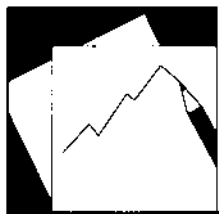


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Credit Growth in Sub-Saharan Africa— Sources, Risks, and Policy Responses

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IMF Working Paper

African Department

Credit Growth in Sub-Saharan Africa—Sources, Risks, and Policy Responses

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Authorized for distribution by John Wakeman-Linn

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Abstract

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In this paper, we analyze credit growth in Sub-Saharan Africa over the past decade focusing on the post-2002 rapid credit growth in select countries. We develop regression models of the fundamental determinants of bank credit and use them to examine whether they can fully explain developments in rapid credit growth countries. We then argue that rapid credit expansion, whether a manifestation of a credit boom or driven by fundamentals, can give rise to prudential and macroeconomic risks. We detail these risks and discuss the choice of policies to mitigate them. We conclude by evaluating the likely impact of the ongoing global recession and financial crisis on credit growth in Sub-Saharan Africa.

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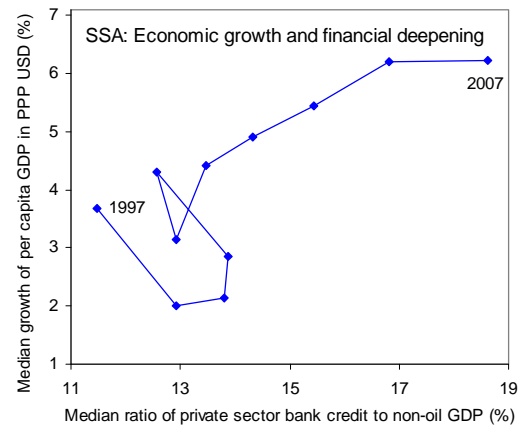
I. INTRODUCTION

1. **In this paper, we analyze the main drivers of credit growth in Sub-Saharan Africa over the past decade and examine the opportunities, challenges, and policy implications associated with it.** We first document the financial deepening that occurred during 1997–2007 and highlight the post-2002 rapid credit growth in a select group of countries (Section II). We next examine the contribution of demand and supply factors and catching-up effects to the observed growth and level of bank credit to the private sector in Sub-Saharan Africa. We use the developed regression models to check whether they can fully explain developments in rapid credit growth countries (Section III). We then argue that rapid credit expansion, whether a manifestation of an unsustainable credit boom or driven by fundamentals, can give rise to prudential and macroeconomic risks. In Section IV, we elaborate on these risks and discuss the choice of policies to mitigate them. We conclude by evaluating the likely impact of the ongoing global recession and financial crisis on credit growth in Sub-Saharan Africa (Section V). Section VI provides a summary of our main findings.

II. CREDIT EXPANSION IN SUB-SAHARAN AFRICA: TRENDS, FACTORS, AND FUNDING

Trends

2. **Financial deepening accompanied the recent pick-up in economic activity in Sub-Saharan Africa.** Sub-Saharan Africa (SSA) enjoyed a period of sustained, robust economic growth since the mid-1990s (IMF, 2008a). The acceleration of growth occurred alongside an even more rapid development of the financial systems in the region. Between 1997 and 2007, the median ratio of private sector credit to non-oil GDP in SSA increased from 11.5 to 18.6 percent, as credit grew faster than non-oil GDP.²



3. **Starting in 2002-03, credit developments across SSA countries started to diverge, as a number of countries experienced rapid growth of bank credit to the private sector.** In 2003-07, a number of SSA countries experienced an average annual growth of real bank private sector credit of over 20 percent, which has led to at least (near) doubling of the ratio of bank private sector credit to non-oil GDP (Box 1). Rapid credit growth (RCG) countries include Angola, Democratic Republic of Congo, Equatorial Guinea, Ghana, Guinea-Bissau,

² The ratio of private sector credit to non-oil GDP is a better measure of financial intermediation in oil-exporting SSA countries, as oil extraction is carried out by foreign companies with access to international credit markets and is hence not financed domestically.

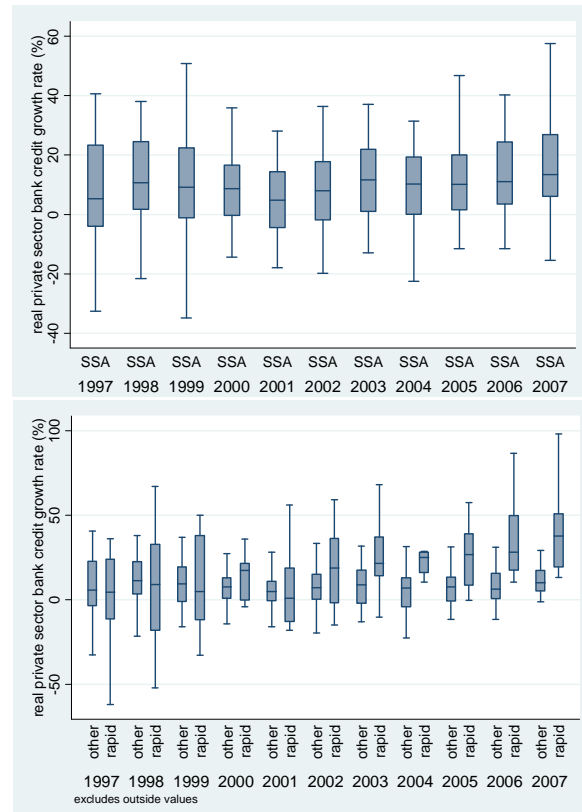
Box 1. Sub-Saharan Africa: Identifying Episodes of Rapid Credit Growth

Identifying countries and periods characterized by rapid credit growth is most often carried out in credit boom studies (Gourinchas, Valdes and Landerretche, 2001; Cottarelli, Dell'Araccia, and Vladkova-Hollar, 2003; IMF, 2004; Hilbers, Ötger, Pazarbasioglu, and Johnsen, 2005; Mendoza and Terrones, 2008). Credit booms are defined as periods of extreme deviations of some measure of credit (i.e., log of real credit or the ratio of credit to GDP) from its trend, with the implicit assumption that such deviations are not supported by fundamentals. An important finding of the credit boom literature is that episodes of excessive credit growth tend to be synchronized across countries (IMF, 2004) and appear to be driven by large rises and ebbs of global financial flows, such as the 1980-s petro-dollar recycling and debt crisis (Mendoza and Terrones, 2008).

In this paper, we seek to identify recent occurrences of rapid credit growth in SSA without making a priori distinction between unsustainable credit booms and fundamentals-driven expansions. To this end, we examine developments in the growth of real bank credit to the private sector and the ratio of bank credit to the private sector to non-oil GDP over the period 1997–2007, without distinguishing between trend and deviations from it. In light of the stylized facts about credit booms, which are a subset of rapid credit growth episodes, we look for a set of countries that have experienced a synchronized break in credit availability in recent years.

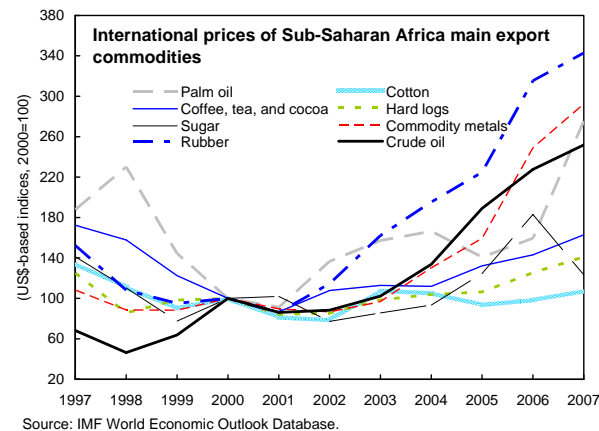
A closer look at the data shows that, across all SSA countries, the median growth rate of real bank credit to the private sector began to accelerate in 2002. The credit expansion was much more pronounced in a select group of countries, which pulled away from the rest by 2003. Whereas the extreme outliers in this group are easy to detect, its exact composition depends on the choice of a cut-off rule. In this study, we identify rapid credit growth countries as having experienced an average annual growth of real bank private sector credit of over 20 percent in 2003–07, which has led to at least near doubling of the ratio of bank private sector credit to non-oil GDP. As seen in the second boxplot, this cut-off rule clearly delineates rapid credit growth countries from the rest from 2003 onwards (i.e., the associated boxes do not overlap).

In terms of a global event that might have sparked the post-2002 credit acceleration in SSA, likely candidates are the rapid increase in international prices of SSA main export commodities, and the more than three-fold increase in private capital flows to Sub-Saharan African countries since 2003 (IMF, 2008b).



Source: IMF International Financial Statistics and WEO databases.

Note: In box plots, the lower and upper hinges of each box show the 25th and 75th percentiles of the samples (all of SSA, rapid credit growth and other SSA countries), the line in the box indicates the respective medians, and the end-points of whiskers mark next adjacent values.



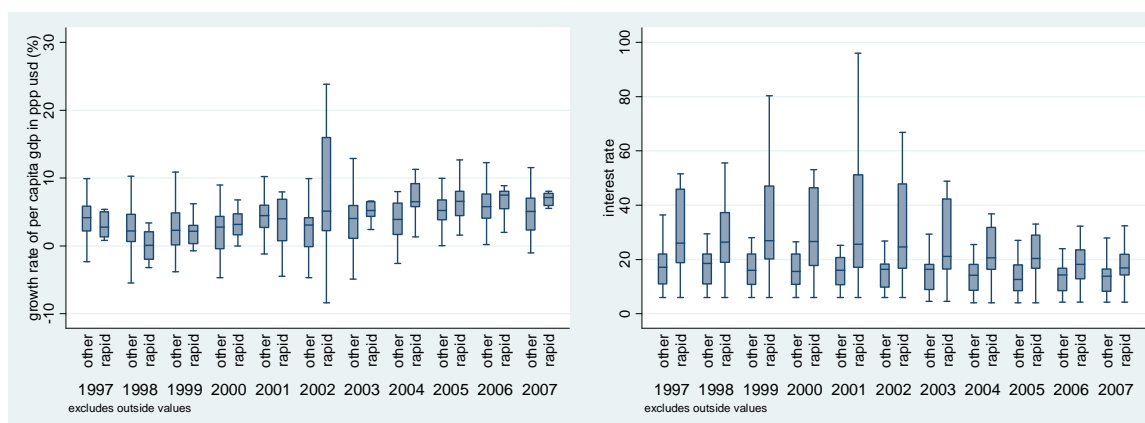
Source: IMF World Economic Outlook Database.

Liberia, Malawi, Nigeria, São Tomé and Príncipe, Sierra Leone, Swaziland, Tanzania, and Zambia. They are a geographically dispersed and diverse set of post-conflict countries, oil producers, heavy recipients of foreign aid, and macroeconomic success stories. But, as we show below, rapid credit growth countries share a number of similarities. In general, these are countries with low initial level of financial development, in which the acceleration of bank credit occurred in the aftermath of macroeconomic stabilization and was accompanied by robust economic growth.

Factors

4. The observed rate of credit expansion is determined by a confluence of demand and supply factors, and the initial state of development of the financial sector (Box 2):

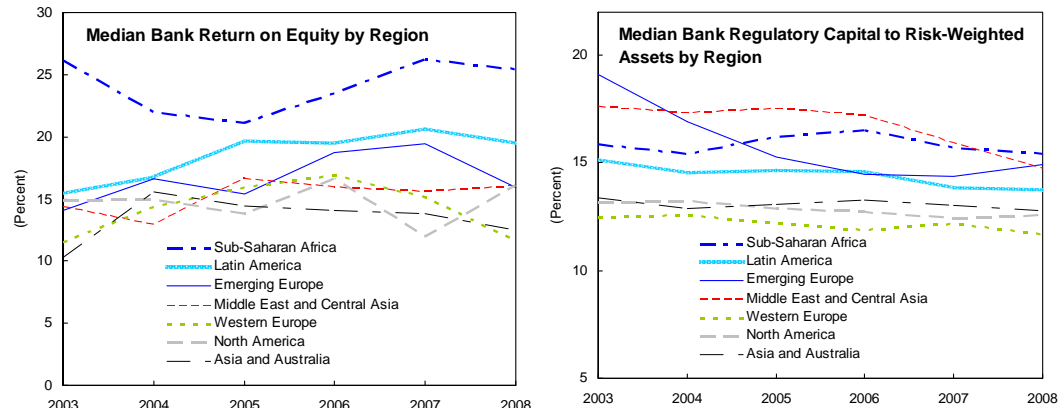
- On the demand side, credit expansion in Sub-Saharan Africa has been driven by robust economic growth and falling nominal interest rates. Rapid credit growth SSA countries grew faster and experienced a bigger drop in interest rates than their peers. The robust and sustained growth of real economic activity has strengthened consumer confidence and business sentiment, boosting consumption and investment and the need for their financing. Falling nominal interest rates have lowered the cost of external financing.



Source: IMF International Financial Statistics and WEO databases.

Note: In box plots, the lower and upper hinges of each box show the 25th and 75th percentiles of the samples of rapid credit growth and other SSA countries, the line in the box indicates the respective medians, and the end-points of whiskers mark next adjacent values.

- On the supply side, credit expansion has been encouraged by banks' high profitability, and facilitated by the high system-wide capital adequacy ratios, which have allowed banks to expand their credit portfolios without breaching prudential norms. Whereas lack of consistency and comprehensiveness of coverage of financial soundness indicators data do not allow comparison between rapid credit growth and other SSA countries, banks in the region are among the most profitable and well capitalized in the world. Consistent data on bank funding costs are also lacking. However, indirect evidence does suggest that liquidity conditions improved in many SSA countries post-2002, which should have lowered the interest rates paid on bank liabilities. In particular, the cost of foreign borrowing was driven down by the fall in



Source: IMF Global Financial Stability Report, April (IMF, 2009d).

the country risk premia and low opportunity cost of funds for foreign parent banks through the third quarter of 2007. The decrease in country risk premia was facilitated by the willingness of investors from mature markets—in their quest for higher returns relative to domestic investments—to accept narrower risk-spreads relative to historic valuations on their overseas investments. At the same time, low nominal interest rates in developed countries, where most foreign parent banks are domiciled, have kept the cost of funding through increases in foreign liabilities low.

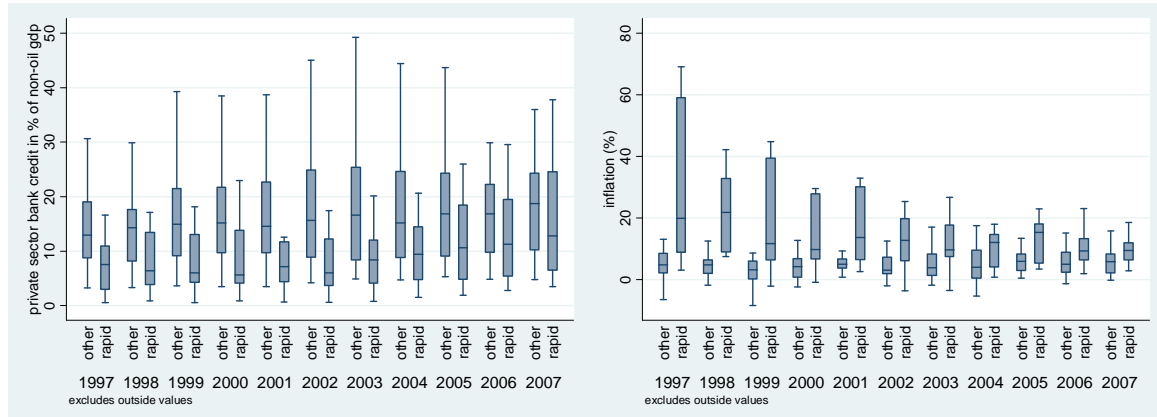
Box 2. Determinants of Credit Availability

Credit supply is driven by the profit-maximizing behavior of banks. Banks expand their credit portfolios as long as lending operations are expected to yield a rate of return on equity that is above the opportunity cost of shareholder funds. The expected rate of return on bank lending depends on the interest rate differential between assets and liabilities, operating costs, and the probability that contracts will be honored. Faced with uncertainty and asymmetric information, creditors ration credit by requiring borrowers to pledge sufficiently large collateral, and imposing limits on the share of external financing in the total cost of projects and on the share of borrower's income that can be used to service the loan. Thus, the supply of credit is positively related to the rate of return on equity, disposable income, and the prices of assets that can be used as collateral. Changes in bank creditors and bank shareholders perception of the riskiness of their investments can also affect the supply of credit, by affecting the cost of borrowed funds and the opportunity cost of own funds, respectively.

Credit demand is driven by households' desire to smooth consumption over the life-cycle, firms need to finance current and future output, and expectations about the rate of return on new investment. Accordingly, credit demand is negatively affected by borrowing costs, and is positively related to current income and wealth, borrowers expectations about future income and asset valuations, and the current and future rates of return on capital. Credit rationing makes the level of initial assets, current income and the rate of interest relatively more important in determining credit availability than expected future income streams and capital gains.

The observed rate of credit expansion also depends on the initial state of development of the financial sector. Empirical studies (Hilbers, Ötoker, Pazarbasioglu, and Johnsen, 2005; Crowley, 2008) invariably find support for the catching-up hypothesis, according to which everything else held constant countries with low initial level of financial development experience higher growth rates of credit than their peers.

- Other factors affecting credit availability are the low initial level of financial sector development conducive of faster rates of credit expansion, and the sizable market shares of foreign banks (IMF, 2009c) with access to modern risk management and operational practices that increase banks' ability to ratchet lending. Rapid credit growth countries are characterized by a much lower initial level of financial

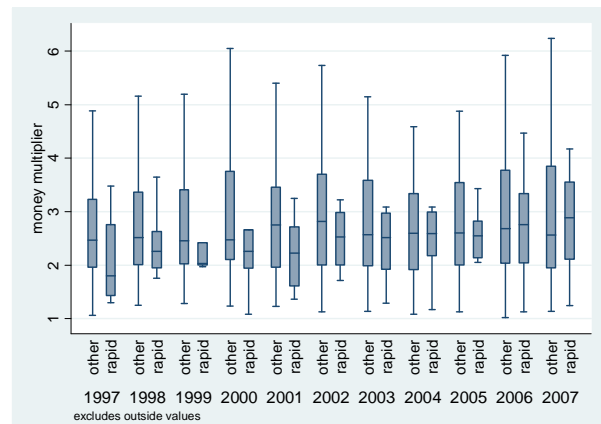


Source: IMF International Financial Statistics and WEO databases.

development, likely linked to the financial repression caused by double-digit inflation and, in some cases, civil strife.

Funding sources

5. **In rapid credit growth SSA countries, the credit expansion was mostly financed by domestic deposits and their faster turnover into new loans.** Whereas at the start of the period, the median money multiplier among rapid credit growth countries was significantly lower than in the rest of SSA, by end-2007 the situation was reversed. The second most important funding source in rapid credit growth countries was bank capital, followed by borrowing from foreign banks (Table 1). Liquidity conditions were further helped by significant external non-debt creating inflows, such as oil revenue and aid.



Source: IMF International Financial Statistics and WEO databases.

Table 1. Contribution of Other Balance Sheet Items to Growth of Bank Credit to the Private Sector in Rapid Credit Growth SSA Countries, 2002–07
(percent)

Rapid Credit Growth SSA Countries	Contribution of other balance sheet items to growth of bank credit to the private sector over 2002-07								
	Total (equal to the growth rate of credit to the private sector in 2002-07)	Assets			Liabilities				
		Foreign assets	Cash and net claims on monetary authority	Claims on government	Foreign liabilities	Total deposits excl. government deposits	Government deposits	Capital accounts	Other Items (net)
Angola	1990.2	-659.8	-1438.5	-833.3	205.9	2969.0	573.5	761.4	412.0
Congo, Dem. Rep. of	1492.3	-1525.2	-470.3	-223.6	341.7	3206.6	244.2	400.8	-482.0
Equatorial Guinea	232.9	-129.9	-487.0	4.6	61.0	560.7	139.1	78.5	5.9
Ghana	466.9	-78.5	-173.4	-101.5	88.3	577.3	39.1	102.9	12.8
Guinea-Bissau	148.6	-111.4	-192.1	...	63.4	223.6	160.8	...	212.0
Liberia	288.1	-297.2	-179.9	16.5	17.9	589.2	1.2	145.7	-5.2
Malawi	361.6	-17.8	4.9	-201.5	64.2	587.1	-1.6	121.7	-195.4
Nigeria	408.3	-57.2	-33.4	-167.9	23.1	412.9	21.7	182.5	26.6
São Tomé and Príncipe	1286.0	-786.2	-524.8	...	956.1	1149.0	27.6	734.1	-269.7
Sierra Leone	415.8	-569.8	-82.3	-202.3	...	1038.7	70.0	268.2	-106.6
Swaziland	237.8	0.4	-19.8	-3.8	-0.5	173.9	11.4	77.3	-1.1
Tanzania	379.2	-61.5	-91.3	-169.0	47.5	512.3	35.3	97.1	8.8
Zambia	454.0	-109.2	-159.7	-151.8	105.2	627.2	72.8	81.1	-11.6

Source: IMF, International Finance Statistics and staff estimates.

Note: ... - Value of balance sheet item was zero in 2002.

Note: $\frac{\Delta CRPS}{CRPS_{t-1}} = \sum_i \frac{\Delta L^i}{L^i_{t-1}} \cdot \frac{L^i_{t-1}}{CRPS_{t-1}} - \sum_j \frac{\Delta A^j}{A^j_{t-1}} \cdot \frac{A^j_{t-1}}{CRPS_{t-1}}$, where $CRPS$ is bank credit to the private sector, A^j are bank assets other than $CRPS$, and

L^i are bank liabilities. Table entries for assets and liabilities are: $100 \cdot \frac{\frac{\Delta A^j}{A^j_{t-1}} \cdot \frac{A^j_{t-1}}{CRPS_{t-1}}}{\frac{\Delta CRPS}{CRPS_{t-1}}}$ and $100 \cdot \frac{\frac{\Delta L^i}{L^i_{t-1}} \cdot \frac{L^i_{t-1}}{CRPS_{t-1}}}{\frac{\Delta CRPS}{CRPS_{t-1}}}$.

III. REGRESSION ANALYSIS OF CREDIT AVAILABILITY AND CREDIT GROWTH

6. **We next examine the contribution of demand and supply factors and catch-up effects to the level and growth of bank credit to the private sector in Sub-Saharan Africa.** We explicitly model both measures of credit market development because, given its low initial level in many SSA countries, it is possible for credit to grow faster than supported by changes in fundamentals, while remaining below or at par with the fundamentals-consistent values in ratio to non-oil GDP. Whereas credit growth that is too rapid and not fully explained by fundamentals can, by itself, contribute to economic vulnerabilities, it is the combination of rapid credit growth and unsustainable debt burden (as measured by the ratio of bank credit to non-oil GDP) that poses the biggest challenges.

7. **The regression analysis leverages on existing empirical studies** (Cottarelli, Dell’Ariccia, and Vladkova-Hollar, 2003; Schadler, Drummond, Nacif, Kuijs, Murgasova, and van Elkan, 2005; Crowley, 2008). Implementations of these models for Sub-Saharan Africa (Singh, Kpodar, and Ghura, 2009; McDonald and Schumacher, 2007; Loukoianova and Shanghavi, 2007) focus on explaining the level of credit to the private sector relative to GDP. We build upon the findings of existing studies by using a larger sample of SSA countries and a wider set of potential explanatory variables, proposing new econometric techniques, and carrying-out a novel analysis of the growth of real bank credit to the private sector in Sub-Saharan Africa.

8. **Regression specifications.** Our dependent variables are the growth rate of real bank credit to the private sector and the ratio of bank credit to the private sector to non-oil GDP. The choice of explanatory variables reflects the theoretical considerations discussed in Section II and the findings of empirical studies. In the exploratory stage of the regression analysis (Appendix II) we consider: (1) macroeconomic demand factors—per capita GDP in thousand PPP USD and the rate of interest;³ (2) measures of different types of external financial flows, used as proxies of liquidity conditions and hence of bank funding costs—current account balance, current account transfers (e.g., inward remittances and foreign aid), various financial account inflows (Appendix Figure 1); (3) indicators of efficiency of financial intermediation—the money multiplier;⁴ (4) catching-up effects—the lagged ratio of bank credit to the private sector to non-oil GDP (in the credit growth regression); and (5) crowding-out effects—the government balance. All variables are entered either as ratios or in natural logs, so that the coefficients can be interpreted as elasticities.

9. **Exploratory regression analysis show that bank credit to the private sector (both as a ratio to non-oil GDP and in terms of real growth rate) is determined by a common set of fundamentals (Appendix II).** These include the per capita GDP in PPP US\$, the rate of interest, the money multiplier, foreign bank claims on domestic banks, the current account balance in percent of non-oil GDP, and the lagged ratio of bank credit to the private sector to non-oil GDP (Models 8 and 20 in Appendix Tables 2 and 3 as replicated in Tables 2 and 3). At the exploratory stage of the analysis we evaluate the different regression models using pooled and within-group (fixed-effects) OLS.⁵ While these estimators have the advantage of computational ease, both are inconsistent in the presence of endogenous explanatory variables and/or a lagged dependent variable. Therefore, in the final stage of analysis we use the System 2SLS estimator—as implemented in Yossifov, Cihák, and Shanghavi (2008)—which is consistent in these circumstances. The more commonly used Arellano-Bond dynamic-panel GMM estimators are not appropriate in the case of our database, because in order to be able to rely on their asymptotic properties, the cross-sectional unit dimension of the data must be very large.

10. **The System 2SLS estimator evaluates by 2SLS the system of simultaneous equations formed by stacking the credit regressions (over time) for all countries in our sample.** The model is estimated with country-specific intercepts and cross-equation

³ Given banks high profitability, credit supply is likely not very elastic with respect to the observed downward changes in interest rates.

⁴ Yossifov (2002) shows that the bank earning-asset multiplier is equal to the money multiplier minus one. On its part, the bank earning-asset multiplier measures the amount of loans created by banks from each additional unit of base money.

⁵ The estimations were performed using STATA (StataCorp, 2008).

restrictions on the other coefficients to make them equal across countries.⁶ Given the structure of the system, the number of suitably lagged explanatory variables that can serve as potential instruments greatly exceeds the degrees of freedom of each equation in the system (see Iossifov, Cihák, and Shanghavi (2008) for details). To overcome this problem, we use as instruments (for all equations in the system) the second lags of the first two principal components of the country-realizations of *per capita GDP in PPP US\$*, the *rate of interest*, and the *ratio of bank credit to the private sector to non-oil GDP*.⁷ This gives us 6 instruments for use on each equation in the system (there are 9 annual observations per country). The instruments are lagged by two periods to ensure their exogeneity with respect to the system's error terms.

11. Tables 2 and 3 present the 2SLS estimates of Models 8 and 20, respectively, and their subsequent refinement. The 2SLS estimates add to the accumulated evidence from pooled and within-group OLS estimates in support of the theoretical predictions of interdependencies between bank credit to the private sector and its main determinants. However, the 2SLS estimates of the coefficients of some explanatory variables are statistically insignificant and we proceed to drop, in steps, those that are statistically insignificant at the 90 percent level of confidence. We arrive at our preferred regression specifications of the determinants of the real growth rate and the ratio to non-oil GDP of bank credit to the private sector (Models 7 and 19) by dropping from the models the current account balance in percent of non-oil GDP. Models 7 and 19 fit the data well, with median R-squared of 0.21 and 0.50, respectively.⁸

12. According to their 2SLS estimates in Model 7, the long-run elasticities of the growth rate of real bank credit to the private sector with respect to the explanatory variables are such that:

- A 1 percentage point increase in the growth rate of per capita GDP in PPP US\$ is associated with a 0.6 percentage point increase in the growth rate of real bank credit to the private sector.
- A 1 percentage point increase in the nominal interest rates is associated with a 0.6 percentage point decline in the growth rate of real bank credit to the private sector.

⁶ This setup also allows 3SLS estimation of the system of simultaneous equations (Iossifov, Cihák, and Shanghavi, 2008). However, the 3SLS estimator is computationally not feasible in the case of our dataset.

⁷ For each of the three variables, we take the variables capturing its realizations in each country in our sample and extract from the resulting dataset the first two principal components. The latter are linear combinations of all variables in the dataset, the values of which capture best the variability of the original data.

⁸ In other words, the models explains more than 21 and 50 percent, respectively, of the variability of the dependent variable in half of the sample countries and less than that in the other half.

- A 1 percentage point increase in the growth rate of the money multiplier is associated with a 0.09 percentage point increase in the growth rate of real bank credit to the private sector.
- A 1 percentage point increase in the growth rate of claims of BIS-reporting foreign banks on domestic banks is associated with a 0.01 percentage point increase in the growth rate of real bank credit to the private sector.
- Finally, for every 1 percentage point difference between the initial ratio of bank credit to the private sector to non-oil GDP in two otherwise identical countries, the real growth of credit in the financially more developed country will be 1.1 percentage point lower than its peer.

13. Similarly, according to their 2SLS estimates in Model 19, the long-run elasticities of the ratio of bank credit to the private sector to non-oil GDP with respect to the explanatory variables are such that:⁹

- A 1 percent increase in per capita GDP in PPP US\$ is associated with a 9 percentage point increase in the ratio of bank credit to the private sector to non-oil GDP.
- A 1 percentage point increase in the nominal interest rates is associated with a 0.08 percentage point decline in the ratio of bank credit to the private sector to non-oil GDP.
- An increase in the money multiplier by 1 is associated with a 2 percentage point increase in the ratio of bank credit to the private sector to non-oil GDP.
- Finally, a 1 percentage point increase in the ratio to non-oil GDP of claims of BIS-reporting foreign banks on domestic banks is associated with a 0.13 percentage point increase in the ratio of bank credit to the private sector to non-oil GDP.
- In addition, the estimate of the coefficient of the lagged dependent variable (0.76) implies a slow speed of adjustment of the actual ratio of bank credit to the private sector to non-oil GDP to its value consistent with fundamentals, with approximately 24 percent of any gap between the two being closed in each subsequent year. It also points to a significant degree of inertia in the measure of financial deepening.

⁹ The long-run elasticities are obtained by dividing the 2SLS coefficient estimates, excluding that of the lagged dependent variable, by one minus the coefficient of the lagged dependent variable.

Table 2. Determinants of Growth of Real Bank Credit to the Private Sector in SSA

Regressors / Dependent variable / Regression model / Estimator	Growth rate of real bank credit to the private sector (%)					
	(8)			(7)		
	OLS	Within (Fixed Effects)	System 2SLS	OLS	Within (Fixed Effects)	System 2SLS
Bank credit to the private sector in percent of non-oil GDP (lagged)	-0.220** (0.057)	-0.966** (0.198)	-1.076** (0.334)	-0.203** (0.058)	-0.982** (0.199)	-1.084** (0.271)
Growth rate of per capita GDP in PPP USD (%)	1.140** (0.152)	0.761** (0.165)	0.610* (0.305)	0.963** (0.142)	0.703** (0.164)	0.598* (0.246)
Interest rate (%)	-0.032 (0.055)	-0.536** (0.083)	-0.586* (0.243)	-0.035 (0.055)	-0.557** (0.082)	-0.591** (0.194)
Growth rate of money multiplier (%)	0.043* (0.021)	0.070** (0.020)	0.092 (0.061)	0.042* (0.021)	0.072** (0.020)	0.092+ (0.050)
Growth rate of claims of BIS-reporting foreign banks on country (%)	0.018** (0.007)	0.014* (0.006)	0.013+ (0.007)	0.017* (0.007)	0.013* (0.006)	0.012* (0.005)
Current account balance in percent of non-oil GDP	0.127** (0.042)	0.095* (0.046)	0.02 (0.125)	...	...	...
Common intercept	10.765** (1.861)	34.788** (3.968)	...	10.480** (1.877)	35.069** (3.983)	...
Country-specific intercepts	No	Yes	Yes	No	Yes	Yes
Observations	430	430	9 per country	430	430	9 per country
Number of countries	...	43	43	...	43	43
Time span	1997-2007					
Adjusted R-squared	0.14	...	...	0.14	...	...
Within adjusted R-squared	...	0.21	...	...	0.20	...
Median R-squared	...	...	0.21	...	...	0.21
F(42, 381) ¹	...	3.27**	...	...	...	...
F(42, 382) ¹	...	...	...	...	3.41**	...
F(1,42) ²	...	2.52	...	...	2.73	...

Notes: Model numbering as in Appendix Table 2. Standard errors in parentheses.

Legend: * - coefficient significant at 10%; * - significant at 5%; ** - significant at 1%.

Sample: Sub-Saharan Africa excluding Guinea-Bissau, Liberia, and Zimbabwe due to data issues.

¹ F-test that all fixed effects are jointly zero.

² Wooldridge test for autocorrelation in panel data (H_0 : no first-order autocorrelation).

Table 3. Determinants of the Size of Bank Credit to the Private Sector Relative to Non-oil GDP in SSA

Regressors / Dependent variable / Regression model / Estimator	Bank credit to the private sector in percent of non-oil GDP					
	(20)			(19)		
	OLS	Within (Fixed Effects)	System 2SLS	OLS	Within (Fixed Effects)	System 2SLS
Bank credit to the private sector in percent of non-oil GDP (lagged)	0.966** (0.015)	0.720** (0.037)	0.749** (0.079)	0.966** (0.015)	0.729** (0.037)	0.756** (0.063)
Per capita GDP in PPP USD (log)	0.194 (0.160)	3.566** (0.888)	2.526* (1.006)	0.191 (0.160)	2.908** (0.813)	2.214** (0.754)
Interest rate (%)	-0.005 (0.008)	-0.021+ (0.012)	-0.019 (0.015)	-0.005 (0.008)	-0.021+ (0.012)	-0.019+ (0.011)
Money multiplier	0.253** (0.082)	0.526** (0.162)	0.492+ (0.284)	0.255** (0.081)	0.518** (0.163)	0.505* (0.231)
Claims of BIS-reporting foreign banks on country in percent of non-oil GDP	0.01 (0.008)	0.027** (0.011)	0.033 (0.024)	0.01 (0.008)	0.030** (0.011)	0.032+ (0.018)
Current account balance in percent of non-oil GDP	0.001 (0.006)	-0.015+ (0.008)	-0.006 (0.017)	...	...	...
Common intercept	0.284 (0.297)	2.286** (0.857)	...	0.27 (0.289)	2.495** (0.852)	...
Country-specific intercepts	No	Yes	Yes	No	Yes	Yes
Observations	430	430	9 per country	430	430	9 per country
Number of countries	...	43	43	...	43	43
Time span	1997-2007					
Adjusted R-squared	0.97	...	...	0.97	...	...
Within adj. R-squared	...	0.64	...	...	0.63	...
Median R-squared	...	...	0.49	...	...	0.50
F(42, 381) ¹	...	2.57**	...	...	...	...
F(42, 382) ¹	...	...	...	...	2.48**	...

Notes: Model numbering as in Appendix Table 3. Standard errors in parentheses.

Legend: * - coefficient significant at 10%; * - significant at 5%; ** - significant at 1%.

Sample: Sub-Saharan Africa excluding Guinea-Bissau, Liberia, and Zimbabwe due to data issues.

¹ F-test that all fixed effects are jointly zero.

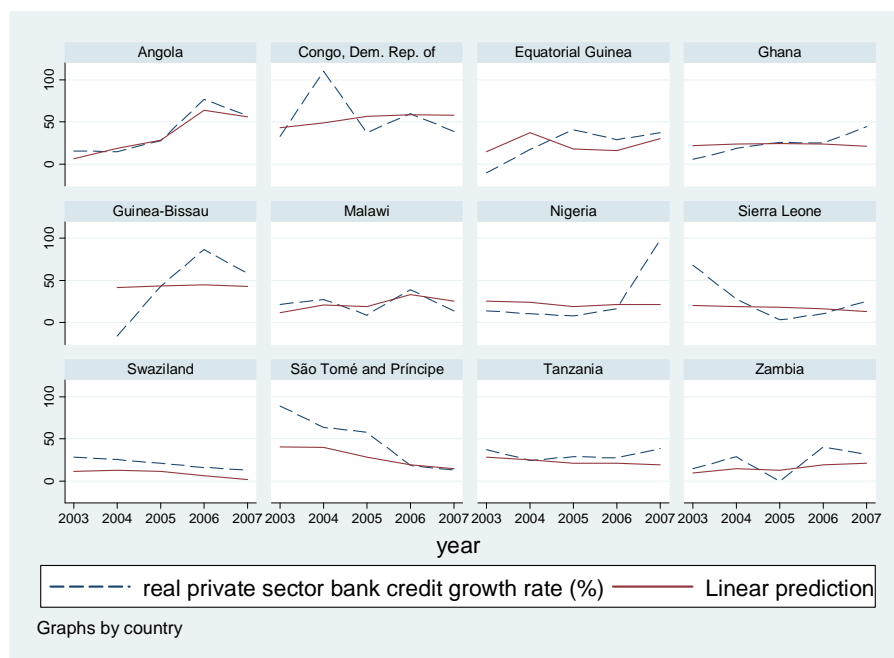
14. Overall, our preferred regression specifications of the determinants of credit market developments in SSA (Models 7 and 19) show that:

- Bank credit to the private sector (both as a ratio to non-oil GDP and in terms of real growth rate) is primarily driven by macroeconomic factors. The magnitudes of the coefficients of nominal interest rates and per capita GDP in PPP US\$ (suitably transformed) are sizable and their signs are consistent with theoretical priors.
- Catching-up effects are strong—everything else held constant, countries with low initial level of financial development experience higher growth rates of credit than their peers. The coefficient of the lagged ratio of bank credit to the private sector to non-oil GDP in the credit growth regression is sizable and its sign is consistent with the catching-up hypothesis.
- Improvements in the efficiency of financial intermediation have contributed to credit market developments in SSA. The coefficients of the money multiplier (suitably transformed) are statistically significant and non-negligible in magnitude.
- Whereas non-debt creating external financial inflows (current and financial account) improve liquidity conditions, they can not, by themselves, explain the observed differences in credit market development across SSA countries. None of the measures of such inflows enter significantly in our preferred regression specifications.
- Foreign bank lending to domestic banks has contributed to the observed credit expansion, but to a smaller extent than other factors. The coefficients of claims of BIS-reporting foreign banks on country (suitably transformed) are statistically significant in both regressions, but relatively small in magnitude.

15. Finally, we check whether the real growth rate and the ratio to non-oil GDP of bank credit to the private sector have deviated from their long-run values consistent with SSA-wide fundamentals in rapid credit growth countries (Figures 1 and 2). We obtain the fundamentals-consistent values of the two credit measures by using the long-run elasticities derived from the 2SLS estimates of Models 7 and 19 (as presented above) and country-specific intercepts that ensure that the predictions and observed values have the same mean over the estimation period 1997-2007. Results show that while the post-2002 rapid growth of credit is, to a large extent, explained by developments in fundamentals, its excessive realizations¹⁰ in some countries have pushed their ratios of bank credit to non-oil GDP above the levels supported by fundamentals.⁹ Further country-level analysis—outside the scope of the present paper—is needed to explore whether country-specific factors can explain the identified deviations from long-run values consistent with SSA-wide fundamentals.

¹⁰ I.e., relative to the equilibrium-response values derived from the average elasticities across SSA countries with respect to the fundamentals included in our regression models.

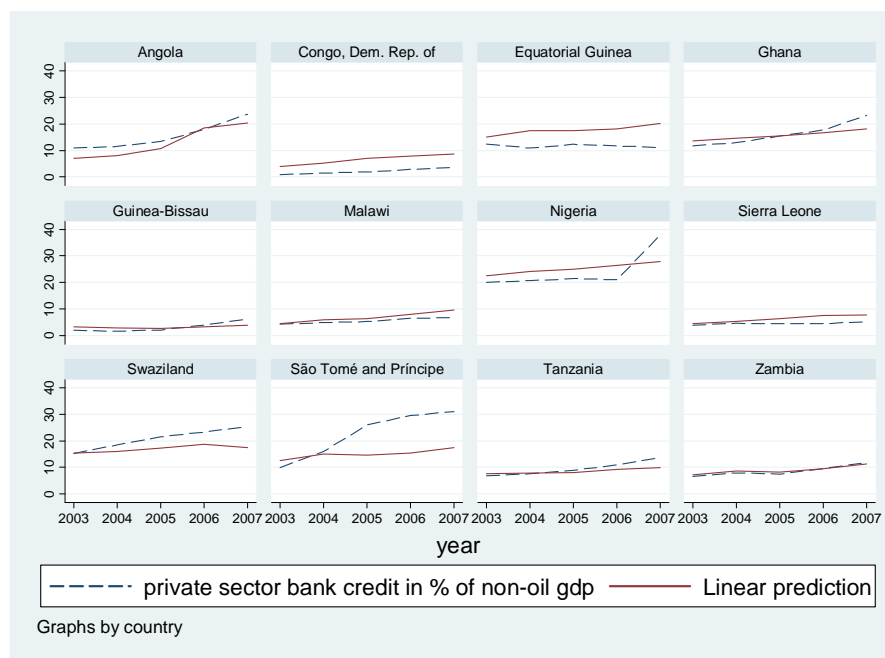
Figure 1. Actual and Equilibrium Growth Rate of Real Bank Credit to the Private Sector in Rapid Credit Growth SSA Countries, 2003–07
(Percent)



Source: Authors estimates using the 2SLS coefficients of Model 7 (Table 2).

Note: Predictions obtained from fitting the regression model over the period 1997–2007.

Figure 2. Actual and Equilibrium Ratio of Bank Credit to the Private Sector to Non-oil GDP in Rapid Credit Growth SSA Countries, 2003–07
(Percent)



Source: Authors estimates using the long-run 2SLS coefficients of Model 19 (Table 3).

Note: Predictions obtained from fitting the regression model over the period 1997–2007.

IV. RAPID CREDIT GROWTH—OPPORTUNITIES, CHALLENGES, AND POLICY IMPLICATIONS

Opportunities

16. **Apart from a credit boom, rapid credit growth is beneficial for the economy and is seen as an important driver of economic growth.**¹¹ Credit availability allows households to smooth consumption over their life-cycle and enables firms to undertake investments that they could not have otherwise made out of their own funds. In the presence of adverse selection and moral hazard, which are particularly acute in SSA countries with weak legal and judicial institutions and corporate governance, banks play an important role of allocating scarce capital and monitoring borrowers to ensure that it funds projects with the highest social payoff (Box 3).

Box 3. Adverse Selection and Moral Hazard in Financial Markets

*Adverse selection.*¹ In financial markets, borrowers of funds typically know more about the quality of their investment opportunities than potential lenders due to the high cost of collecting information on the riskiness of projects by creditors. Potential lenders cannot distinguish high- risk from low-risk projects and they demand a risk premium above the risk-free rate of return on all their investments that corresponds to the average risk of all projects. Intuitively, the excess risk premium imposed on high-quality borrowers offsets the losses incurred in funding high-risk investment projects. As a result, the highest quality borrowers may be priced out of the market.

*Moral hazard.*¹ Once external financing is secured, borrowers have an incentive to break the terms of their contracts with investors and use the funds for riskier projects than agreed upon. When the amount of external financing exceeds the value of firm's own capital, there is a positive discrepancy between the expected private payoff from the project that accrues to the borrower and the expected social payoff that accrues to all parties involved.² As a result, the debtor will always prefer to invest in projects with high expected private payoff, even though their social payoffs might be lower than the social payoff of an alternative low-risk project. Knowing this, the lenders would require an additional risk-premium on the cost of their funds to compensate them for the risks associated with moral hazard. The higher interest rates in the presence of moral hazard prevent firms from pursuing otherwise economically viable investment projects.

¹ In the presence of asymmetric information on the side of borrowers (or shareholders) and creditors (or equity issuers), *adverse selection* could arise *prior* to the act of borrowing (or investing), whereas *moral hazard* could arise *following* the act of borrowing (or investing).

² The expected private payoff is the weighted average (with weights equal to the expected probabilities of the two realizations) of the payoff in case of success and the loss incurred by the borrower, which is bounded by the value of his own capital, in case of failure. The expected social payoff is the weighted average of the payoff in case of success and the loss (up to the full amount invested) in case of failure.

Source: Sundararajan, Das, and Yossifov, 2003.

¹¹ While finance and growth reinforce each other, a growing volume of literature favors the view that a more developed financial sector helps to boost economic growth.

Challenges

17. **Despite the benefits noted above, rapid credit expansion, whether a manifestation of an unsustainable credit boom or driven by fundamentals and catching-up effects, can give rise to prudential, macroeconomic, and balance sheet risks.**¹² In this context, the academic question of whether credit growth in Sub-Saharan Africa is justified by underlying demand and supply factors should be viewed somewhat separately from the assessment of risks and challenges induced by such growth.

18. **Higher credit availability is generally associated with widening current account deficits and potentially higher external debt.** As credit availability increases, consumption and investment demand for imported goods increases. At the same time, the resulting pressures on domestic prices can reduce countries international competitiveness (particularly under fixed exchange rates) with an associated widening of current account deficits. The latter, if not fully financed by inflows of foreign direct and portfolio investment, aid, and remittances translate in higher external debt, increasing countries' vulnerability to exogenous shocks and to a reversal or a discontinuation of financial flows.

19. **Country experiences also show that rapid credit growth usually results in an increased vulnerability of the financial system.** Rapid credit growth can compromise credit quality, as banks management and operation processes are progressively strained by the increased volumes of bank business. In addition, rising asset prices that frequently accompany credit expansions increase collateral valuations, making existing loans appear increasingly better provisioned, and encouraging banks and their clients to take more risk. A reversal of asset prices can lead to an abrupt deterioration of loan quality.

20. **Rising indebtedness of households and enterprises further increase the vulnerability to macroeconomic risks.** Higher debt stock exposes debtors to interest rate risk and, where credit is extended in foreign currency, foreign exchange risk. Debtors vulnerability to higher interest rates and domestic currency depreciation, to the extent that such exposures are unhedged, also subject banks to credit risk. Rising debt service payments resulting from an increase in domestic or foreign interest rates or currency depreciation could have important implications for banks loan portfolios and/or real economic activity, as household and corporate budgets become progressively more stretched to accommodate higher debt service burdens.

21. **The resulting macroeconomic, financial system, and balance sheet vulnerabilities are highly intertwined.** Abrupt changes in interest rates or exchange rates can affect the ability of borrowers to repay their loans, while at the same time concerns about the health of the financial system can influence investors behavior and trigger macroeconomic

¹² Modern theories of currency and banking crises recognize the possibility that a crisis may occur even when not warranted by deterioration in fundamentals (Breuer, 2004).

adjustments. For example, a sudden reversal of capital inflows could bring about a “hard landing” for the economy and force authorities to raise interest rates defensively.¹³ This in turn can lead to a distress in the banking sector via credit risk resulting from higher interest rates (and associated debt service burdens) and slower real growth, in addition to lowering the value of the underlying collateral. In cases where there is significant foreign currency lending, banks could potentially be affected by a direct foreign exchange shock (if their open foreign exchange positions are not hedged) and/or credit risk associated with foreign exchange lending to unhedged borrowers. Similarly, financial sector crises could have significant macroeconomic consequences.

Policy responses

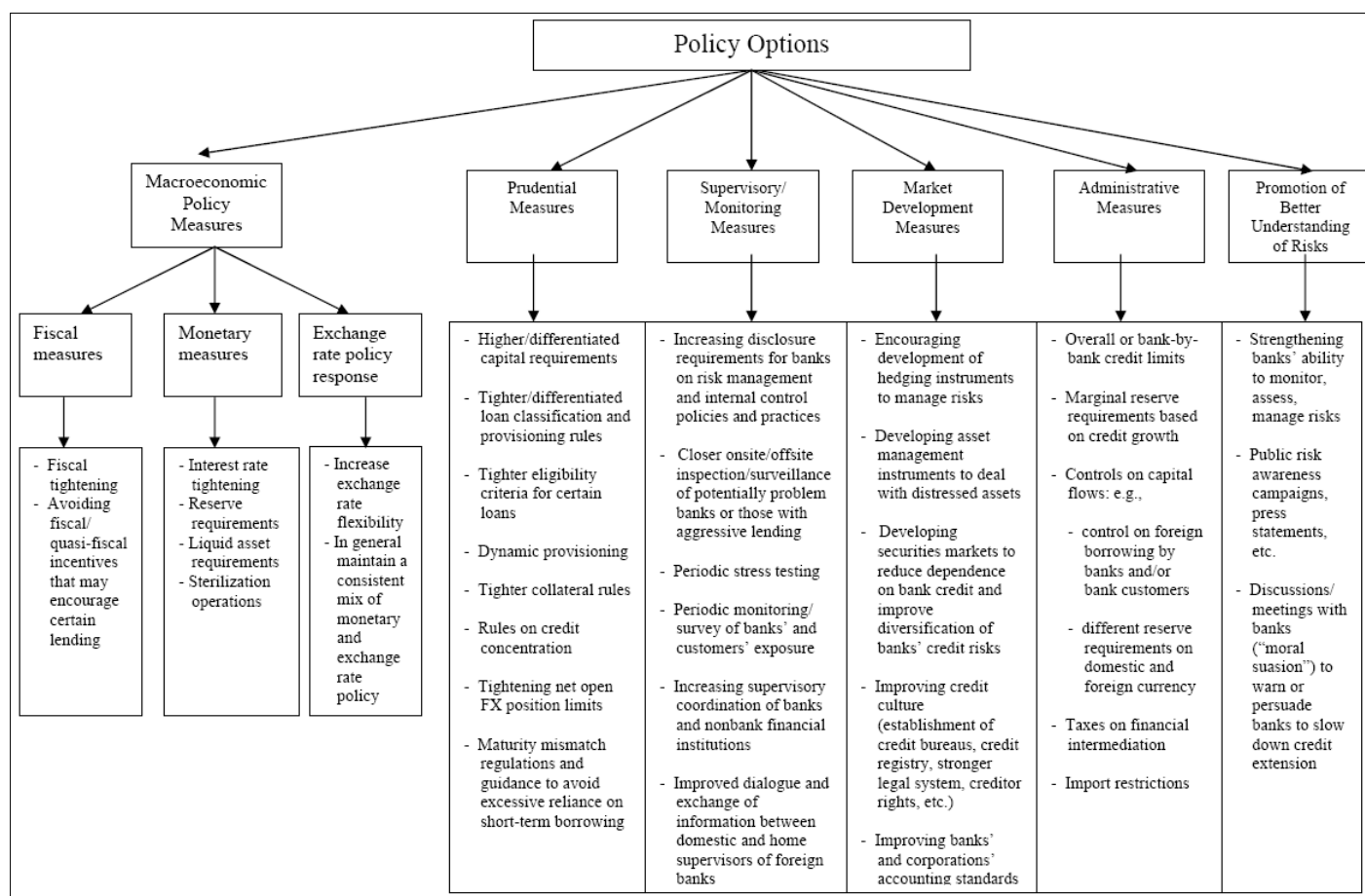
22. **Policy responses should aim at reducing the risks associated with rapid credit growth rather than slowing its pace per se (particularly in countries with low initial level of financial sector development).** They should be conditional on the type of concerns that policymakers have (Figure 3):

- **Macroeconomic policies to slow down credit growth are the first best line of response when macroeconomic stability is at risk.** The effectiveness of monetary policy is limited in countries with fixed exchange rate regimes and in countries with excess bank liquidity. The onus is therefore on maintaining a prudent fiscal stance to counter expansionary pressures resulting from credit expansion. In addition, any fiscal incentives that might have played a role in encouraging credit demand (such as tax deductibility of interest payments, subsidies or government guarantees for housing loans, and interest rate subsidies) should be detected and removed as these market distortions may lead to over-borrowing.
- **Prudential and supervisory measures should be strengthened when financial stability is at risk.** The policy objectives should be to maintain the quality of credit, control risk exposures, and ensure adequate capital to absorb potential losses rather than necessarily limiting the overall level of credit. Prudential measures could include the following: (i) tightening loan eligibility criteria including through formal or informal limits on loan-to-value ratios and debt-to-income ratios; (ii) providing informal or formal guidance for banks on adequate margins that banks should take into consideration in their lending decisions including an assessment of borrowers’ ability to service their loans under scenarios of higher interest rates and/or a weaker domestic currency; (iii) the extension of supervision to non-supervised financial entities (such as leasing companies); (iv) limiting foreign exchange denominated loans to borrowers with foreign exchange income or adequate hedges; (v)

¹³ In the case of fixed exchange rate regimes, interest rates would rise as a result of tighter monetary conditions related to capital outflows.

implementing mark-to-market collateral valuation; (vi) enforcing rules on sectoral credit concentration; and (vii) increasing borrowers' awareness of the various risks associated with borrowing, including requiring banks to disclose to potential borrowers debt repayment under stressful scenarios; and (viii) fine tuning risk weights by credit category (for example, household credit vs. enterprise credit; residential credit according to loan-to-value ratios; and mortgage vs. consumer credit). While prudential measures generally tend to work in the right direction thus potentially slowing down the pace of growth of credit, there are clearly limits to what prudential policies can do in the absence of prudent monetary/fiscal policies.

Figure 3. Menu of Policy Options in Responding to Rapid Credit Growth



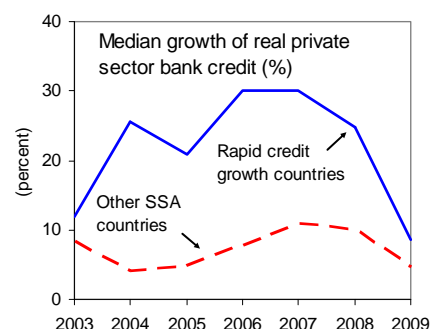
Source: Hilbers, Ötker, Pazarbasioglu, and Johnsen (2005).

- **Administrative measures (such as capital controls on bank borrowing, increases in reserve requirements above what is needed for monetary policy purposes, direct credit controls, financial transaction taxes, etc.) are generally undesirable.** Administrative measures are distortionary, entail costs, and are steps back in the process of financial liberalization that took place worldwide during the past decades. In addition, experience from other countries suggests their effectiveness is mixed at

best. While such measures can curb credit in the short-run, their longer term impact is limited and distortionary, as lending is diverted to other less regulated financial institutions and banks engage in “window-dressing” of their balance sheets. Furthermore, in view of the high profitability of lending in SSA, the amount of reserve requirement increases needed to increase the cost of funds sufficiently to hamper credit growth might be too high (and too distortionary) to implement. Widening the base of the reserve requirements is, however, advisable as it limits the possibilities for circumvention. Finally, administrative measures are also not risk-based—they do not distinguish between more risky lending or between strong and weak banks—effectively punishing strong institutions for risks in weak banks. Accordingly, a careful cost-benefit analysis is needed before such measures are adopted. As a rule, and since these measures are likely to have unintended and undesirable side effects, they should be temporary (Hilbers et al., 2005).

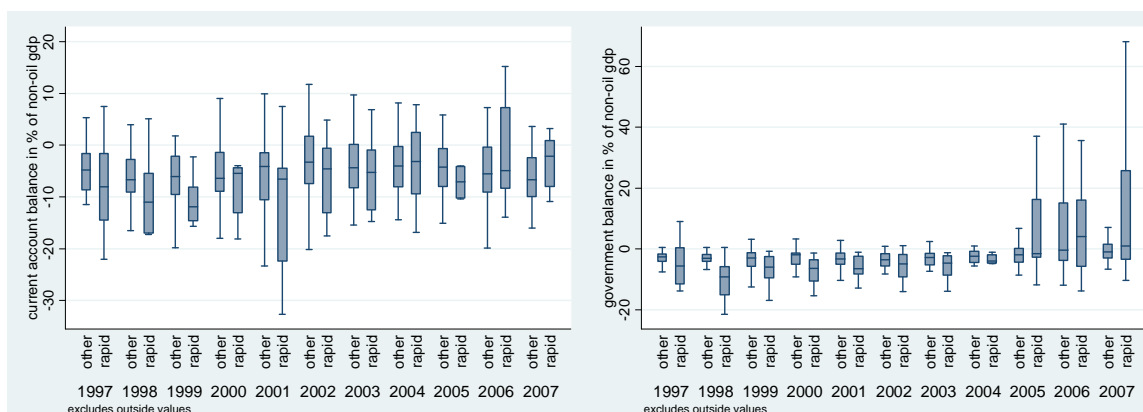
V. IMPACT OF THE GLOBAL RECESSION AND FINANCIAL CRISIS

23. The global recession and financial crisis has significantly slowed credit growth in most SSA countries. SSA countries have been negatively affected by the precipitous drop in global demand for their exports and face the possibility of drying up of external financial flows, such as foreign direct investment, portfolio and other investments, including loans to local subsidiaries by foreign banks, and, possibly, foreign aid. As a result, credit growth, which is procyclical, has slowed down significantly.



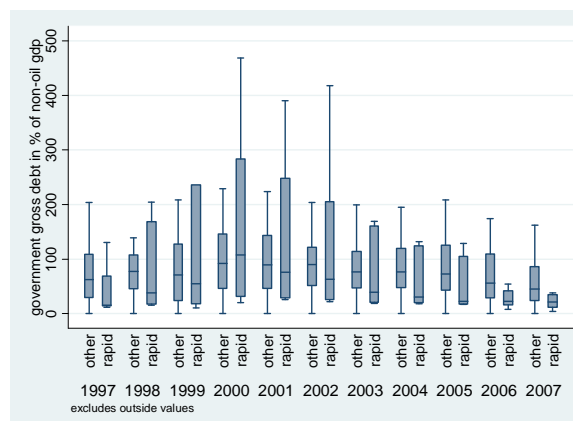
Source: IMF's WEO database.

24. The verdict is still out as to whether the deceleration of credit growth will overshoot its equilibrium response to worsening fundamentals. Rapid credit growth SSA countries are potentially more vulnerable, due to their heightened exposure to the above-noted prudential and macroeconomic risks. On the positive side, most rapid credit growth SSA countries are not afflicted by excessive internal or external imbalances, with their current account and fiscal balances, and external debt (in ratio to non-oil GDP) being similar



Source: IMF International Financial Statistics and WEO databases.

to those in the rest of SSA. They have also, for the most part, avoided riskier funding sources, relying instead on domestic deposits and their faster turnover into new loans. On the negative side, the global crisis with its negative impact of real growth globally may yet trigger financial sector losses linked to deteriorating credit quality, which in turn will impact credit growth and trigger a second round effect on real economic growth. Also, “hard landing” can not be ruled out in countries with pronounced macroeconomic imbalances and weak financial sectors.



Source: IMF International Financial Statistics and WEO databases.

25. **Policy responses would depend on the unfolding impact of the global recession and financial crisis on SSA credit markets.** If the deceleration is orderly and in line with fundamentals, no policy action may be necessary. In countries where there are concerns for a credit crunch and/or financial sector losses, policymakers should prepare contingency plans to shore-up the real and financial sectors. The availability of monetary and fiscal space for proactive economic and supervisory policies would facilitate the response and enhance its effectiveness. On the other hand, in countries with continued strong credit growth policymakers can choose policies from the ones discussed in the preceding section. Finally, all SSA countries should use the spotlight thrust upon their financial sectors by the global financial crisis to prioritize long-pending structural reforms aimed at increasing the efficiency of financial intermediation, with a view of lowering its cost and expanding access to credit.¹⁴

VI. CONCLUSIONS

26. **While all countries in Sub-Saharan Africa have experienced sustained expansion of credit to the private sector in recent years, a subset of countries has been particularly affected.** Credit growth has been largely a product of a host of factors that have affected the region, such as low nominal interest rates, robust real economic activity, increased bank capacity for financial intermediation, favorable liquidity conditions, and generally high bank profitability and capitalization. However, our estimates suggest that, in some cases, the rapid growth of credit has exceeded the rates derived from the average response across SSA countries to developments in fundamentals. Further country-level analysis is needed to

¹⁴ Policy reforms need to address the main impediments to improving access to financial services and increasing financial intermediation including (Gulde, Pattillo, and Christensen, 2006; Singh, Kpodar, and Ghura, 2009): (1) legal and judicial weaknesses in enforceability of claims and property rights; (2) deficiencies in corporate accounting and financial data; (3) weak payment systems; (4) the high percentage of the population engaged in informal activities that cannot meet the documentation requirements of financial institutions.

explore whether country-specific factors can explain the identified deviations from long-run values consistent with fundamentals.

27. **Rapid credit growth generally entails prudential, macroeconomic, and balance sheet risks.** Greater credit availability can fuel internal and external imbalances and lead to higher external debt burden. On the prudential side, rapid credit growth can compromise credit quality, as bank operations become strained by increased business and rising asset prices—that frequently accompany the credit expansion—increase collateral valuations allowing banks and their clients to take more risk. Furthermore, rising indebtedness of households and enterprises expose them to interest rate risk and/or foreign exchange risk. These macroeconomic, financial system, and balance sheet vulnerabilities tend to feed into each other in a downturn.

28. **Policy responses would depend on the unfolding impact of the global recession and financial crisis on SSA credit markets.** If the credit deceleration is orderly and in line with fundamentals, no policy action may be necessary. In countries where there are concerns for a credit crunch and/or financial sector losses, policymakers should prepare contingency plans to shore-up the real and financial sectors. On the other hand, in countries with continued strong credit growth, the choice of policies would depend on the type of concerns arising from rapid credit growth. Tightening of fiscal and/or monetary policies is the preferred response when macroeconomic stability is at risk. Prudential measures should be strengthened when financial stability is at risk, with an objective to maintain the quality of credit, control risk exposures, and ensure adequate capital to absorb potential losses. Administrative measures (such as capital controls on bank borrowing, direct credit controls, etc.) are generally undesirable.

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VARIABLES AND DATA SOURCES

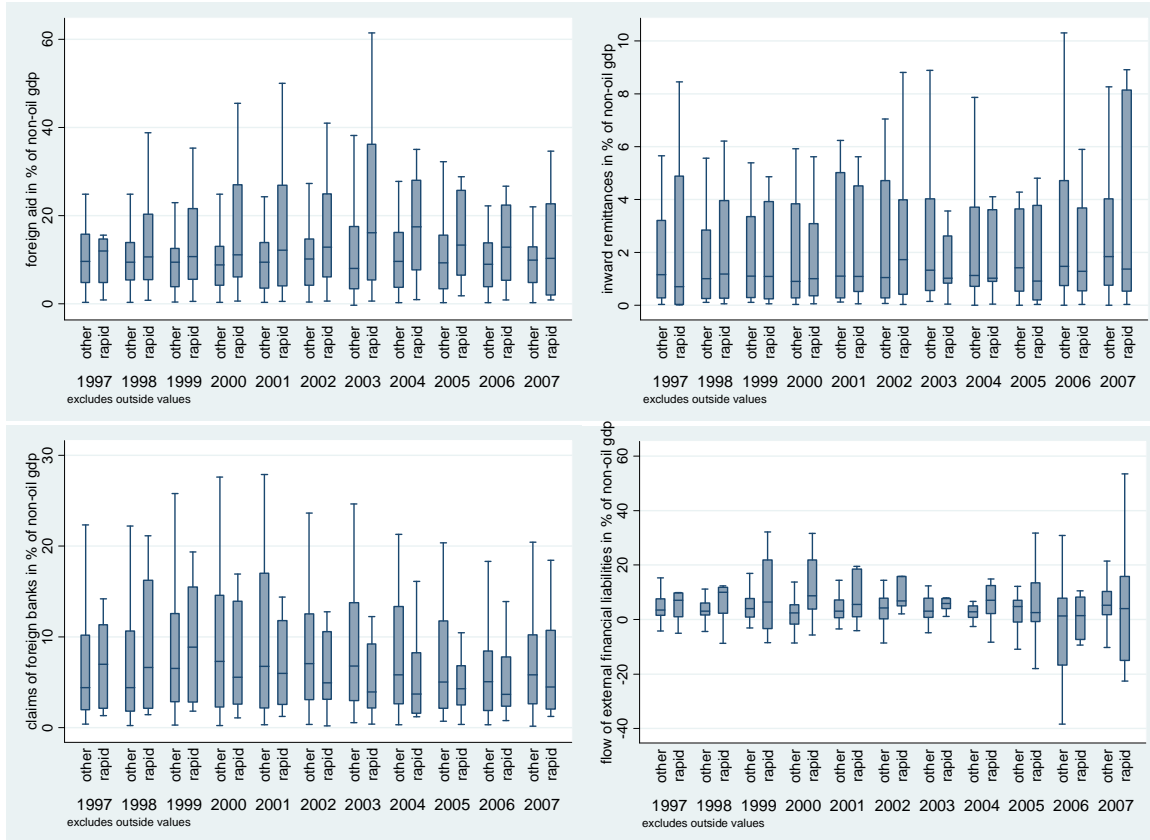
Appendix Table 1. Definitions and Data Sources of Variables

	Variable	Data Series	Unit	Source
<i>g1_rcrdprs</i>	Growth rate of real bank credit to the private sector (percent)	Domestic money bank claims to private sector	Billion dom. currency units (Dom. curr. units)	IMF (2009b)
		Consumer price index	Index (2000 =100)	IMF (2009a)
<i>crdprs_ngdp</i>	Bank credit to the private sector in percent of non-oil GDP	Domestic money bank claims to private sector	Billion dom. currency units	IMF (2009b)
		Non-oil gross domestic product, current prices	Billion dom. currency units	IMF (2009a)
<i>pcngdp_ppp</i>	Per capita GDP in thousand PPP USD	Gross Domestic Product in PPP USD	Billion PPP USD	IMF (2009)
		Total population	Million inhabitants	UNPD (2007)
<i>mmult</i>	Money multiplier (ratio)	Broad money	Billion dom. curr. units	IMF (2009a)
		Reserve money	Billion dom. curr. units	IMF (2009b)
<i>g1_cpi</i>	Inflation rate (percent)	Consumer price index	Index (2000 =100)	IMF (2009a)
<i>int_rat</i>	Interest rate	Lending rate	Percent	IMF (2009b) ²
<i>govbal_ngdp</i>	Government balance in percent of non-oil GDP	General government balance	Billion dom. curr. units	IMF (2009a)
		Non-oil gross domestic product, current prices	Billion dom. currency units	
<i>b_ca_ngdp</i>	Current account balance in percent of non-oil GDP	Current account balance	Billion US dollars	IMF (2009a)
		Non-oil gross domestic product, current prices	Billion dom. currency units	IMF (2009a)
		Average exchange rate	Dom. curr. units/1US\$	IMF (2009a)
<i>frn_bnk_clm_nc</i>	Claims of BIS-reporting foreign banks on country (billion dom. currency units)	Consolidated international claims of reporting banks on individual countries (immediate borrower basis)	USD million	BIS (2009)
		Average exchange rate	Dom. curr. units/1US\$	IMF (2009a)
<i>remit_nc</i>	Inward remittances (billion dom. currency units)	Workers remittances, compensation of employees, and migrant transfers, credit	USD million	WB (2009)
		Average exchange rate	Dom. curr. units/1US\$	IMF (2009a)
<i>aid_nc</i>	Foreign aid (billion dom. currency units)	Official development assistance	USD million	OECD (2009)
		Average exchange rate	Dom. curr. units/1US\$	IMF (2009a)
<i>b_capinfl_lab_nc</i>	Flow of external financial liabilities (billion dom. currency units)	Direct investment in reporting economy	Billion USD	IMF (2009a)
		Portfolio investment, liabilities	Billion USD	IMF (2009a)
		Other investment, liabilities	Billion USD	IMF (2009a)
		Average exchange rate	Dom. curr. units/1 US\$	IMF (2009a)

Note: The table shows the names of the variables as used to refer to their contemporaneous values. Lags of variables are denoted by suffixes “_#”, where “#” stands for the number of years that separate the referred from the contemporaneous values. Annual growth rates of variables in percent are denoted by the prefix “g1_”. Logarithmic transformation is denoted by the prefix “ln_”.

² In case of missing observations, we use data on inflation from the same source.

Appendix Figure 1. Sub-Saharan Africa: External Financial Flows, 1997–2007



Source: See Appendix Table 1.

Note: In box plots, the lower and upper hinges of each box show the 25th and 75th percentiles of the samples of rapid credit growth and other SSA countries, the line in the box indicates the respective medians, and the end-points of whiskers mark next adjacent values.

ADDITIONAL REGRESSION OUTPUT

At the exploratory stage of the analysis we evaluate the different regression models using within-group (fixed-effects) OLS.¹⁵ To establish a benchmark model we sequentially build multivariate regression models for the level relative to non-oil GDP and the growth rate in real terms of bank credit to the private sector by adding fundamentals one at a time and keeping those with statistically significant coefficients (Appendix Tables 2 and 3). In the process, we address the question of whether to enter the interest rate in nominal or real terms. In both the level (relative to non-oil GDP) and real growth credit regressions the coefficients of inflation have negative sign and are lower in magnitude than the coefficients of the nominal interest rate. This provides evidence against entering the interest rate in real terms, because for this transformation to be supported by the data, the coefficients of the nominal interest rate and the rate of inflation would need to be of similar magnitudes and opposite signs.

Models 8 and 20 are our preferred interim regression specifications of the level relative to non-oil GDP and the growth rate in real terms of bank credit to the private sector. All coefficients have signs consistent with theoretical predictions and all are statistically significant at the 90 percent level of confidence. The F-test of the joint significance of all fixed effects (not shown) strongly supports the appropriateness of longitudinal estimation methods by rejecting the hypothesis of a common intercept across countries. The goodness-of-fit measures are high for panel data models.¹⁶

¹⁵ We prefer the within-group estimator over the random effects estimator, because the latter is biased when the country-specific error components in the regressions are correlated with the other explanatory variables.

¹⁶ One can think of the regression of the real growth rate of bank credit to the private sector as a first-difference transformation of a regression model for the log of real bank credit to the private sector. First-difference transformation of variable typically results in a drop in the goodness-of-fit measure.

Appendix Table 2. Sequential Search for Determinants of Growth of Real Bank Credit to the Private Sector in SSA
(Within (Fixed Effects) Estimates)

Regressors / Dependent variable / Regression model	Growth rate of real bank credit to the private sector (%)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Bank credit to the private sector in percent of non-oil GDP (lagged)	-0.789** (0.216)	...	-0.893** (0.210)	-0.926** (0.206)	-0.985** (0.203)	-0.986** (0.200)	-0.982** (0.199)	-0.966** (0.198)	-1.067** (0.215)	-0.983** (0.199)	-1.023** (0.214)	-1.017** (0.201)
Growth rate of per capita GDP in PPP USD (%)		0.694** (0.113)	0.893** (0.169)	0.757** (0.170)	0.703** (0.167)	0.699** (0.164)	0.703** (0.164)	0.761** (0.165)	0.838** (0.217)	0.701** (0.164)	0.725** (0.165)	0.692** (0.164)
Inflation (%)				-0.094** (0.025)	...	...	...	...	...	...	...	...
Interest rate (%)					-0.401** (0.075)	-0.535** (0.082)	-0.557** (0.082)	-0.536** (0.083)	-1.140** (0.233)	-0.551** (0.085)	-0.557** (0.083)	-0.543** (0.083)
Growth rate of money multiplier (%)						0.074** (0.020)	0.072** (0.020)	0.070** (0.020)	0.087 (0.060)	0.073** (0.020)	0.072** (0.020)	0.071** (0.020)
Growth rate of claims of BIS-reporting foreign banks on country (% , in national currency)							0.013* (0.006)	0.014* (0.006)	0.011+ (0.006)	0.013* (0.007)	0.014* (0.007)	0.014* (0.006)
Current account balance in percent of non-oil GDP								0.095* (0.046)	...	...	...	...
Inward remittances growth rate (% , in national currency)									0.004 (0.005)	...	...	...
Growth rate of foreign aid (% , in national currency)										-0.002 (0.008)	...	...
Growth rate of flow of external financial liabilities (% , in national currency)											-0.0003 (0.0003)	...
Government balance in percent of non-oil GDP												0.082 (0.061)
Common intercept	24.858** (3.755)	8.078** (0.978)	22.591** (3.655)	24.919** (3.647)	32.856** (4.016)	35.171** (3.998)	35.069** (3.983)	34.788** (3.968)	44.675** (5.931)	35.029** (3.989)	35.715** (4.150)	35.487** (3.991)
Observations	430	473	430	430	430	430	430	430	346	430	420	430
Number of countries	43	43	43	43	43	43	43	43	38	43	42	43
Time span	1997-2007											
Within adjusted R-squared	0.03	0.08	0.10	0.13	0.16	0.19	0.20	0.21	0.20	0.20	0.20	0.20

Notes: Standard errors in parentheses.

Legend: + - coefficient significant at 10%; * - significant at 5%; ** - significant at 1%.

Sample: Sub-Saharan Africa excluding Guinea-Bissau, Liberia, and Zimbabwe due to data issues.

Appendix Table 3. Sequential Search for Determinants of the Size of Bank Credit to the Private Sector Relative to Non-oil GDP in SSA
(Within (Fixed Effects) Estimates)

Regressors / Dependent variable / Regression model	Bank credit to the private sector in percent of non-oil GDP											
	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
Bank credit to the private sector in percent of non-oil GDP (lagged)	0.818** (0.034)	...	...	...	0.732** (0.037)	0.729** (0.037)	0.729** (0.037)	0.720** (0.037)	0.651** (0.046)	0.728** (0.037)	0.730** (0.040)	0.728** (0.037)
Per capita GDP in PPP USD (log)		8.721** (1.056)	...	...	3.191** (0.798)	3.104** (0.801)	2.908** (0.813)	3.566** (0.888)	4.927** (1.193)	2.854** (0.815)	2.963** (0.814)	2.717** (0.934)
Money multiplier			1.128** (0.245)	...	0.549** (0.162)	0.530** (0.163)	0.518** (0.163)	0.526** (0.162)	0.347** (0.168)	0.524** (0.163)	0.532** (0.158)	0.516** (0.163)
Claims of BIS-reporting foreign banks on country in percent of non-oil GDP				0.106** (0.015)	0.028** (0.011)	0.030** (0.011)	0.030** (0.011)	0.027** (0.011)	0.042** (0.011)	0.030** (0.011)	0.031** (0.011)	0.031** (0.011)
Inflation (%)						-0.01 (0.004)	...	...	...	...	...	...
Interest rate (%)							-0.021+ (0.012)	-0.021+ (0.012)	-0.128** (0.041)	-0.023+ (0.012)	-0.021+ (0.012)	-0.021+ (0.012)
Current account balance in percent of non-oil GDP								-0.015+ (0.008)	...	...	...	...
Inward remittances in percent of non-oil GDP									0.06 (0.091)	...	...	...
Foreign aid in percent of non-oil GDP										-0.02 (0.019)	...	...
Flow of external financial liabilities in percent of non-oil GDP											0.001 (0.008)	...
Government balance in percent of non-oil GDP												0.01 (0.012)
Common intercept	3.726** (0.595)	14.304** (0.417)	13.545** (0.855)	16.246** (0.254)	1.827* (0.761)	2.013** (0.776)	2.495** (0.852)	2.286** (0.857)	5.414** (1.238)	2.739** (0.898)	2.420** (0.839)	2.580** (0.877)
Observations	430	473	473	473	430	430	430	430	353	430	420	430
Number of countries	43	43	43	43	43	43	43	43	38	43	42	43
Time span	1997-2007											
Within adjusted R-squared	0.60	0.14	0.05	0.10	0.63	0.63	0.63	0.64	0.64	0.63	0.64	0.63

Notes: Standard errors in parentheses.

Legend: * - coefficient significant at 10%; * - significant at 5%; ** - significant at 1%.

Sample: Sub-Saharan Africa excluding Guinea-Bissau, Liberia, and Zimbabwe due to data issues.