22	0.61**	0.62	0.61***	0.51**	0.32	0.01	0.06	0.11***
	(2.00)	(0.97)	(2.11)	(1.34)	(2.64)	(2.14)	(1.37)	(0.04)	(1.48)	(2.59)
Rule of Law	-1.01	-0.35	-2.25**	-2.31	-0.96	0.25	-0.43	-0.20	-0.09	0.10
	(-0.92)	(-0.28)	(-1.98)	(-1.60)	(-0.82)	(0.20)	(-0.34)	(-0.12)	(-0.47)	-0.41
South Africa and Nigeria		2.77**		0.76		1.96		3.80**		-0.37**
		(2.05)		(0.39)		(1.49)		(2.41)		(-1.95)
Oil Exporters		1.15		0.67		2.65***		-0.60		0.54***
		(1.57)		(0.90		(2.98)		(-0.06)		(3.32)
Constant	3.96***	4.43***	2.75	2.55	2.72***	3.18***	3.59***	4.14***	0.32*	0.30*
	(4.30)	(4.48)	(2.33)	(1.57)	(2.87)	(3.79)	(3.48)	(3.34)	(1.88)	(1.70)
Observations	42	42	43	43	42	42	42	42	42	42
R-squared	0.28	0.47	0.05	0.07	0.25	0.53	0.24	0.24	N.A.	0.12
Panel B: First-Stage Regressions										
	Financial Institutions				**Financial Institutions**		**Financial Institutions**		**Financial Institutions**	
British Legal Origin	1.81***	1.48***	1.88***	1.55***	1.81***	1.48***	1.81***	1.48***	1.81***	1.48***
	(4.08)	(2.91)	(4.19)	(2.95)	(4.08)	(2.91)	(4.08)	(2.91)	(4.08)	(2.91)
Instrument for Rule of Law[1]	0.60	0.69	0.31	0.84	0.60	0.69	0.60	0.69	0.60	0.69
	(0.97)	(1.07)	(0.24)	(0.63)	(0.97)	(1.07)	(0.97)	(1.07)	(0.97)	(1.07)
South Africa and Nigeria		1.45**		1.58***		1.45**		1.45**		1.45**
		(2.60)		(2.95)		(2.60)		(2.60)		(2.60)
Oil Exporters		-0.85**		-0.74*		-0.85**		-0.85**		-0.85**
		(-2.10)		(-1.93)		(-2.10)		(-2.10)		(-2.10)
Constant	0.78*	0.92**	1.06***	1.16***	0.78*	0.92**	0.78*	0.92**	0.78*	0.92**
	(1.88)	(2.29)	(3.94)	(4.23)	(1.88)	(2.29)	(1.88)	(2.29)	(1.88)	(2.29)
Adj. R-squared	0.32	0.34	0.31	0.33	0.32	0.34	0.32	0.34	0.32	0.34
	Rule of Law				**Rule of Law**		**Rule of Law**		**Rule of Law**	
British Legal Origin	0.31	0.34	0.23	0.23	0.31	0.34	0.31	0.34	0.31	0.34
	(1.66)	(1.61)	(1.21)	(1.21)	(1.66)	(1.61)	(1.66)	(1.61)	(1.66)	(1.61)
Instrument for Rule of Law[1]	-0.68**	-0.53	1.43	1.48	-0.68**	-0.53	-0.68**	-0.53	-0.68**	-0.53
	(-2.11)	(-1.57)	(1.22)	(-1.63)	(-2.11)	(-1.57)	(-2.11)	(-1.57)	(-2.11)	(-1.57)
South Africa and Nigeria		-0.65***		-0.58***		-0.65***		-0.65***		-0.65***
		(-3.36)		(-2.78)		(-3.36)		(-3.36)		(-3.36)
Oil Exporters		-0.33*		-0.48**		-0.33*		-0.33*		-0.33*
		(-1.83)		(-2.25)		(-1.83)		(-1.83)		(-1.83)
Constant	-0.36	-0.38	-0.96***	-0.86***	-0.36	-0.38	-0.36	-0.38	-0.36	-0.38
	(-1.50)	(-1.54)	(-5.91)	(-5.14)	(-1.50)	(-1.54)	(-1.50)	(-1.54)	(-1.50)	(-1.54)
Adj. R-squared	0.10	0.17	0.08	0.19	0.10	0.17	0.10	0.17	0.10	0.17

Note: ***,**,and * indicate significant at 1, 5,and 10 percent. t-Statistics are reported in parentheses. Robust standard
[1] In columns (1) and (2) the instrument for rule of law is ethnolinguistic fractionalization. In columns (3) and (4) the instrument is latitude.
Source: Authors' calculations.

Comparing the second-stage equations with the OLS estimates, the impact of financial institutions is overall weaker (smaller coefficients) but remains strong and significant for total inflows and FDI inflows, as well as the share of FDI in total inflows. Interestingly, the property rights variable is never significant and continues to have the "wrong" sign in most cases, except for FDI inflows and the share of FDI (column 2), perhaps indicating that non-FDI investors believe property rights are not critical for their relatively liquid investments. Oil resources is a strong determinant of FDI inflows, but not other types of flows, whereas it is market size that seems to matter for portfolio and debt inflows.

When excluding South Africa and Nigeria, or oil-rich countries, from the estimation, results are broadly similar, with the coefficient on financial institutions larger particularly in the FDI regressions. This indicates that, in non-oil sub-Saharan African countries excluding South Africa, FDI inflows are significantly larger, the more financial markets are developed. Perhaps surprisingly, property rights protection is insignificant. This may be explained by the fact that, as FDI is harder to expropriate, even countries with poor property rights protection receive FDI. Alternatively, for these relatively small countries, it may be possible for foreign investors to effectively negotiate greater property rights for their FDI than is generally available in the country for other investors.

Given the small sample size, the results must be interpreted with caution, but overall they support the importance of unbundling institutions and measuring them more precisely. Results also support the notion that, for capital flows, financial institutions as proxied by capital markets development matter more than basic property rights institutions: capital including in the form of FDI will flow less to countries with less developed financial markets, against the view presented in Albuquerque (2003) that FDI should flow more to financially constrained countries.

IV. DO PRIVATE CAPITAL FLOWS HAVE AN IMPACT ON GROWTH IN SSA?

This section undertakes a preliminary analysis of the relationship between capital inflows and growth in sub-Saharan Africa. Significant capital flows to African countries are a relatively recent phenomenon and, as noted above, have so far been restricted to a limited number of markets. Given the general inconclusiveness of the empirical evidence on the links between growth and capital flows from emerging markets that have been on the radar of international investors much longer than most African markets, it is perhaps too early to expect robust econometric results with the particular sample in this paper.

While it is easy to make a theoretical case for the positive impact of capital flows on growth, the empirical verification of this impact has proved much more challenging.[11] Alternate

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[11] See Edison and others, 2004; Kose and others, 2006; Dell'Aricia and others, 2008; and Prasad, Rajan, and Subramanian, 2007, for comprehensive reviews of the empirical literature on the impact of capital flows. Though evidence from empirical studies using aggregate data is inconclusive, studies that use measures of de facto

(continued…)

explanations to this empirical puzzle have predicated the gains from capital flows on the threshold development of certain domestic institutions, and/or proposed that such flows generate certain indirect or collateral benefits even when their direct impact on growth is difficult to gauge. Klein (2005) finds support for a model in which institutional quality intermediates the impact of capital account liberalization on growth by affecting the extent to which savings are protected from expropriation and the premium borrowers pay for funds from abroad. In countries with better institutions, capital account openness has a significant positive impact on growth. Bekaert, Harvey, and Lundblad (2005) find that the largest growth response to equity market liberalizations accrues to countries with better legal systems, above-average financial development, and better-quality institutions in terms of investor protection and accounting standards. Using industry-level data, Prasad, Rajan, and Subramanian (2007) indicate that for countries that have above-median levels of financial development, foreign capital aids the relative growth of those industries dependent on finance. But for countries below the median for financial development, the effect of foreign capital inflows is diametrically opposite. Using firm-level data, Alfaro and Charlton (2007) find a significant relationship between entrepreneurial activity and both de jure and de facto international capital integration. Their results suggest that foreign capital may improve access to capital either directly or through improved domestic financial intermediation

Recent evidence, however, indicates that countries that grow more rapidly are those that rely less and not more on foreign capital, and in turn foreign capital tends to flow to countries that experience not high, but low productivity growth (Prasad, Rajan and Subramanian (2007) ; Gourinchas and Jeanne (2007)). One possible explanation for this puzzle is trade: fast-growing countries also are the ones that experienced a takeoff in their export sector (Gourinchas and Jeanne, 2007). If capital inflows lead to higher prices for nontraded goods owing to absorptive capacity constraints, and thus to overvaluation, they will have a negative impact on exports and hence growth (Kose and others, 2006; Prasad, Rajan, and Subramanian, 2007). Another explanation is that inflows from abroad that supplement domestic savings will have a limited impact in an economy where the binding constraint is the scarcity of viable investment opportunities (Rodrik and Subramanian, 2009).

We estimate the gains from financial globalization using the same cross-section sample of average flows for the 2000-07 period as in the preceding section. However, in this section we also make use of data on net flows. For most African countries the differences between net and total capital flows are not often vast, nevertheless the economic impact of such flows depends on the actual infusion of foreign capital rather than gross flows. Also, we scale net flows to the size of the economy by alternatively dividing them by population or GDP.

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integration or finer measures of de jure integration tend to find more positive results. Studies using micro data are also better able to find growth and productivity gains from financial integration.

A. Correlation Analysis

We begin the correlation analysis with a simple mapping between economic growth and capital flows in sub-Saharan Africa, while not drawing any inferences about the direction of causation. [12] The scatter plots indicate a generally positive correlation between growth and capital flows in our sample. [13] Consistent with the findings in the literature, the relationship is more pronounced when only FDI flows are considered.

Figure 7. Sub-Saharan Africa: Capital Flows and Real GDP Growth
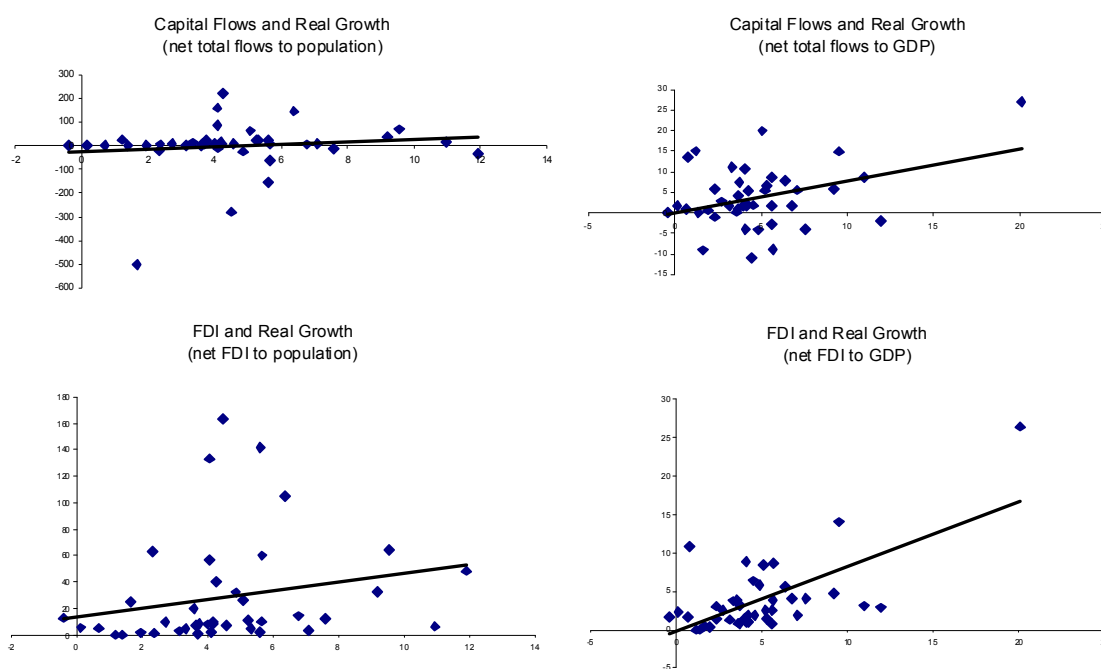
Note: All variables are the average value of the 2000-07 period. Where normalized over population the charts exclude the outliers Equatorial Guinea and Seychelles.

Table 5 provides further evidence of the positive, significant correlation between capital flows to sub-Saharan Africa and real GDP growth in the recipient countries. This relationship however does not hold when capital flows are disaggregated—while FDI is positively correlated with growth, portfolio and debt-creating flows are generally inversely related to growth, though

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[12] As mentioned in the previous section in analyzing the relationship between growth and capital flows the latter are normalized over either the population or GDP of the recipient country. All variables are considered at their average values over the 2000-07 period to deal with annual volatility.

[13] This is in contrast with Rodrick and Subramanian (2008), who in a sample of 110 developing countries running through 2004 do not find any relationship between financial globalization (measured as the sum of foreign assets and liabilities, as a share of GDP) and growth.

not significantly so. This finding is also consistent with evidence from other studies(Dell'Aricia and others, 2008)

Table 5. Correlations: Net Capital Flows and Real Growth

	Real GDP Growth	Net Total Flows/GDP	FDI Flows/GDP	Debt Flows/GDP	Portfolio Flows/GDP
Real GDP Growth	1.00				
Net Total Flows/GDP	0.38*	1.00			
FDI Flows/GDP	0.66*	0.54*	1.00		
Debt Flows/GDP	-0.02	0.72*	-0.07	1.00	
Portfolio Flows/GDP	-0.06	0.31*	-0.10	0.02	1.00

	Real GDP Growth	Net Total Flows per capita	FDI Flows per capita	Debt Flows per capita	Portfolio Flows per capita
Real GDP Growth	1.00				
Net Total Flows per capita	0.37*	1.00			
FDI Flows per capita	0.44*	0.89*	1.00		
Debt Flows per capita	0.08	0.53*	0.22	1.00	
Portfolio Flows per capita	-0.07	0.25	-0.01	-0.06	1.00

Note: * indicates significant at 10 percent.
Source: Authors' calculations.

B. Testing channels of transmission of private capital flows on growth

Another approach to gauging the likely impact on capital inflows on growth is to test the various channels described in the literature on financial globalization and growth. Three broad channels are identified as linking capital inflows and growth:

- Overvaluation: to the extent that capital inflows cause currency appreciation they hurt exports and thus dampen growth. This channel is well-documented in Rodrick (2007), but also discussed in Prasad et al. (2007).

- Savings and investment: where foreign capital supplements domestic savings it fosters growth. However, this would only be true for economies where the main constraint on growth is a lack of savings. Where the main hindrance to economic growth is the scarcity of viable investment opportunities additional foreign capital will only add to domestic distortions (Gourinchas and Jeanne, 2007; Rodrick and Subramanian, 2009).

- Institutional development: a number of studies argue that capital inflows carry indirect (collateral) benefits for recipient countries via the development of domestic institutions (Becker and others, 2007; Kose and others, 2006), or more particularly financial sector institutions (Mishkin, 2006).

The testing methodology employed here utilizes correlations as well, via bivariate regressions. In the first stage, the bivariate model regresses capital flows on the channel of interest. If the first stage results indicate that the channel is significantly correlated with capital flows then in the second stage, the model regresses the predicted value of the channel

from the first regression, i.e. that part of the channel variable correlated with capital flows on growth. If the coefficient in the second regression is significant and with the expected sign, it implies that the channel is likely to be operational for this particular sample of countries. Evidence that a particular channel could be at work is not sufficient to demonstrate the impact of private capital flows on growth, but it is a necessary first step.

Thus,

$$Y_i = \alpha_1 + \beta \cdot K_i + u_1 \qquad (1)$$

$$g_i = \alpha_2 + \eta \cdot \hat{Y}_i + u_2 \qquad (2)$$

Where Y_i is the channel variable of interest, K_i are capital flows normalized over GDP or population, g_i is the real GDP growth rate and $\hat{Y}i$ is the predicted value of the channel variable of interest derived from the first regression. All variables are in their level values so that sign and significance of β and η are of greater interest than their magnitude. The results are presented in Table 6 below.

Table 6. Channels of Transmission Between Capital Flows and Growth

	Overvaluation	Investment	Domestic Savings	Institutions
Net flows/GDP	-0.004	0.164	0.337	-0.214
Net flows per capita	-0.00003	0.012 ***	0.021 **	-0.0042

Note: *** and ** indicate significant at 1 and 5 percent, respectivelly.
Source: Authors' calculations.

The findings indicate that in most instances capital flows are not significantly correlated with the channel variables in our sample. Except when capital flows are scaled to the size of the recipient country's population — both savings and investment are positively and significantly related to capital flows in this instance.[14] This implies that, for SSA countries, the impact of private capital flows on growth could be partly intermediated through the impact of net capital flows on domestic savings and investment. Another implication would also be that African economies are not necessarily investment-constrained.[15]

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[14] As expected the impact of the predicted values of investment and domestic savings in the second stage regressions is positive.

[15] Rodrik and Subramanian (2009) define an economy to be savings-constrained when private investment is low despite the existence of many privately profitable projects because credit is either not available or too costly, and to be investment-constrained when credit is available but there is a lack of profitable investment opportunities (p.12). In savings-constrained economies foreign capital will supplement scarce domestic savings (evidenced by high real interest rates) and lead to increased investment. In investment-constrained economies , real interest rates will be low and additional capital flows will finance consumption rather than investment.

In an unexpected outcome the institutional variable is negatively related to growth, a result that holds even when oil-exporters are excluded from the sample (not shown).

C. How do Private Capital Flows Affect Growth?

Going beyond bivariate correlations, we first present a simple cross-country multivariate regression model, making use of a averages for the 2000-07 period. [16] Although this method is not without shortcomings, the limited time coverage of our dataset and year-on-year volatility dampens the usefulness of panel estimation. However , our analysis is subject to the considerable limitations of the ordinary least squares estimator in growth models — especially those arising from endogenous variables.

We fit a simple ordinary least squares specification to estimate the relationship between capital flows and growth.

$$g_i = \alpha + \beta \cdot K_i + \eta \cdot X_i + u_i$$

Where g_i is real GDP growth, K_i are capital flows normalized over GDP or population, X_i is a set of control variables, and u_i is an independent error term.

In our choice of control variables we are guided by the "channels" analysis from the preceding section, since our interest in primarily in the impact of capital flows on growth. Thus, our multivariate model is essentially a simultaneous test of the correlations between of the various channel variables, (plus capital flows directly), and growth. As discussed above, other factors shown in the literature on financial globalization to influence growth include savings and investment, exchange rate overvaluation, and institutions. The exchange rate overvaluation measure is constructed as the ratio of the nominal exchange rate to the purchasing power parity exchange rate.[17] The measure of institutions used here is the number of procedures to enforce a contract (Contracts) from the World Bank's Doing Business database. We also control for level of economic development by including the log of initial per capita real GDP growth. The results are documented in Table 7.

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[16] See Appendix Table IV.1 and Appendix Table IV.2 for summary statistics and correlations for the variables included here.

[17] More precisely, the variable is the residual of a simple panel regression between the nominal exchange rate (local currency per US dollar) versus the PPP valuation of the exchange rate. The regression was run for all countries in the world, and the variable is normalized to be 1 for the world as a whole.

Table 7. Estimation Results: Linear Growth Model with Capital Flows

	[1]	[2]	[3]	[4]
Initial per capita GDP (log)	-1.53***	-1.86***	-1.67***	-2.16***
	(-3.11)	(-4.03)	(-3.62)	(-4.15)
Overvaluation	-0.82	-1.53	-0.68	-1.25
	(-0.45)	(-0.84)	(-0.38)	(-0.68)
Domestic savings	0.09***	0.10***	0.09***	0.10***
	(3.39)	(3.59)	(3.61)	(3.62)
Investment	0.18***	0.16***	0.15***	0.17***
	(3.33)	(2.93)	(2.58)	(2.97)
Contract enforcement	0.11	0.09	0.09	0.08
	(1.64)	(1.42)	(1.53)	(1.23)
Net total flows/GDP	0.11*			
	-1.94			
Net total flows per capita		0.003**		
		2.05		
Total inflows/GDP			0.18***	
			(2.27)	
Total inflows per capita				0.003
				(1.47)
Constant	-1.06	4.12	0.54	6.29
	(-0.13)	(0.54)	(0.07)	(0.80)
Adjusted R^2	0.51	0.52	0.53	0.57
Number of observations	42	42	42	42

Note: ***, ** and * indicate significant at 1, 5 and 10 percent, respectivelly. t-statistics in parenthesis.

The results indicate that capital flows are positively and significantly (in all but one instance) associated with growth. Initial per capita GDP comes in with a negative and significant coefficient in all specifications indicating support for growth convergence. Domestic savings and investment are the other significant right-hand side variables that also come in with the expected sign. Contract enforcement, the proxy for institutional development, is not significant in any of the specifications. Overvaluation has the expected sign but is never significant. Estimating the equation with measures of net FDI instead of total net private capital yields similar results, with an even stronger association between the FDI variable and growth.

Aside from the positive correlations and partial evidence of a possible through the savings-investment channel, our analysis is rendered incomplete by the short time period since these inflows began. While the limited number of observations in our sample required us to focus on average growth and inflows over the period 2000-2007, most of the inflows came late in this period. This is an issue which requires further study, as additional observations (years) become available. As described in Section II, the observed rise in private capital flows and growth during the sample period is an important necessary condition, in particular because other studies even fail to uncover such an association for different country groups and/or sample periods. However, it is also far from sufficient for making inferences about causality.

V. CONCLUSION

As a result of the global financial crisis and recession, private capital flows to all regions of the world have declined. Even when the international economy recovers and financial markets return to health, it is likely that investors will remain, for some time, more risk-averse than they were previously. At the same time, donor flows to low-income countries, including those in sub-Saharan Africa, are likely to be adversely impacted by these global developments.

Our results were inconclusive regarding the impact of private capital flows on growth in SSA countries. Additional research will be needed before a definitive statement can be made in this regard, once additional observations are available. However, most SSA countries are likely to remain dependant on financial inflows in some form to help finance current account deficits—deficits that will be the counterpart of development-oriented investments in these economies. As donor flows are likely to be restricted in the coming years, due to the fiscal problems the traditional donor countries find themselves confronting, SSA countries will need private capital flows to finance these current account deficits. The alternative would require smaller or no current account deficits, meaning reduced development-oriented investments in infrastructure and other key areas, with adverse consequences for growth potential.

All this means that policy makers in SSA will need to pay increasing attention to efforts to attract private capital to their countries. Our results indicate that one of the most important things policy makers can do to attract private capital is to strengthen domestic capital markets. Deep and well-functioning money, foreign exchange, equity and (where relevant) derivative markets are key to attracting private capital. Governments in SSA countries would be well-advised to redouble their efforts to develop and strengthen these markets, to put their countries in a position to attract private capital in the future. At the same time, an important of the current financial crisis should also be to put in place strong monitoring, regulatory and supervisory frameworks, to avoid a buildup of balance-sheet vulnerabilities.

Appendix I. Capital Flows Data

The information on private capital flows is based on detailed balance of payments data obtained from AFR country desk economists in late 2007 for 44 sub-Saharan African countries. Data for 2000-2006 are actual, and data for 2007 are preliminary estimates. The data distinguishes between FDI, portfolio (debt and equity) and private debt-creating flows, and between inflows and outflows. The definition of capital inflows adopted for this study differs from other papers using balance of payments data as a measure of capital flows (see Appendix Box I.1 for precise definitions used in the paper).

Appendix Box I.1 Balance of payments recording of capital flows

From the perspective of the financial account one usually thinks of changes in liabilities as positive (inflows) and changes in assets as negative (outflows). In practice, both changes in liabilities and assets are reported as net of any disinvestment and consequently both can have any sign. In the BOP accounts, an increase (decrease) in liabilities to nonresidents is entered as positive (negative) while an increase (decrease) in net foreign assets held by residents is entered as negative (positive). If a resident sells an asset held abroad the transaction is recorded as a reduction in net foreign assets held by residents, bringing an inflow of capital. For this study, capital inflows (outflows) are taken to be the sum of increases (decreases) in liabilities to non-residents and of decreases (increases) in net foreign assets held by residents in a year. This allows to capture all transactions that give rise to a inflow of capital into a country on the liability and asset side, and avoids negative "inflows". Net flows of capital are calculated as the sum of the inflows (positive sign) and outflows (negative sign).

This data differs from other, published data sources with respect to its timeliness, coverage, and level of detail:

- The 2000-2007 period covers the most recent episode of private capital inflows to sub-Saharan Africa, which took off around 2005-2006.

- It covers 43 sub-Saharan African countries.

- It allows to distinguish between different types of private capital flows (FDI, portfolio flows and debt-creating flows). In contrast with other studies (e.g. Faria and Mauro, 2004) that add together FDI and portfolio equity flows, we keep them separate and group portfolio debt and equity (either category is too small to stand on its own). We are interested in the determinants of various types of flows, particularly as regards the development of financial markets, and straight FDI doesn't require any particular type of financial market infrastructure. However, portfolio debt and equity investment require the existence of bond and equity markets.

Other data sources that cover all sub-Saharan African countries include the IMF's WEO, IFS, Balance of payments data, and the World Bank's global development finance data. Another

widely used data base is the Lane-Milesi-Ferretti data, but the most recent updated version goes until 2005, and covers only a sub-set SSA countries. Another group of studies use current account data as a proxy for capital flows (Prasad et al., 2007; Gourinchas and Jeanne, 2007) – which have the advantage of providing wide coverage in terms of years and countries but make it impossible to disaggregate between official and private, transfers and different types of capital flows.

The Fund's World Economic Outlook (WEO) database and the World Bank's Global Development Finance (GDF) database provide the most comprehensive coverage of capital flows to sub-Saharan countries. These data sets have few missing countries and few missing observations for the countries that are in the data sets. However, the comprehensiveness of the WEO and the GDF databases is achieved at a price as each data set relies on Fund and Bank staff estimates to fill in the lacunae left from official statistics (Dorsey et al., 2008).

Other data sets, such as the Fund's *International Financial Statistics* and *the Balance of Payments Statistics* databases rely on official reporting without the use of staff estimates to fill in the gaps. The more detailed and comprehensive coverage of the international transactions at the country level is available in the *Balance of Payment Statistics,* published once a year by the IMF. Although information for most of the sub-Saharan African countries is included in the publication, the most recent database shows a complete set of annual data for just 18 out of 44 countries in the region, mostly the middle-income countries, two oil-exporters and the largest low-income economies among them. The other countries have missing data either for the capital flows components or some years, specially at the end of the period covered in the study, which is crucial for the econometric analysis. The work of the country desk economists was essentially to make sure that all series were available and the components were consistent with the main aggregates. We checked also consistency across the different published databases, finding discrepancies mostly in the last few years of the sample and few revisions to historical numbers in the early 2000's for the countries with data in the various publications.

Looking into the World Economic Outlook database, there is a full coverage of the countries in the region, but it is difficult to separate actual figures from the forecasted ones or estimates (specially for countries with lags in reporting official data from the authorities) and programs with the Fund requiring accurate estimates on the missing BOP data, embedded in the Program. We used the WEO data, which are also reported by country desk economist in the Fund, as a starting point, and asked the desk economists to look into the details and components that are normally not used in the aggregated analysis of the external accounts offered in the WEO studies and data.

In brief, we have not created a separate database but rather taken the available information and refined it in a way that allows us to cover as many countries in the region as possible, regardless of the size of the country and the level of development, weighing properly in the model those countries with no capital flows (reporting zeros) and including those null figures as information in the dependent variable.

Appendix II. Variables Definitions and Sources

Appendix II. Variables Definitions and Sources

Variable	Description	Units	Source
Net total flows	FDI, portfolio and debt net flows. See below	Billions of US$	IMF, African Department database.
Net FDI	Net foreign direct investment flows (FDI in the reporting economy, net of direct investment abroad)	Billions of US$	IMF, African Department database.
Net portfolio and debt flows	Net private portfolio investment and other private flows. Includes equity and debt securities, as well as all other net private debt creating flows.	Billions of US$	IMF, African Department database.
Total Inflows	FDI, portfolio and debt inflows. See below	Billions of US$	IMF, African Department database.
FDI Inflows	Foreign direct investment in the reporting economy.	Billions of US$	IMF, African Department database.
Portfolio and debt inflows	Portfolio investment liabilities, including equity and debt securities liabilities, plus other private capital inflows. Includes all other private debt creating flows (Liabilities, excludes monetary authorities and government).	Billions of US$	IMF, African Department database.
CPIA	Country Policy and Institutional Assessment. Composite index based on sixteen criteria, grouped in four categories: (i) economic management; (ii) structural policies; (iii) policies for social inclusion and equity; and (iv) public sector management and institutions.	1 to 7	World Bank
Financial Institutions	Index of capital markets development, defined as the sum of four dummy variables: Treasury bills, treasury bonds, corporate bonds and equity markets exist.	0, 1 ,2 ,3 ,4, with 0 for countries without any market, to 4 for countries with all four markets present.	Lukonga (forthcoming) and authors' calculations.
Rule of law	"The extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence". One of the six components of the Governance Indicators.	-2.5 (lower score) to 2.5 for the highest score.	http://info.worldbank.org/governance/wgi/index.asp
South Africa and Nigeria	Dummy variable. 1 for South Africa and Nigeria, 0 otherwise	0, 1	Authors' calculations
Oil exporters	Dummy variable. 1 for Angola, Cameroon, Chad, Congo, Rep. of, Equatorial Guinea, Gabon and Nigeria, 0 otherwise.	0, 1	IMF, African Department database.
Real GDP growth	Real GDP growth. Calculated as the percent change of the constant Gross domestic product in 2000 local currency units. Measure of quality of macroeconomic policies.	Percent	IMF, World Economic Outlook
Secondary enrollment	Total enrolment in secondary level of education, regardless of age, expressed as a percentage of the population in the official age group corresponding to this level of education.	Percent	World Bank, World Development Indicators
2000 per capita GDP	Per capita GDP in constant US dollar, for the year 2000.	Constant 2000 US dollars	IMF, World Economic Outlook
Capital account openness	De jure capital account openness index, as the simple average of four dummy variables, representing exchange rate arrangements, payments restrictions on current and capital transactions, and	Index	Chinn-Ito, forthcoming
Trade openness	Sum of exports and imports of goods and non-factor services over GDP.	Percent of GDP	IMF, World Economic Outlook
British legal origin	Dummy variable that takes the value 1 for former British colonies, and 0 otherwise.	0, 1	La Porta et al. (1999)
Ethno linguistic fragmentation	Average value of five different indices of ethno linguistic fractionalization	Index	La Porta et al. (1999)
Latitude	Measure of the closeness to the equator	Miles	La Porta et al. (1999)

Appendix II. Variables Definitions and Sources (Cont.d)

Overvaluation	Residual of a simple panel regression between the nominal exchange rate (local currency per US dollar) Vs. the PPP valuation of the exchange rate. The regression includes 182 countries. The overvaluation measure in normalized to be 1 for the world.	Deviation from "equilibrium" between PPP and market rate, with 1 defined as the norm.	IMF, African Department database.
GDP in dollars	GDP in dollars (Converted at the nominal market exchange rate)	Billions of US$	IMF, World Economic Outlook
Per capita GDP in dollars	Per capita GDP (constant 2000 US dollar)	Constant 2000 US dollars	IMF, World Economic Outlook
Inflation	Headline consumer price index (Average annual percent change)	Percent	IMF, World Economic Outlook
Government balance	General government balance, excluding grants	Percent of GDP	IMF, World Economic Outlook
Credit	Total credit to the private sector in percent of GDP	Percent of GDP	IMF, International Financial Statistics
Current account	Current account balance, excluding grants	Percent of GDP	IMF, African Department database.
REER	Real effective exchange rate, weighted index using total trade (exports and imports composition for 1999 to 2001) and consumer price indices	Percent	IMF, Information Notice System
NEER	Nominal effective exchange rate, weighted index using total trade (exports and imports composition for 1999 to 2001)		IMF, Information Notice System
U.S. Tbill rate	United States Treasury bill rate	Percent	IMF, International Financial Statistics
Terms of trade	Terms of trade (Exports prices to import prices, goods and services)	Percent	IMF, World Economic Outlook
Rest of the world real GDP	Rest of the world real GDP growth (Weighted by country exports)	Percent	IMF, World Economic Outlook
Oil prices	Price of oil. Simple average of Texas, Dubai and Brent prices, deflated by the manufacturing unit cost index	Percent	IMF, World Economic Outlook
Domestic savings	Total domestic savings	Percent of GDP	IMF, World Economic Outlook
Investment	Total private investment	Percent of GDP	IMF, World Economic Outlook
Reserves	Stock of international reserves (US dollar, billions)	Billions of US$	IMF, World Economic Outlook
Non-fuel commodity prices	Real non-fuel commodity price (Weighted by country specific exports, deflated by the manufacturing unit price)	Percent	IMF, World Economic Outlook
Population	Population	Millions	IMF, World Economic Outlook
Contract enforcement	"Efficiency of contract enforcement by following the evolution of a sale of goods dispute and tracking the time, cost, and number of procedures involved from the moment the plaintiff files the lawsuit until actual payment".	Number of procedures	http://www.doingbusiness.org/
Constraint on the executive	Index that ranks from 1 (unlimited authority to the executive), to 7 (Executive parity or subordination), as decribed in the Freedom House Index.	1 to 7	http://www.freedomhose.org/ and Polity IV Databse at www.systemicpeace.org/ polity/polity4.htm
ICRG ranking	International Country Risk Guide rank for each country is based on three components of risk analysis: Political, financial and economic components. The higher the rating the lower the risk for that particular country. The index covers 140 countries.	0 to 100	www.prsgroup.com

Appendix III. Determinants of Capital Flows: Descriptive Statistics and Correlations

Appendix Table III.1. Descriptive Statistics for Regression Variables

1. Dependent variables	Observations	Minimum	Maximum	Mean	Median	Standard Deviation
Total inflows	43	6.3	16,210.6	826.5	233.9	2,541.0
FDI inflows	43	0.0	4,237.1	359.8	90.9	802.7
Portfolio and debt inflows	43	0.0	13,072.4	466.6	102.1	1,978.6
Total inflows per capita	43	3.5	1,625.0	129.1	25.5	307.8
FDI inflows per capita	43	0.0	1,165.3	82.6	10.5	232.5
Portfolio and debt inflows p.c.	43	0.0	590.6	46.5	14.7	103.8
Total inflows to GDP	43	1.1	30.7	8.1	6.2	6.5
FDI inflows to GDP	43	0.0	29.0	4.2	2.4	5.3
Portfolio and debt inflows to GDP	43	0.0	18.7	3.9	3.2	3.6
2. Explanatory variables						
Financial institutions	43	0.0	4.0	1.8	1.0	1.6
Rule of law	43	-1.8	0.8	-0.7	-0.7	0.6
Market size	43	0.0	1.0	0.0	0.0	0.2
Oil exporter	43	0.0	1.0	0.2	0.0	0.4
Real GDP growth	43	-0.4	20.1	4.8	4.2	3.6
Secondary enrollment	42	8.2	107.9	34.2	28.3	22.6
Log of 2000 GDP per capita	43	4.5	9.0	6.1	5.8	1.1
Capital account openness	43	-1.6	2.5	-0.5	-1.1	1.3
Trade openness	43	36.9	155.9	81.8	78.9	30.4
3. Alternative measures of institutions and instruments						
CPIA	42	1.8	4.3	3.2	3.2	0.6
Doing Business Index	43	30.3	176.0	132.1	148.7	41.0
ICRG ranking	28	48.3	80.8	61.4	60.5	7.3
Legal rights	43	1.0	8.0	4.0	3.5	1.6
Property rights	41	1.4	4.5	3.0	3.0	0.6
Constraint on the executive	40	1.7	7.0	4.1	4.3	1.6
British legal origin	43	0.0	1.0	0.3	0.0	0.5
Ethnolinguistic fragmentation	42	0.0	1.0	0.6	0.7	0.3
Population density in 1500	36	0.1	25.0	3.8	2.0	5.5
Latitude	43	0.0	0.7	0.1	0.1	0.1

Source: Authors' calculations.

Appendix Table III.2. Bivariate Correlations of Capital Flows with Independent Variables

	Total inflows	FDI inflows (US$ mn)	Portf. & debt	Share of FDI	Total inflows	FDI inflows (per capita)	Portf. & debt	Total inflows	FDI inflows (in percent of GDP)	Portf. & debt
Financial Institutions	0.31	0.33	0.26	0.08	0.02	-0.05	0.19	-0.12	-0.11	-0.06
	0.04	0.03	0.09	0.62	0.88	0.74	0.22	0.44	0.50	0.70
Rule of Law	-0.21	-0.29	-0.15	0.03	0.13	0.05	0.27	-0.07	-0.09	0.00
	0.18	0.06	0.34	0.83	0.42	0.77	0.07	0.65	0.58	0.99
Market size	0.87	0.93	0.74	0.00	0.05	-0.03	0.21	-0.06	-0.04	-0.05
	0.00	0.00	0.00	0.99	0.77	0.84	0.19	0.69	0.79	0.74
Oil exporter	0.10	0.43	-0.04	0.45	0.19	0.27	-0.05	0.34	0.54	-0.19
	0.52	0.00	0.78	0.00	0.23	0.08	0.75	0.03	0.00	0.22
Real GDP growth	0.12	0.39	0.00	0.34	0.28	0.41	-0.10	0.55	0.70	-0.05
	0.43	0.01	0.99	0.03	0.07	0.01	0.52	0.00	0.00	0.77
Secondary enrollment	0.36	0.19	0.39	0.03	0.60	0.44	0.81	0.09	0.11	0.00
	0.02	0.23	0.01	0.83	0.00	0.00	0.00	0.57	0.50	0.99
Log 2000 GDP per capita	0.27	0.20	0.26	0.27	0.63	0.52	0.70	0.11	0.26	-0.20
	0.08	0.19	0.09	0.08	0.00	0.00	0.00	0.49	0.09	0.20
Capital account openness	-0.07	-0.05	-0.07	-0.04	0.12	0.06	0.22	0.07	0.01	0.11
	0.66	0.73	0.68	0.79	0.46	0.72	0.16	0.66	0.94	0.49
Trade openness	-0.17	-0.17	-0.15	0.11	0.14	0.15	0.08	0.13	0.17	-0.03
	0.27	0.27	0.34	0.50	0.36	0.33	0.59	0.42	0.27	0.86
UKleg	0.27	0.28	0.23	0.16	-0.10	-0.11	-0.05	-0.10	-0.04	-0.11
	0.08	0.07	0.14	0.31	0.52	0.48	0.76	0.53	0.78	0.47
Ethling	0.15	0.21	0.11	0.12	0.06	0.04	0.09	-0.05	0.01	-0.10
	0.33	0.18	0.48	0.44	0.69	0.80	0.55	0.77	0.94	0.53
LAT	-0.11	-0.12	-0.09	0.39	-0.04	-0.06	0.02	-0.15	-0.05	-0.20
	0.50	0.46	0.57	0.01	0.80	0.68	0.88	0.32	0.73	0.20
Pop_dens	0.00	-0.03	0.02	-0.47	-0.04	-0.05	-0.02	0.04	-0.23	0.37
	0.99	0.85	0.93	0.00	0.80	0.75	0.89	0.81	0.18	0.03

Note: pairwise correlation coefficient reported in first row, significance level reported in second row.
Source: Authors' calculations.

Appendix Table III.3. Bivariate Correlations of Baseline Regression Variables

	Fin. Instit.	Rule of Law	Market size	Oil exporter	Real GDP growth	Second. Enr.	Log 2000 GDP p.c.	Capital open.	Trade open.
Total inflows									
Financial Institutions	1.00								
Rule of Law	0.42	1.00							
	0.00								
Market size	0.32	-0.23	1.00						
	0.04	0.15							
Oil exporter	-0.22	-0.34	0.20	1.00					
	0.16	0.02	0.19						
Real GDP growth	0.08	0.01	0.12	0.47	1.00				
	0.60	0.95	0.44	0.00					
Secondary enrollment	0.40	0.49	0.27	-0.08	-0.12	1.00			
	0.01	0.00	0.08	0.63	0.44				
Log 2000 GDP per capita	0.34	0.39	0.18	0.24	0.00	0.83	1.00		
	0.02	0.01	0.25	0.12	0.98	0.00			
Capital account openness	0.34	0.19	-0.06	-0.20	-0.05	0.31	0.20	1.00	
	0.03	0.21	0.71	0.21	0.74	0.05	0.30		
Trade openness	-0.15	-0.08	-0.22	0.03	-0.10	0.08	0.10	-0.01	1.00
	0.35	0.61	0.17	0.85	0.54	0.61	0.60	0.96	

Note: Pairwise correlation coefficients reported in first row, significance level reported below.
Source: Authors' calculations.

Appendix Table III.4. Bivariate Correlations of Measures of Institutions and Instruments

	Financial inst.	CPIA index	Doing Business	ICRG ranking	Legal rights	Rule of law	Property rights	Constraint on the executive	British legal origen	Ethnoling. fragmentation	Latitude	Population density
Financial institutions	1.00											
	43.00											
CPIA index	0.63	1.00										
	0.00											
	42.00	42.00										
Doing Business index	-0.60	-0.44	1.00									
	0.00	0.00										
	43.00	42.00	43.00									
ICRG ranking	0.29	0.40	-0.69	1.00								
	0.13	0.03	0.00									
	28.00	28.00	28.00	28.00								
Legal rights	0.61	0.46	-0.61	0.20	1.00							
	0.00	0.00	0.00	0.30								
	43.00	42.00	43.00	28.00	43.00							
Rule of Law	0.42	0.63	-0.69	0.82	0.34	1.00						
	0.00	0.00	0.00	0.00	0.03							
	43.00	42.00	43.00	28.00	43.00	43.00						
Property rights	0.57	0.81	-0.64	0.70	0.46	0.81	1.00					
	0.00	0.00	0.00	0.00	0.00	0.00						
	41.00	41.00	41.00	27.00	41.00	41.00	41.00					
Constraint on the executive	0.44	0.41	-0.51	0.16	0.42	0.49	0.55	1.00				
	0.00	0.01	0.00	0.43	0.01	0.00	0.00					
	40.00	39.00	40.00	28.00	40.00	40.00	38.00	40.00				
British legal origin	0.59	0.40	-0.55	0.31	0.69	0.21	0.36	0.28	1.00			
	0.00	0.01	0.00	0.11	0.00	0.18	0.02	0.08				
	43.00	42.00	43.00	28.00	43.00	43.00	41.00	40.00	43.00			
Ethnolinguistic fragmentation	0.17	-0.15	0.05	-0.32	0.14	-0.29	-0.18	0.02	0.11	1.00		
	0.27	0.36	0.74	0.10	0.38	0.06	0.28	0.93	0.50			
	42.00	41.00	42.00	28.00	42.00	42.00	40.00	39.00	42.00	42.00		
Latitude	0.09	0.16	-0.28	0.37	0.13	0.30	0.29	0.19	0.11	0.01	1.00	
	0.58	0.32	0.07	0.06	0.41	0.05	0.07	0.25	0.49	0.94		
	43.00	42.00	43.00	28.00	43.00	43.00	41.00	40.00	43.00	42.00	43.00	
Population density	-0.14	-0.02	0.21	-0.25	-0.45	-0.23	-0.11	-0.18	-0.18	-0.43	-0.37	1.00
	0.42	0.90	0.22	0.22	0.01	0.17	0.52	0.31	0.28	0.01	0.03	
	36.00	36.00	36.00	25.00	36.00	36.00	36.00	35.00	36.00	35.00	36.00	36.00

Note: Pairwise correlation coefficients reported in first row, significance level reported in the second row and number of observation in the third row.
Source: Authors' calculations.

Appendix IV. Private Capital Flows and Growth

Appendix Table IV.1 Private Capital Flows and Growth: Summary Statistics for Multivariate Regression

Variable	Number of observations	Mean	Standard deviation	Min	Max
Real GDP growth	43	4.8	3.6	-0.4	20.1
Initial per capita GDP	43	6.1	1.1	4.5	9.0
Net total flows/GDP	43	3.7	7.4	-10.9	27.1
Net total flows per capita	43	54.7	278.2	-500.6	1232.3
Total inflows/GDP	43	7.7	5.7	1.0	28.2
Total inflows per capita	43	131.1	313.9	3.5	1645.0
Overvaluation	43	1.1	0.3	0.7	1.7
Domestic savings	42	12.2	20.0	-24.7	81.3
Investment	42	21.6	8.7	8.7	46.9
Contract enforcement	43	101.4	6.6	82.6	113.3

Source: Authors' calculations.

Appendix Table IV.2 Private Capital Flows and Growth: Pairwise Correlations for Multivariate Regression

	Real GDP growth	Initial per capita GDP	Netflows/GDP	Netflows per capita	Inflows/GDP	Inflows per capita	Overvaluation	Domestic savings	Investment	Contract enforcement
Real GDP growth	1.00									
Initial per capita GDP	0.00	1.00								
Netflows/GDP	0.38 *	-0.13	1.00							
Netflows per capita	0.37 *	0.28 *	0.67 *	1.00						
Inflows/GDP	0.49 *	0.16	0.76 *	0.66 *	1.00					
Inflows per capita	0.28 *	0.63 *	0.42 *	0.87 *	0.61 *	1.00				
Overvaluation	-0.32 *	-0.21	-0.11	-0.03	-0.24	-0.16	1.00			
Domestic savings	0.48 *	0.58 *	0.13	0.29 *	0.28 *	0.48 *	-0.36 *	1.00		
Investment	0.45 *	0.45 *	0.14	0.39 *	0.45 *	0.51 *	-0.26 *	0.42 *	1.00	
Contract enforcement	0.18	-0.07	-0.24	-0.18	-0.17	-0.13	-0.15	0.10	-0.12	1.00

Note: * indicates significant at 10 percent.
Source: Authors' calculations.

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