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Short- Versus Long-Term Credit and Economic Performance: Evidence from the WAEMU

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Abstract

This paper studies the link between financial development and economic growth in the West African Economic and Monetary Union (WAEMU). Using panel data for WAEMU countries over the period 1995-2006, the results suggest that while financial development does support growth in the region, long-term bank financing has a greater impact on economic growth than short-term financing because long-term projects have higher returns adjusted for risks. Given that in the WAEMU short-term credit accounts for about 70 percent of credit to the private sector, WAEMU countries are less able to reap the full benefits of improvements in their financial systems. The results also highlight the importance of macroeconomic stability, a creditor-friendly environment, political stability, and the availability of long-term financial resources in fostering banks' supply of long-term loans.

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I. INTRODUCTION

The finance–growth nexus has been a long-standing economic issue. Since the seminal paper of King and Levine (1993) revived interest in studying how financial development affects economic growth, more than 200 research papers have considered the topic, and about half have been published in academic journals. The mainstream view argues for a positive impact, on the grounds that banks stimulate growth by improving capital allocation, reducing transaction costs, and monitoring projects.[2] Subsequent studies point out that the finance–growth relationship is nonlinear, arguing that it depends on the level of financial development itself, the level of economic development, or inflation. For instance, Gaytan and Ranciere (2004) find that financial development has a larger impact on growth, but above a certain threshold level of per capita income, its impact declines. On the other hand, Wachtel and Rousseau (2000) have shown that high inflation significantly reduces the effect of finance on growth, and high inflation may be more common in lower-income countries with less developed financial markets.

Despite the rich literature, the complexity of the finance–growth nexus is yet to be fully understood. Past studies used monetary aggregates or credit to the private sector to measure financial development. Less attention has been paid to the type of banking system credit (short-, medium-, and long-term) and its suitability to private sector needs. A mismatch between credit supply and demand may have implications for how bank financing translates into economic growth, especially if high-return projects are financially constrained because banks are reluctant to provide medium- and long-term credit (henceforth both are treated as long-term credit). Certainly, the scarcity of long-term credit makes it harder for firms to use external sources to finance investments that are critical to increase their production capacity.[3]

This issue is acute in developing countries, in particular in the West African Economic and Monetary Union (WAEMU), where banks either lack access to long-term resources or choose to avoid long-term commitments because contract enforcement is weak. Another factor makes WAEMU particularly interesting: the eight countries[4] belonging to the zone are a relatively homogenous group because they share the same currency, a common central bank and bank regulator,[5] and a similar legal environment. Yet disparities in member financial development and its trend are still noticeable, as is the distribution of private credit between short- and long-term.

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[2] See Levine, Loayza, and Beck (2000).

[3] Because large firms are able to raise funds from abroad or self-finance their investment, small and medium enterprises (SME), which constitute the backbone of the productive sector, are hit hardest by the lack of long-term credit because they have fewer financial resources and the projects they undertake are innovative, hence riskier. Also, if a firm chooses to start up a long-term investment using credit with shorter maturity, this increases the risk that the project will be delayed or halted if the credit line is not renewed.

[4] Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, and Togo.

[5] The *Banque Centrale des Etats de l'Afrique de l'Ouest* (BCEAO) and the Regional Banking Commission.

Financial development in the WAEMU is low, though comparable with other sub-Saharan African (SSA) countries.[6] In the WAEMU short-term credit accounts for the bulk of bank financing to the private sector, averaging 70 percent of private credit, and ranging from 60 percent in Togo and Senegal to nearly 90 percent in Guinea-Bissau. Against this background, this paper aims to assess whether more financially developed WAEMU countries tend to growth faster than the others. Moreover, it goes beyond past studies by analyzing whether banking systems that provide more short-term credit than long-term undermine the contribution of financial development to economic growth, and why they are doing so.

In what follows, Section II presents arguments for the importance of long-term bank financing for economic growth and discusses factors that undermine incentives for banks to provide long-term credit. Section III describes the banking system in the WAEMU, emphasizing the distribution of short- and long-term credit to the private sector, the sectoral allocation of credit, and its trend in the past decades. Section IV presents the model and the results. Finally, Section V concludes and offers policy recommendations.

II. THEORETICAL BACKGROUND

In briefly reviewing the theoretical grounds supporting a favorable effect of financial development on economic growth, we highlight the point that what matters is not just the volume of credit directed to the private sector but also the type, which may not suit firms' needs because of market imperfections. We then review developments in the financial sector in WAEMU countries and discuss related empirical studies.

Financial development and economic growth

Levine (1997) outlines the main functions through which financial development spurs growth. The financial sector plays an important role in mobilizing financial resources and channelling the funds to the best uses. By funding projects with the highest returns, banks foster technological innovation, encourage capital accumulation, and therefore promote economic growth. By offering households safe and liquid deposit opportunities and choosing an appropriate mix of liquid and illiquid investments, banks provide complete insurance to savers against liquidity risk while facilitating long-run investments in high-return projects. Financial intermediaries lower transaction and information costs because they stand in for savers, who lack information and the capacity to assess the quality of projects, with a view to ensuring that capital is put to the best use.

Further, financial intermediaries ease the problem of asymmetric information between savers and borrowers. Once the project is financed, banks can monitor corporate managers to ensure that a firm is run in the best interests of shareholders and creditors. By carefully designing financial contracts and collateral mechanisms, they help to lower monitoring and enforcement costs.

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[6] Average private credit to GDP stood at 12 percent for WAEMU countries over 1995–2006, compared with 15.6 percent for other SSA countries (excluding central African CFA countries).

Despite the burgeoning literature, the debate on the role of financial development in promoting economic growth is still far from settled. One aspect that has attracted little attention is the type of credit offered by financial intermediaries.

Short versus long-term credit

Generally, short-term credit is defined as a bank loan with a maturity of less than a year, while long-term credit is a loan repayable beyond a year without a provision for rollover. The literature on the relationship between finance and growth implicitly refers to long-term credit in discussing the role of banks in allocating capital to projects with the highest returns. However, in investigating the impact of financial development on growth, studies use an aggregate credit indicator without differentiating between short- and long-term credit.

Short- and long-term credit may have different impacts on output production because they do not serve the same purpose. Short-term credit includes commercial paper, lines of credit, and overdrafts, which finance working capital for a limited period of time, usually less than a year. This may finance some short-term investments that take relatively little time to build and generate output relatively fast. In contrast, long-term credit is suitable for high-return projects that require a continuing commitment of capital for years. Those investments take more time to complete but contribute more to productivity growth than short-term investments. For instance, short-term investments may be used to maintain equipment, while long-term investments may be used to build a new plant, invest in research and development, or adopt a new technology. Because long-term credit can finance higher-return projects, its impact on economic growth is likely to be larger than that of short-term credit. Put differently, limited availability of long-term financing will prevent firms from carrying out high-return projects, or delay such projects because they have to be financed internally.

It is shown that long-term borrowing constraints reduce long-term growth due to higher growth volatility. Under perfect market conditions, a firm's investment decisions are independent of its financial condition, but with imperfect capital markets, credit constraints make the firm's investment and borrowing capacity highly sensitive to cash flow. When credit constraints are more severe for long-term than for short-term financing—usually because of liquidity and return risk—any exogenous shock to cash flows exacerbates output fluctuations because they translate into a less stable investment rate, more growth volatility, and hence lower long-term growth. Fazzari, Hubbard, and Petersen (1988) find that firms with higher asymmetric information problems that prevent them from satisfying the conditions for long-term borrowing are more sensitive to cash flows.

In addition, Audretsch and Elston (2002) argue that a negative shock to cash flows lower investment, but also reduces the firm's borrowing capacity so that it cannot resort to external finance to compensate temporarily for the shortfall in internal finance. The authors highlight that the impact of financing constraints on investment behavior tends to increase systematically as firm size decreases, which implies that Small and Medium Enterprises (SMEs) are hardest hit.

In sum, there is a theoretical basis for the hypothesis that financial systems that offer more long-term credit are likely to foster faster growth than economies where long-term financing is constrained. This is not to imply that short-term credit is not important for economic growth. Some sectors, such as the agricultural and trade sectors in developing countries, rely on short-term capital because they have a short production cycle and their technology requires little capital. Because rollover of short-term loans enhances the firm-bank relationship, it may also improve firm access to long-term financing. Also, to cope with a scarcity of long-term financing, firms may use short-term loans to finance investments with longer maturities, though the uncertainty about full financing increases risk. Finally, long- and short-term credits are related since new investments financed by long-term loans would need working capital to operate.

What may constrain supply of long-term loans?

Liquidity risk tied to long-term projects, difficulties in enforcing contracts, information asymmetry, and macroeconomic instability are the major factors that make banks reluctant to provide firms with long-term credit. Excess liquidity and lack of bank expertise are also thought to be limiting factors. Below we discuss how each of these factors operates in the WAEMU.

Because long-term projects take time to mature, they entail higher liquidity risk. In developing economies banks often lack long-term resources, and because they must maintain a minimum liquidity ratio they have less capacity to extend long-term financing. In the WAEMU, the regulation on liquidity ratio requires that at least 75 percent of a bank's short-term liabilities be covered by short-term assets, and the regulation on the transformation ratio similarly requires that 75 percent of medium- and long-term bank assets be financed by resources of comparable maturity. In 2007, 69 percent of banks were in compliance with the liquidity ratio, but only 56 percent were in compliance with the transformation ratio—the lowest compliance rate for any prudential ratio set by the regional Banking Commission—mainly because banks lack long-term resources.

Another problem for long-term credit is access to international capital markets. To complement domestic long-term resources, in theory banks can raise funds by tapping the international financial markets directly or through foreign parent banks. However, foreign participation in WAEMU banking systems has declined because governments played an important role in the recapitalizations during the bank crisis in the late 1980s. Although emerging regional banking groups, stimulated by the *Agrément Unique* in 1999,[7] could improve financial integration by moving resources from countries with surpluses to deficit countries, they too lack access to international markets for mobilizing long-term capital. In addition the long-term government bond market is tiny and has started to take off only recently, providing limited information for banks on the yield curve and how to price adequately private long-term lending.

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[7] With the *Agrément Unique*, a single banking license is sufficient to set up banking operations anywhere in the WAEMU.

Even if banks are able to finance long-term projects, they may be reluctant to do so where contracts are poorly enforced and investors have few rights. Legal uncertainty in the business environment raises the perception of the risk associated with investment. A weak legal environment undermines creditor rights and prevents them from gaining possession of collateral or liquidating a firm to meet obligations (La Porta, Lopez-de-Silanes, Shleifer and Vishny, 1998).

To encourage bank lending, the rule of law should be clear and its enforcement effective. This is even more important for long-term credits that carry higher risk for creditors and increase uncertainty about the capacity of the borrower to repay. Caprio and Demirgüç-Kunt (1998) note that bankers retain control over their clients by sequencing a series of short-term loans, because the option to discontinue rolling over these loans is easier to exercise and is a more credible near-term threat. In the WAEMU, the implementation of the regional OHADA[8] legislation is weak, partly because of low funding for the judicial systems and capacity constraints. Senegal, however, has recently carried out significant reforms to improve the legal and judicial framework, especially by increasing the number of magistrates and court clerks.

Long-term debt creates an agency problem, which can be reduced when lenders know more about borrowers. In WAEMU countries the central bank maintains a public credit registry that has information on delinquent loans, but limited coverage and lack of good collateral exacerbate information asymmetry. The World Bank estimates that about 3.5 percent of the adult population in the WAEMU is covered by a credit registry compared with 7 percent in the rest of SSA. Singh, Kpodar, and Ghura (2009) find that the lack of progress in making credit information available and protecting investors may explain why financial systems in the CFA franc zone are shallower than in the rest of SSA. Moreover, Powell and others (2004) underscore that recording both positive and negative information[9] makes it easier to predict default probabilities for borrowers, allowing banks both to reduce portfolio risk and extend more credit than when they have access only to negative information.

Macroeconomic instability discourages long-term financing because high inflation depresses long-term financial contracting, and financial intermediaries will tend to keep their portfolios very liquid. Thus, as inflation rises intermediaries will be less eager to provide long-term financing for capital formation and growth (Wachtel and Rousseau, 2000). Inflation in WAEMU countries has been low and stable compared with other SSA countries thanks to the peg to the euro,[10] so that the environment is less risky for banks. Political, like macroeconomic, instability also increases uncertainty about returns on projects, so where it occurs banks will be reluctant to enter into long-term commitments.

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[8] *Organisation pour l'Harmonisation en Afrique du Droit des Affaires.*

[9] "Negative information" refers to data on late payments and defaults; "positive information" refers to information on borrowers who have paid their obligations on time.

[10] Periods of high inflation occurred during the devaluation of the CFA franc in 1994 and more recently following international food and fuel price hikes.

Excess liquidity also undermines bank willingness to provide long-term credit because banks have no incentive to secure long-term resources, and the regulation limits the use of short-term liabilities to finance long-term assets. Indeed, excess liquidity—mostly at short-term maturity—is costly for banks, especially when reserves are not remunerated,[11] because the banks are paying interest to depositors on funds that do not generate revenues for them; thus the negative interest spread depresses mobilization of additional resources to finance long-term credit. Historically, there has been a high level of excess liquidity in the WAEMU banking system, primarily due to the lack of attractive investment opportunities, combined with conservative policies in the banks vis-à-vis credit risk. The IMF (2005) points out that mopping up excess liquidity would not only strengthen the effectiveness of the regional monetary policy, but also support the mobilization of long-term resources and the development of the financial market.

Finally, human capital may be an impediment in designing and assessing the financial viability of investment projects. On the supply side, the underdevelopment of professional credit risk management can limit bank financing because banks lack the tools and knowledge to assess projects properly. Instead, they often rely on collateralization, which can limit or drive up the cost of access to bank credit. On the demand side, low-skilled entrepreneurs may not be able to design bankable projects and provide reliable and comprehensive financial information about projects.

III. STYLIZED FACTS

Financial development is shallow in the WAEMU region, and the financial system is dominated by banks. WAEMU banking systems, as in most developing economies, are highly concentrated (see Figure A1 in the appendix) and suffer from excess liquidity, although that has eased in recent years with rapid expansion of the markets for treasury bills and government bonds. Despite a high nonperforming loan (NPL) ratio[12] and high overhead costs, banks are relatively profitable because they have comfortable net interest margins.[13]

The most financially developed country in the region is Senegal, where private credit accounted for 21 percent of GDP in 2006 (Figure A2 in the appendix). Guinea-Bissau is least financially developed, with a ratio of private credit to GDP of 3.5 percent—one quarter of the regional average. In Côte d'Ivoire, financial development has plunged from a high of 37 percent of GDP in 1990—at the time the highest in the WAEMU—to a mere 13 percent in 2006, barely above Niger and Guinea-Bissau.

The banking crisis several WAEMU countries experienced in the late 1980s eroded financial development. Most of the countries experienced a steady decline in private credit during that

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[11] Statutory reserves are not remunerated in the WAEMU.

[12] The quality of bank portfolios, however, varies by country: net NPLs are well above the regional average in Togo and Mali.

[13] Net interest margin is defined as the average return on loans less the average cost of resources.

period, with a noticeable drop in 1994 when the CFA franc was devalued. The sudden drop reflects both a contraction in credit to the private sector and an increase in nominal GDP due to the initial devaluation-induced price surge. Private credit recovered to the early 1990s level in countries where banks were successfully restructured. In the others, fiscal expansion, political instability, and the fact that troubled banks continued to operate slowed the growth of the financial sector.

Turning to the distribution of short- and long-term loans, Figure A3 (in the appendix) shows that credit is mostly short-term; in most WAEMU countries the share of long-term credit in total credit is not just low but is declining. The most striking case is Guinea-Bissau—a post-conflict country with very shaky banks—where short-term credit accounts for over 90 percent of the total. In all countries long-term credit dropped after the 1994 devaluation, reflecting uncertainties about how economies would react to that shock. Country-specific shocks also are a factor: banking distress in Togo contributed to the recent fall in the share of long-term credit there, as did political instability in Côte d'Ivoire and Guinea-Bissau. Inadequate loan recovery procedures and problems with the judicial system were also causal, but it is difficult to assess to what extent they account for cross-country variations.

It is also useful to look at the allocation of credit by sector (Figure A4 in the appendix). Although agriculture has the highest share in GDP, it has the lowest share of credit to private sector because farmers have difficulties accessing bank credit. The trade sector benefits the most, with a share of about 40 percent of the total, though its contribution to GDP is less than 20 percent.

Sectoral shares in short-term credit are more or less stable, reflecting credit rollover over a long period. The share of agriculture nonetheless shows some volatility because it is highly sensitive to the production of cash crops.

The devaluation changed the pattern of sectoral distribution of long-term credit. Export-oriented sectors like agriculture and services (mainly tourism) experienced an increase,[14] but the trade sector, which relies on imported goods, posted a decline. It appears that industry did not benefit from the devaluation:[15] its share in GDP remained flat, and its long-term credit share fell as the shares of agriculture and services rose. The pickup in long-term credit to the energy sector in 1998 was triggered by the energy crisis in WAEMU countries after a severe drought, which prompted electricity companies to invest in diesel-run power plants.

Surprisingly, long-term credit to agriculture is also sensitive to fluctuations in crop production. The reason is that the sector is dominated by large public enterprises, which

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[14] The recent boom in telecommunications has also helped increase long-term credit to the service sector. Long-term credit includes mortgages to households, but the share is low except in Côte d'Ivoire and Senegal.

[15] It may be possible that limited domestic market and low regional integration hampered the competitiveness of the industry sector. Although the devaluation would raise the price of imported goods, local industries may not be competitive enough to increase their market share due to high production cost.

because of a structural deficit in the sector use long-term credit to finance operations (purchase of inputs and production) or to clear arrears to producers.[16]

The finance and growth nexus in the WAEMU

Few studies deal with the impact of financial development on economic growth in the WAEMU, and the results are inconclusive. Odedokun (1996) puts forward a theoretical framework that captures the external effects of the financial sector on the real sector and the effects of the financial sector on factor productivity. The model, tested for 71 developing countries using ordinary least squares (OLS) with time series data for the 1960s and 1980s, suggests that financial development promoted economic growth in about 85 percent of the countries, with an impact at least as large as that of other factors that have been emphasized as important growth-promoters (e.g., export growth and capital formation). For five WAEMU countries in the sample, the coefficient for financial development is positive but it is only significant for Burkina Faso and Niger. In contrast, Bhatia and Khatkhate (1975) and Spears (1992) find a positive bivariate relationship between financial development and growth in Côte d'Ivoire in the 1960s to 1980s. Joseph, Raffinot, and Venet (1998) do not find evidence for a positive finance-growth relationship in a panel of WAEMU countries for 1970–1995. However, country-specific analysis reveals that finance causes growth— consistent with the supply-leading effect—in Benin, Côte d'Ivoire and Mali, while the demand-leading effect holds in Burkina Faso, Senegal, and Togo. No causality between finance and growth was found for Niger.
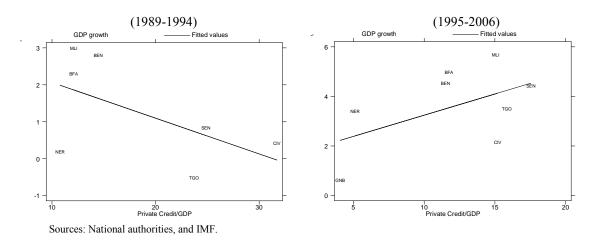
These studies are limited by omitted variable bias, endogeneity issues, country heterogeneity,[17] and—most important—the period studied. The studies cited focus on the pre-reform period. In the second half of the 1990s, WAEMU countries implemented bold structural reforms, including an exchange rate adjustment, intended to enable sustainable growth and restore macroeconomic stability. Banking supervision has been improved significantly. A single Banking Commission was created in 1990, and interest rates were liberalized in 1993. At the same time, government ownership of banks declined, although it is still high.

Financial development seems to be negatively correlated with economic growth in the WAEMU for 1989–1994 (Figure 1), though the coefficient is not significantly different from zero. In contrast, after 1995 the relationship turns positive and marginally significant, suggesting that the reforms may have yielded positive results.

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[16] The large increase in long-term credit to agriculture in 2002 mostly reflects the financing of the cotton crop in Mali. With good rainfall cotton production more than doubled in 2002 stimulated by an increase in the producer price of 14 percent. Long-term credit to agriculture increased by nearly 500 percent in 2002, whereas short-term credit rose by 72 percent. Banks were aided by a surge in deposits as Malians living in Côte d'Ivoire repatriated savings, and activities were transferred from banks in Côte d'Ivoire to Malian banks during the Ivorian crisis.
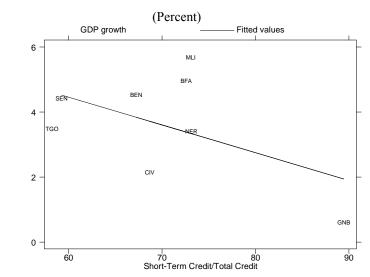
[17] Joseph, Rafinot, and Venet (1998) state that the contrasting results of the panel approach and the country-specific analysis could be attributable to wide variations (high volatility) in the level of financial development.

Figure 1. WAEMU: Financial Development and Economic Growth, 1989–2006

(Percent)

Sources: National authorities, and IMF.

Because we want to assess whether countries with a higher share of long-term credit in total credit perform better than their peers, we also illustrate the relationship between the share of short-term credit in total credit and real GDP growth for WAEMU countries for 1995-2006. The relationship is clearly negative (Figure 2). In the following sections this finding will be assessed more rigorously by controlling for other growth determinants.

Figure 2. WAEMU: Share of Short-Term Credit in Total Credit and Economic Growth, 1995–2006

(Percent)

Sources: National authorities, IMF, and BCEAO.

IV. EMPIRICAL ESTIMATIONS

A. Models and Data

Like previous studies on the finance and growth nexus, we adopt the most used indicator of financial development: credit to the private sector in percent of GDP ($F_{i,t}$). Since the aim is to assess whether short-term credit and long-term credit have different impacts on economic growth, this indicator is separated into two components: (1) the ratio of short-term credit to GDP ($F_{i,t}^{short}$), and (2) the ratio of long-term credit to GDP ($F_{i,t}^{long}$). The econometric analysis uses panel data for WAEMU countries with annual observations for 1995–2006. As emphasized in the previous section, the relationship between financial development and growth has changed since the mid-1990s; we therefore chose to focus on the post-reform period given the statistical challenges to account for structural breaks in small samples. Nevertheless, we assess the sensitivity of the results to the time period considered.

We use a standard growth model where economic growth measured by real GDP growth depends on financial development ($F_{i,t}$); the initial level of GDP per capita (y^0); capturing convergence effects; and a set of control variables ($X_{i,t}$), including secondary school enrolment as an indicator of human capital accumulation, inflation to measure economic stability, government expenditure as a percent of GDP, and trade openness. The model specification is as follows:

$$g_{i,t} = \alpha_0 + \alpha_1 * l\og\left(y_{i,t}^0\right) + \alpha_2 * F_{i,t} + A * X_{i,t} + u_i + \varepsilon_{i,t} \tag{1}$$

where: $$F_{i,t} = F_{i,t}^{short} + F_{i,t}^{long} \tag{2}$$

u_i is an unobserved country-specific effect, and

$\varepsilon_{i,t}$ is the error term.

Combining Eq.1 and Eq.2 yields the unconstrained model as follows:

$$g_{i,t} = \alpha_0 + \alpha_1 * l\og\left(y_{i,t}^0\right) + \alpha_2^s * F_{i,t}^{short} + \alpha_2^l * F_{i,t}^{long} + A * X_{i,t} + u_i + \varepsilon_{i,t} \tag{3}$$

The unconstrained model allows the coefficients for the short- and long-term credit ratio to GDP to be different. In the constrained model (Eq.1), the coefficient for financial development is the weighted average of the coefficients for the short- and long-term credit ratio to GDP, with the weight being the shares of short-term and long-term credit in total credit.

The second model we developed looked at the determinants of the share of long-term credit in total credit ($S_{i,t}$) in order to identify factors that enhance the ability of banks to supply long-term credit. We adopt a parsimonious approach by testing a wide range of factors we

discussed in the previous sections. The baseline model includes as explanatory variables GDP per capita ($y_{i,t}$) to capture the level of development, and the share of time and saving deposits in total deposits ($Dep_{i,t}$) to measure the availability of long-term resources. The full specification tests alternatively the impact of other variables ($Z_{i,t}$), such as inflation as a measure of macroeconomic stability, secondary school enrollment as a proxy of human capital accumulation, bank liquidity, bank profitability, and indicators of legal environment (quality of law and bureaucracy, corruption, and political stability). The model specification is as follows:

$$S_{i,t} = \lambda_0 + \lambda_1 * l\log(y_{i,t}) + \lambda_2 * Dep_{i,t} + B * Z_{i,t} + u_i + \varepsilon_{i,t} \tag{4}$$

where : u_i is an unobserved country-specific effect, and

                $\varepsilon_{i,t}$ is the error term.

B. Methodology and Results

Impact of short- and long-term credit on economic performance

To estimate the model, three estimators are used. First, we use a fixed-effect estimator to control for unobservable country-specific effects. Then, to control for endogeneity of financial development, the model is run with the System GMM estimator. Finally, if panel data are nonstationary, standard econometric methods may produce biased estimates, we therefore apply the Fully Modified Ordinary Least Square (FMOLS) estimator developed by Pedroni (2000).

Table 1 presents the results using the fixed-effect estimator. The evidence of growth convergence in the WAEMU is supported by the negative and significant sign for the initial level of GDP in all regressions. More importantly, financial development appears to stimulate growth, suggesting that WAEMU countries that promote the development of their financial sector grow faster than their peers. The significance of financial development, nevertheless, dies out when estimating the same model for 1989–95, which may explain why the findings of previous studies focusing on the pre-reform are mixed.[18]

When the private credit ratio is broken down into a short- and a long-term credit ratio, the results show that, as expected, long-term credit is more growth-enhancing than short-term credit. The coefficient for the long-term credit ratio is more than double that of the short-term credit ratio (column 4), implying that for a similar level of financial development, the larger

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[18] The results not presented in this paper are available upon request.

the share of long-term credit in total credit to the private sector, the more financial development contributes to a country's economic performance.[19]

Table 1. WAEMU: Impact of Short and Long-Term Credit and Economic Growth

	Fixed-Effects			
	(1)	(2)	(3)	(4)
Initial GDP per capita (log)	-0.450	-0.401	-0.406	-0.464
	(4.83)***	(4.28)***	(4.43)***	(4.85)***
Private credit/GDP	0.665			
	(2.21)**			
Short-term credit/GDP		0.563		0.590
		(1.69)*		(1.82)*
Long-term credit/GDP			1.285	1.325
			(2.10)**	(2.20)**
Education	0.001	0.001	0.002	0.001
	(1.04)	(1.13)	(1.87)*	(0.95)
Inflation	0.004	0.003	0.003	0.003
	(5.27)***	(3.85)***	(3.78)***	(4.07)***
Public expenditure/GDP	-0.003	-0.000	-0.002	-0.003
	(0.83)	(0.13)	(0.69)	(0.93)
Trade openness	0.001	0.001	0.001	0.001
	(1.22)	(1.22)	(1.38)	(1.67)*
Constant	2.379	2.114	2.122	2.431
	(4.52)***	(3.95)***	(4.07)***	(4.50)***
Observations	89	87	87	87
Number of countries	8	8	8	8
R-squared	0.40	0.35	0.37	0.39
Hausman test (chi 2)	131.6***	130.0***	30.0***	124.5***

Notes: Absolute value of robust *t* statistics in brackets; *** significant at 1 percent, ** significant at 5 percent, * significant at 10 percent.

Regarding the control variables, the results are weak partly due to low sample variability. The fact that inflation has a counter-intuitive sign could be explained by the low inflation rates in WEAMU countries thanks to the peg to the euro. This result is consistent with studies that noted a positive relationship between inflation and growth at some low rate of inflation, and a negative relationship as inflation is above a certain threshold (see for instance Khan and Senhadji, 2001). Human capital and trade openness are only marginally significant (see Table 1, columns 3 and 4).

Table 2 sets out the results using the System GMM approach to control for the endogeneity of financial development, measurement errors, and omitted variable bias. In particular, an improvement in growth prospects could stimulate long-term lending because of the higher returns associated with long-term investments undertaken to respond to an anticipated increase in aggregate demand. This will also increase operating costs, which explains why firm would need short-term loans.

[19] By including both short and long-term credit in the regression, we are controlling for the fact that more demand for long-term credit will also stimulate demand for short-term credit.

The System GMM developed by Blundell and Bond (1998) combines two set of equations. The first set takes first differences to remove unobserved time-invariant country-specific effects, and then the right-hand-side variables are instrumented by using levels of the series lagged one period or more. The second set uses the equations in levels with suitably lagged first differences as instruments. The Hansen test of over-identifying restrictions and the second-order serial correlation test (AR2) allow to test the validity of the lagged variables as instruments.

The results are broadly in line with those of the fixed-effects estimator except that the short-term credit ratio becomes insignificant. The long-term credit ratio continues to be strongly associated with economic growth in all regressions.[20]

Table 2. WAEMU: Impact of Short- and Long-Term Credit on Economic Growth, System GMM Estimates

	System GMM			
	(5)	(6)	(7)	(8)
Initial GDP per capita (log)	-0.189	-0.154	-0.219	-0.386
	(1.99)**	(2.12)**	(3.43)***	(2.62)***
Private credit/GDP	0.957			
	(1.20)			
Short-term credit/GDP		1.385		1.626
		(1.27)		(0.93)
Long-term credit/GDP			1.850	2.977
			(2.66)***	(2.00)**
Education	-0.000	0.000	0.000	-0.001
	(0.10)	(0.10)	(0.21)	(0.23)
Inflation	0.002	0.004	0.002	0.003
	(3.09)***	(3.02)***	(3.62)***	(1.78)*
Public expenditure/GDP	-0.004	-0.003	-0.009	-0.015
	(1.01)	(0.75)	(1.19)	(1.57)
Trade openness	0.001	0.001	0.001	0.001
	(1.00)	(1.17)	(0.59)	(0.66)
Constant	0.974	0.761	1.228	2.098
	(2.13)**	(2.48)**	(3.16)***	(2.85)***
Observations	89	87	87	87
Number of countries	8	8	8	8
Hansen test (prob.)	0.30	0.87	0.52	0.16
AR2 (prob.)	0.46	0.59	0.62	0.48

Notes: Absolute value of robust t statistics in brackets; *** significant at 1 percent, ** significant at 5 percent, * significant at 10 percent.

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[20] It is worth noting that the GMM System estimator might not be appropriate for our model because it is designed for panel data with large N (individuals/countries) and small T (time dimension). Also, the number of instruments quickly becomes large relatively to sample size; to avoid overfitting, we assume that initial GDP level is predetermined, financial development is endogenous, and other variables are exogenous. When all the explanatory variables are instrumented, the results are, however, similar except that the probability of the Hansen test is very close to 1.

These results also hold using the FMOLS estimator to deal with nonstationarity issues (Table 3). First, the panel unit root tests (Im-Pesaran-Shin, 2003, and Levin-Lin-Chu, 2002) suggest that all variables are I (1).[21] Then, we use the cointegration test developed by Pedroni (1999), and find that there is a cointegration relationship between real GDP growth rate, and the explanatory variables such as financial development, initial GDP per capita, and inflation.[22] Finally, the FMOLS estimator allows us to estimate the long-run relationship within the panel while allowing short-run dynamics and fixed effects to be heterogeneous among members of the panel (Pedroni, 2000). Further, it adjusts for the presence of endogeneity and serial correlation. Estimation of the long-run relationship between short- and long-term credit ratios and real GDP growth yields results that agree with the previous ones,[23] namely: (i) financial development has a positive impact on economic growth; and (ii) the bulk of the favorable impact of financial developments stems from long-term credit, because short-term credit is linked only weakly with economic growth.

Table 3. WAEMU: Impact of Short- and Long-Term Credit on Economic Growth—A Panel Cointegration Approach

	Fully Modified OLS			
	(1)	(2)	(3)	(4)
Initial GDP per capita (log)	-0.524	-0.362	-0.420	-0.643
	(7.04)***	(4.86)***	(7.21)***	(15.34)***
Private credit/GDP	0.691			
	(2.89)***			
Short-term credit/GDP		0.149		0.354
		(0.92)		(1.00)
Long-term credit/GDP			0.670	1.682
			(4.44)***	(13.50)***
Inflation	0.001	0.001	0.002	0.001
	(2.65)***	(1.43)	(1.21)	(0.22)
Observations	96	94	94	94
Number of countries	8	8	8	8

Notes: Absolute value of *t* statistics in brackets; *** significant at 1 percent, ** significant at 5 percent, * significant at 10 percent.

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[21] Given that there are some concerns about the power of panel unit root tests, the results from the fixed effect and System GMM estimator may still be relevant.

[22] For more details, see the panel unit root and cointegration tests in Annex 1. We are grateful to Peter Pedroni for sharing the code for the cointegration test.

[23] In estimating the long-run relationship, the model is restricted to the financial development and control variables that are consistently significant in the previous regressions (initial GDP per capita and inflation). This also makes it possible to minimize loss of data due to missing observations. However, including trade openness, education attainment, and government expenditure in the model does not change the quality of the results.

Determinants of the share of long-term credit in total credit to the private sector

In this section, we investigate the main factors behind bank provision of long-term credit to the private sector in the WAEMU. The results obtained using a fixed-effect estimator suggest that the availability of long-term resources (captured by the share of time deposit in total deposit) is strongly positively correlated with the ability of the banking system to supply long-term credit (Table 4).[24]

There is evidence for an inverted U-shaped relationship between inflation and the share of long-term credit in total credit; this tends to drop when the inflation rate exceeds a threshold of 4 percent.[25] With regard to legal and political variables, law and order has a positive sign but is not significant, but higher bureaucratic quality appear to stimulate long-term credit. One explanation of this may be that the indicator of law and order broadly measures the quality of the legal environment but fails to capture effective implementation of the law. WAEMU countries share the same legal environment, but implementation depends on the ability of national authorities to effectively enforce the law; the indicator of bureaucracy quality better captures this aspect.

In addition, as evidenced by the positive sign of the coefficient for ―freedom from corruption", widespread corruption undermines the effectiveness of the judicial system and weakens contract enforcement, thereby dampening the incentives for banks to finance long-term investment. Political stability, in contrast, creates an environment conductive to long-term bank financing; the coefficient is positive and significant.

Although as expected the coefficient for bank liquidity is negative, it remains nonsignificant at conventional levels, probably because we control for mobilization of long-term resources, the main channel through which bank liquidity discourages long-term financing. The results also reveal that healthy banks are more eager to provide long-term financing, as shown by the positive and significant coefficient for the return on assets.[26] Since inflation, bureaucracy, political stability, and corruption are the variables that add significant explanatory power to the model, we can conclude that, besides the availability of long-term resources, economic stability and strong institutions are the main factors contributing to increased long-term financing in WAEMU countries. The model explains at best 32 percent of the variability in the dependent variable, suggesting that some other variables we are not able to capture (access to international capital markets, size of the long-term government bond market, information asymmetry, etc) play an important role in shaping banks' ability to respond to private sector long-term borrowing need.

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[24] This is likely driven by the banking regulation which requires that banks finance long-term credit with long-term resources.

[25] This threshold has a standard deviation of 0.007, suggesting that the actual threshold lies between 2.8 percent and 5.6 percent at a 95 percent confidence interval.

[26] When we use return on equity (ROE), the coefficient is positive but only marginally significant at 12 percent.

Table 4. WAEMU: Determinants of the Share of Long-Term Credit in Total Credit

					Fixed-Effects						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
GDP per capita (log)	0.097	-0.009	0.143	0.140	0.177	0.133	0.325	0.357	0.090	0.197	0.276
	(0.83)	(0.07)	(1.09)	(1.11)	(1.44)	(1.15)	(2.07)**	(2.71)***	(0.77)	(1.33)	(1.88)*
Share of time deposits in total deposits[1]	0.633	0.568	0.525	0.564	0.734	0.669	0.678	0.549	0.642	0.744	0.583
	(2.28)**	(2.06)**	(2.00)**	(1.97)*	(2.51)**	(2.38)**	(2.39)**	(2.18)**	(2.30)**	(2.59)**	(2.11)**
Inflation		0.003	0.010								0.008
		(1.93)*	(3.60)***								(1.91)*
Inflation squared			-0.000								-0.001
			(2.99)***								(1.52)
Education				-0.001							
				(1.07)							
Law and order					0.003						
					(0.11)						
Bureaucracy quality						0.035					0.031
						(2.46)**					(2.13)**
Political stability							0.036				
							(1.90)*				
Freedom from corruption								0.003			0.002
								(2.74)***			(1.75)*
Liquid reserves to bank assets									-0.001		
									(0.78)		
Return on assets										0.017	
										(1.91)*	
Constant	-0.471	0.138	-0.709	-0.618	-0.973	-0.720	-1.759	-1.968	-0.428	-1.127	-1.541
	(0.69)	(0.19)	(0.93)	(0.87)	(1.32)	(1.07)	(1.94)*	(2.54)**	(0.62)	(1.29)	(1.81)*
Observations	90	90	90	89	78	78	61	80	90	80	69
Number of id	8	8	8	8	7	7	8	8	8	7	7
R-squared	0.06	0.11	0.20	0.07	0.10	0.17	0.21	0.23	0.07	0.13	0.32

Notes: Absolute value of *t* statistics in brackets; *** significant at 1 percent, ** significant at 5 percent, * significant at 10 percent. 1/ Time deposits include also savings deposits.

V. CONCLUSION AND POLICY RECOMMENDATIONS

This paper presents new evidence of the link between financial development and economic growth in the WAEMU for the postreform period (1995–2006) by distinguishing between the contributions of short- and long-term credit to economic growth. When we apply a variety of panel estimators, including fixed-effects, System GMM, and the recently developed FMOLS estimators, the results indicate that while financial development generally supports growth in the region, underpinning its favorable impact is long-term credit; short-term credit appears in most cases not to be correlated with growth. Considering that short-term credit accounts for about 70 percent of bank financing in the WAEMU, member countries are less able to reap the full benefit from improvements in their financial systems. In investigating the reasons for the minimal share of long-term credit in total credit, we find that macroeconomic stability, a creditor-friendly environment, political stability, and the availability of long-term financial resources are factors that encourage banks to provide long-term financing to firms.

WAEMU countries would therefore gain most from financial development by continuing to maintain a stable macroeconomic environment, strengthening the legal protections for creditors and effectively applying the laws. Along these lines, the 2007 WAEMU Financial System Stability Assessment (IMF, 2008) recommends aligning prudential norms better with best practices, better enforcing prudential norms, and improving the legal and judicial frameworks, and the quality of financial and accounting information. It also advocates loosening-up the regulation on the transformation ratio by taking into account demand deposits in the calculation of the transformation ratio. Not only will this improve compliance, but it will also increase banks' ability to extend long-term loans, while adequate supervision and regulatory framework should prevent banks from taking excessive risks. Opening up the banking system to foreign participation could also support bank mobilization of long-term resources. Moreover, measures to foster firms' access to long-term financing credit through other financial institutions should be considered. For instance, a vibrant regional capital market, and the development of nonbanking institutions, such as leasing companies and venture capital funds, could ease constraints on long-term financing for firms.
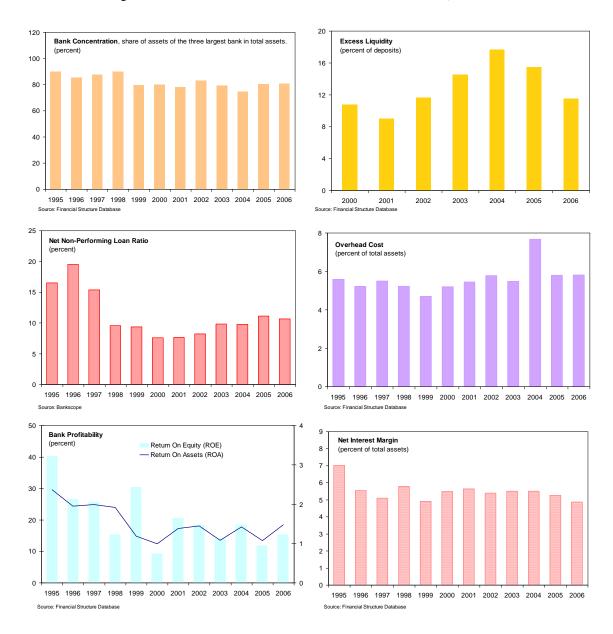
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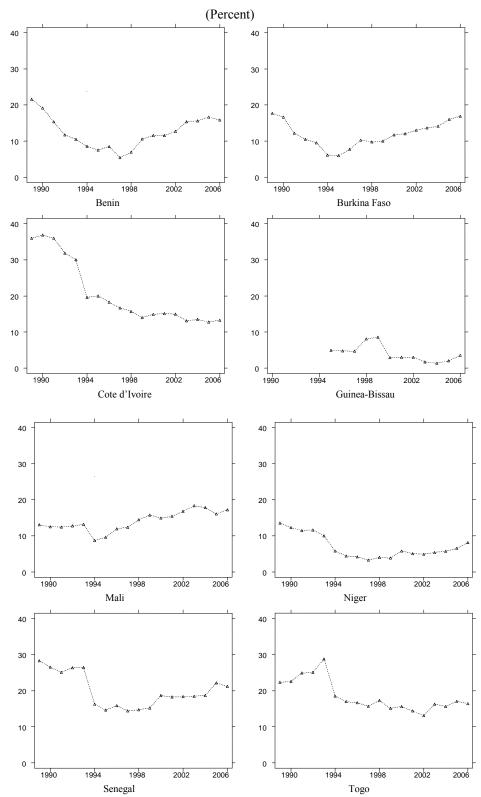
APPENDIX FIGURES

Figure A 1. WAEMU: Selected Financial Soundness Indicators, 1995–2006
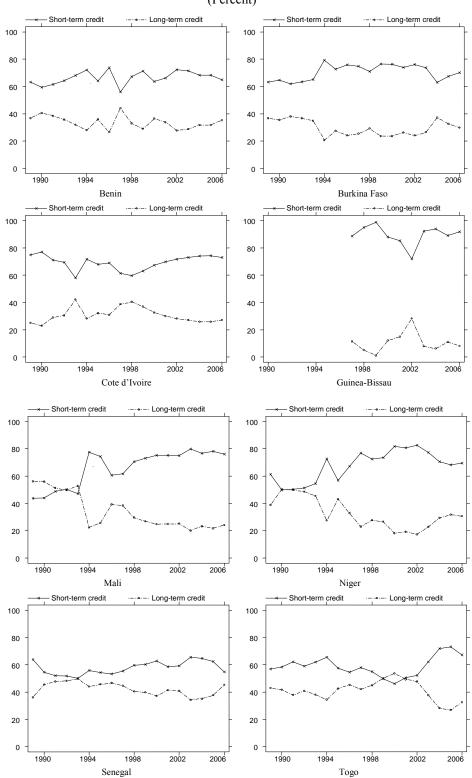

Bank Concentration, share of assets of the three largest bank in total assets. (percent)
Source: Financial Structure Database

Excess Liquidity (percent of deposits)
Source: Financial Structure Database

Net Non-Performing Loan Ratio (percent)
Source: Bankscope

Overhead Cost (percent of total assets)
Source: Financial Structure Database

Bank Profitability (percent)
Return On Equity (ROE)
Return On Assets (ROA)
Source: Financial Structure Database

Net Interest Margin (percent of total assets)
Source: Financial Structure Database

Figure A 2. WAEMU: Trend in Private Credit over GDP, 1989–2006

(Percent)

Source: IMF.

Figure A 3. WAEMU: Short and Long-Term Credit as a Share of Total Credit, 1989–2006

(Percent)

Benin

Burkina Faso

Cote d'Ivoire

Guinea-Bissau

Mali

Niger

Senegal

Togo

Source: The *Banque Centrale des Etats de l'Afrique de l'Ouest* (BCEAO).

Figure A 4. WAEMU: Sectoral Shares in GDP and Credit to Private Sector

Sources: National authorities, IMF, and BCEAO.

ANNEX 1. PANEL UNIT ROOT AND COINTEGRATION TESTS

To determine the presence of a panel unit root, we conduct Im-Pesaran-Shin (2003) and Levin-Lin-Chu (2002) tests. The test results are mixed; they depend on the test chosen and whether heterogeneous time trend is included in the specification. This may result from the low power of panel unit root tests in small samples. However, for all variables the unit root null could not be rejected at least in one of the four specifications (Table 1). The results regarding the panel unit roots tests for first differences show that taking the first difference wipes out the unit root in most cases (Table 2), suggesting that the series are generated by an I (1) process. These results enable us to test cointegration among variables in I (1) level.

Table 1. Panel Unit Root Tests (Level)

	Im-Pesaran-Shin Test		Levin-Lin-Chu test	
	Intercept	Intercept + Trend	Intercept	Intercept + Trend
Real GDP growth	0.04	0.23	0.12	0.10
Initial GDP per capita (log)	0.85	0.05	0.14	0.00
Private credit/GDP	0.88	0.00	0.15	0.00
Short-term credit/GDP	0.00	0.67	0.00	0.93
Long-term credit/GDP	0.77	0.56	0.00	0.00
Inflation	0.00	0.01	0.00	0.24

Notes: P-values are reported. A p-value higher than 0.10 indicates that the null hypothesis of nonstationarity could not be rejected.

Table 2. Panel Unit Root Tests (First Difference)

	Im-Pesaran-Shin Test		Levin-Lu test	
	Intercept	Intercept + Trend	Intercept	Intercept + Trend
Real GDP growth	..	0.00	0.00	0.00
Initial GDP per capita (log)	0.00	..	0.00	..
Private credit/GDP	0.01	..	0.69	..
Short-term credit/GDP	..	0.00	..	0.00
Long-term credit/GDP	0.01	0.16	..	..
Inflation	..	..	..	0.00

Notes: P-values are reported. A p-value higher than 0.10 indicates that the null hypothesis of nonstationarity could not be rejected.

Next we perform a panel cointegration test using the Pedroni (1999) procedure. The null hypothesis of no cointegration against the alternative of cointegration is tested using the

seven test statistics proposed by Pedroni (1999), which consist of four panel and three group test statistics. Six of the seven statistics point to the presence of a cointegrating relationship among real GDP growth rate, financial development indicators, initial GDP per capita, and inflation, indicating that the FMOLS estimator can be used to estimate the long-run relationship.

Table 3. Pedroni Panel Cointegration Tests

Test Statistic	Value
Panel υ-stat	-0.37
Panel σ-stat	2.22 **
Panel $\rho\rho$-stat	-4.66 ***
Panel ADF-stat	-4.79 ***
Group σ-stat	3.30 ***
Group $\rho\rho$ -stat	-5.53 ***
Group ADF-stat	-3.43 ***

Notes: Results with trend and time dummies. All tests reported here are distributed as N(0,1) under the null hypothesis of no cointegration. *** significant at 1 percent, ** significant at 5 percent.

ANNEX 2. SUMMARY STATISTICS AND CORRELATION MATRICES

Table 1. Summary Statistics

Variables	Observations	Mean	Std. Dev.	Min	Max
Real GDP growth	96	0.04	0.05	-0.33	0.13
GDP per capita (log)	96	5.58	0.45	4.90	6.50
Private credit/GDP	96	0.12	0.05	0.01	0.22
Short-term credit/GDP	94	0.08	0.03	0.01	0.15
Long-term credit/GDP	94	0.04	0.02	0.00	0.09
Secondary school enrollment Rate	95	51.19	15.18	25.13	82.22
Inflation	96	4.68	8.68	-3.50	50.73
Public expenditure/GDP	89	11.35	2.48	6.41	18.20
Trade openness	90	61.56	18.23	30.12	104.66
Civil liberties	88	3.88	1.11	2.00	6.00
Law and order	84	2.71	0.79	1.00	4.00
Share of long-term credit in total credit	94	0.34	0.12	0.01	0.58
Share of time deposits in total deposits	91	0.42	0.13	0.05	0.60
Bureaucracy quality	84	0.79	0.69	0.00	3.00
Political stability	64	-0.36	0.70	-2.45	1.04
Freedom from corruption	84	21.38	12.87	10.00	50.00
Liquid reserves to bank assets	96	13.26	12.57	2.64	107.72
Return on assets	84	1.52	0.97	-1.05	4.44
Return on equity	84	20.46	18.42	-49.15	116.82

Table 2a. Correlation Matrix (Eq. 1)

		1	2	3	4	5	6	7	8	9	10	11	12
Real GDP growth	1	1.00											
GDP per capita (log)	2	0.07	1.00										
Private credit/GDP	3	0.12	0.69	1.00									
Short-term credit/GDP	4	0.11	0.60	0.93	1.00								
Long-term credit/GDP	5	0.16	0.63	0.87	0.68	1.00							
Secondary school enrollment rate	6	-0.02	0.42	0.65	0.51	0.66	1.00						
Inflation	7	0.16	-0.10	-0.25	-0.19	-0.15	-0.13	1.00					
Public expenditure/GDP	8	0.08	-0.39	-0.21	-0.28	-0.17	-0.20	-0.35	1.00				
Trade openness	9	-0.07	0.32	0.31	0.21	0.32	0.49	-0.12	-0.25	1.00			
Civil liberties	10	-0.24	0.03	-0.11	-0.17	0.01	-0.01	0.04	-0.14	0.42	1.00		
Law and order	11	0.27	0.38	0.58	0.52	0.50	0.17	-0.38	0.15	-0.10	-0.25	1.00	
Political stability	12	0.41	-0.26	0.05	0.02	0.09	-0.10	-0.05	0.29	-0.55	-0.77	0.32	1.00

Table 2b. Correlation Matrix (Eq. 4)

		1	2	3	4	5	6	7	8	9	10	11	12
Share of long-term credit in total credit	1	1.00											
GDP per capita (log)	2	0.48	1.00										
Share of time deposits in total deposits	3	0.77	0.60	1.00									
Inflation	4	0.03	-0.10	-0.05	1.00								
Secondary school enrollment rate	5	0.41	0.42	0.30	-0.13	1.00							
Law and order	6	0.41	0.38	0.54	-0.38	0.17	1.00						
Bureaucracy quality	7	0.01	0.17	-0.06	0.12	-0.34	-0.06	1.00					
Political stability	8	0.14	-0.26	0.00	-0.05	-0.10	0.32	0.20	1.00				
Freedom from corruption	9	0.43	0.65	0.43	0.06	0.21	0.24	0.37	0.12	1.00			
Liquid reserves to bank assets	10	-0.46	-0.39	-0.56	0.09	-0.03	-0.31	-0.03	0.01	-0.25	1.00		
Return on assets	11	0.20	-0.22	0.04	0.21	-0.06	0.25	0.09	0.08	-0.07	-0.16	1.00	
Return on equity	12	0.20	0.01	0.10	0.24	-0.03	0.22	0.20	0.11	0.08	-0.22	0.65	1.00

ANNEX 3. VARIABLE DEFINITION AND SOURCES

Variables	Definitions	Sources
Real GDP growth	Annual change in real gross domestic product	
GDP per capita (log)	Nominal gross domestic product divided by the size of the population.	
Private credit/GDP	Private credit by deposit money banks to GDP	
Inflation	Change in consumer price index (CPI).	*International Financial Statistics*
Public expenditure/GDP	Government current expenditure as a share of GDP	
Time and savings deposits	Deposits with banks that require a prior notice for withdrawal	
Liquid reserves to bank assets	Ratio of domestic currency holdings and deposits with the monetary authorities to claims on other governments, nonfinancial public enterprises, the private sector, and other banking institutions.	
Short-term credit/GDP	Short-term credit to private sector by deposit money banks to GDP	*Banque Centrale des Etats de l'Afrique de l'Ouest*
Long-term credit/GDP	Medium and long-term credit to private sector by deposit money banks to GDP	
Secondary school enrollment rate	Ratio of total enrollment in secondary school, regardless of age, to the population of the age group that officially corresponds to the secondary level of education.	*World Development Indicators*
Trade openness	Sum of total export and total import as a share of GDP	
Civil liberties	Civil liberties are measured on a one-to-seven scale, with one representing the highest degree of freedom and seven the lowest.	*Freedom House Database*
Law and order	Law and Order is an assessment of the strength and impartiality of the legal system, and popular observance of the law. It ranges from 0 to 6, where a higher number indicates a better system of law and order.	*International Country Risk Guide*
Bureaucracy quality	An index capturing the ability of the bureaucracy to minimize revisions of policy when governments change.	*Political Risk Services Database*
Political stability	It measures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism. The values lie between -2.5 and 2.5, with higher scores corresponding to better outcomes	*Kaufmann, Kraay, and Mastruzzi (2007)*
Freedom from corruption	This index measures the degree to which corruption is perceived to exist among public officials and politicians. It ranges from 0 to 100, with higher values indicating low corruption.	*Heritage Foundation Database*

(continued…)

Variables	Definitions	Sources
Return on assets	Annual net income divided by average assets	
		Bankscope
Return on equity	Annual net income divided by shareholders' equity	