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Financial Development and Poverty: Evidence from the CFA Franc Zone

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Abstract

The financial liberalization in the 1980s and the early 1990s led the CFA Franc Zone countries to deepen reforms in their financial systems. These reforms fostered financial development, which in turn may have reduced income poverty, as emphasized by several theoretical arguments in the literature. This study aims at estimating the contribution of financial development to poverty alleviation in CFA Franc Zone. Results based on a panel of CFA Franc Zone countries show that financial development is associated with a drop in the proportion of poor population. Next, financial development reduces the extent to which the income of individuals falls below the poverty line. Moreover, in some cases, the effect of financial development on poverty may be subject to nonlinearities. Finally, financial instability or unstable financial development leading to crises may mitigate the favourable effect of financial development on poverty reduction. These findings are robust to the use of alternative measures of financial development and hold after controlling for a potential simultaneity and a small sample biases.

Keywords: Financial Development, Poverty, CFA Franc Zone.

JEL classification: O11, G00, O16.

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1 Introduction

In most CFA Franc Zone countries the overall situation of the underprivileged populations has deteriorated over the past decades. Between 1981 and 1993, the population living below the poverty line (corresponding to less than \$ 1.25 per day, according to the World Bank) increased from 46.95% to 52.47% of the total population of the CFA Franc Zone. These facts are confirmed by the analysis of social indicators of countries in the region, as in 2010 the average Human Development Index (HDI) of these countries equals 0.390, largely below its value for all developing countries (0.586) and for the whole world (0.624).

In this context, the fight against poverty became a priority for policy-makers in the CFA Franc Zone, especially since the adoption of the Millennium Development Goals (MDGs). This shift in the development strategy, based on the fight against poverty, increased the interest on the contribution of financial development in reducing poverty. Such a potential role for financial development arises from an important literature emphasizing several theoretical arguments,¹ predicting that it may have a reducing impact on income poverty, directly or indirectly through its effect on economic growth.

In the debate on the contribution of finance to development, most studies restrained to the relationship between financial development and economic growth (see, for instance, [Bencivenga & Smith, 1991](#); [King & Levine, 1993](#); [Levine, 1997](#); [Rajan & Zingales, 1998](#); [Levine & Loayza, 2000](#)). Indeed, the underlying idea was that the development of the financial system should not have any effect on the income of the poor, but an *indirect* effect through higher economic growth, since the poor do not have access to financial services.² However, given that in many developing countries the distribution of income appears to be highly skewed in favour of the richest population who is a minority ([World Bank, 1995](#)), a positive effect of financial development on growth is not likely to imply a poverty reduction, as emphasized by [Beck *et al.* \(2007\)](#).

Consequently, a growing literature focused on the *direct* impact of financial development

¹These arguments are mainly the McKinnon's "conduit" effect and the Shaw's "intermediation" effect, and they are detailed in the next section.

²For example, [Greenwood & Jovanovic \(1990\)](#) assert that the access of poor people to bank credit can be hindered by high costs of small loans.

on poverty (see, for instance, [Honohan, 2004](#); [Jalilian & Kirkpatrick, 2005](#); [Beck *et al.*, 2007](#); [Guillaumont & Kpodar, 2011](#); [Kiendrebeogo & Minea, 2013](#)). These studies show that financial development may be particularly important for the poor.³ Indeed, by improving efficiency in the mobilization and allocation of savings, the monitoring in the use of funds, the managing risks, and by providing increased productivity of financial intermediaries and access to microcredit for the most disadvantaged social strata, the development of the financial sector can provide adequate financial services to the poor and thus significantly contribute to decrease poverty.

However, despite their wealth, these empirical studies present a number of limitations. The first relates to the sample composition, as in most cases the sample is made on the basis of data availability on poverty. Since household survey data are not available for relevant periods for most developing countries, the sample mixes both developing and developed countries (see, for instance, [Jalilian & Kirkpatrick, 2005](#); [Beck *et al.*, 2007](#)). Unfortunately, this can lead not only to a sample heterogeneity problem, but also, and more importantly, to a selection bias consisting to the fact that countries that present data on poverty are those with strong institutions and therefore are likely the least poor countries. Second, many studies use of the broad money stock, namely usually M2 and M3, as a measure of financial development (see, for instance, [Akhter & Daly, 2009](#); [Guillaumont & Kpodar, 2011](#); [Perez-Moreno, 2011](#)). However, the extent to which these ratios, reporting a wide measure of money supply, capture the McKinnon’s “conduit” effect can be questioned, since the conduit effect makes reference to individual financial savings, and in developing countries the broad money stock is essentially held outside the banking system.

The goal of this article is to examine the relationship between financial development and poverty in a panel data analysis that accounts for the issues encountered by previous work on this topic. First, we focus exclusively on the direct impact of financial development on income poverty in a sample of CFA Franc Zone countries. By so doing, not only our article provides an analysis of a possible direct effect of financial development on poverty in the CFA Franc Zone, but we equally mitigate both the sample heterogeneity and the

³With the notable exception of [Arestis & Caner \(2010\)](#) who fail to find a significant effect of capital account liberalization on poverty in developing countries.

selection bias. Indeed, CFA Franc Zone countries display comparable levels of development, experienced essentially the same reforms in their financial systems in the 1980s and the 1990s, and adopted similar monetary and financial policies anchored to the monetary policy of the Bank of France or, latter, of the European Central Bank. Second, we employ alternative measures of financial development that better take into account McKinnon's conduit effect, namely the ratio of bank deposit liabilities to GDP,⁴ as well as additional measures of poverty, namely the poverty gap index. Finally, our study controls for both the possible endogeneity of financial development and for the small sample bias that may arise from using a reduced number of countries.

Our findings are the following. First, irrespective of the measure used, financial development is robustly and significantly associated with a drop in the poverty headcount. Second, financial development reduces the extent to which the average income of individuals may fall below the income defining the poverty line. Third, the favourable effect of financial development on poverty is sometimes subject to nonlinearities. Indeed, a certain development of the credit activity is needed before the gap between rich and poor starts decreasing. Finally, financial instability or unstable financial development leading to crises may mitigate the favourable effect of financial development on poverty reduction. Our findings contribute to the literature on the determinants of poverty in the CFA Franc Zone, by showing that financial development exerts a direct effect on poverty. Consequently, the design of monetary and financial policies in this zone should account for the role of financial development, which could be a virtuous tool to alleviate poverty.

The rest of the article is organized as follows. Section 2 describes the institutional background of the CFA Franc Zone, Section 3 presents the theoretical and empirical arguments of the direct relationship between financial development and poverty, Section 4 describes the econometric strategy, Section 5 provides estimates of the impact of financial development on poverty in the CFA Franc Zone, Section 6 analyses the robustness of our main results, and Section 7 concludes.

⁴ Compared to the cross-section study of [Kiendrebeogo & Minea \(2013\)](#) that employs indicators of financial access, this financial indicator allows performing a panel analysis that precisely explores time-variability of data for assessing the financial development-poverty relationship in the CFA Franc Zone.

2 Institutional background

The CFA Franc Zone is a monetary area including 15 Sub-Saharan African (SSA) countries: Benin, Burkina Faso, Ivory Coast, Guinea Bissau, Mali, Niger, Senegal and Togo from the West African Economic and Monetary Union (WAEMU); Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea and Gabon from the Economic Community of Central African States (ECCAS); and Comoros.⁵ This zone is characterized by a common exchange rate mechanism: the two monetary unions and Comoros share the same currency, the CFA Franc, with the Euro as the anchor currency.⁶ Three central banks are at the heart of this monetary cooperation: the Bank of Central African States of the ECCAS, the Central Bank of West African States of the WAEMU, both created in 1959, and the Central Bank of the Comoros, which replaced the issuing bank of the Comoros in 1981. During the 1980s and early 1990s these CFA Franc Zone countries implemented reforms to promote financial sector development.

There are four fundamental principles governing this monetary cooperation: (i) unlimited convertibility guarantee from the French Treasury, (ii) fixed parities, (iii) free transferability, and (iv) centralization of foreign exchange reserves. Against this guarantee, the three central banks are required to deposit part of their foreign exchange reserves on an “operating” account with the French Treasury. For each of these three central banks, a monetary policy committee, chaired by the Governor, is in charge of defining the conduct of monetary policy and its instruments. As a result, there has been a certain degree of homogeneity across countries within the zone, particularly with respect to the conduct of monetary policy. As illustrated by Figures 1 and 2 in the Supplementary Material, financial development indicators display comparable time-patterns across countries in the zone; this is a reflection of the common institutional framework and the adoption of similar financial sector reforms in the CFA Franc Zone over time. However, these comparable patterns hide a certain heterogeneity: for both financial indicators, the level of financial development varies substantially across countries within the CFA Franc Zone.

⁵ WAEMU and ECCAS monetary unions were founded in 1994.

⁶ The CFA Franc was anchored to the French Franc until 1 January 1999.

From the SSA perspective, the level of financial development of CFA Franc countries is lower than that of non-CFA Franc countries, particularly from 1990 onwards (see Figure 3 in the Supplementary Material). This fact is often viewed as an illustration of the legal origin of financial development: French civil law countries tend to have least developed capital markets, especially as compared to common law countries (see, for instance, [La Porta *et al.*, 1998](#)).⁷ This relatively lower level of financial development is yet an additional motivation for our analysis, as there is more room for finance-driven poverty reduction in the CFA Franc Zone than in non-CFA Franc SSA countries.

3 Financial development and poverty: a review of theory and empirical evidence

3.1 A review of theory

The literature distinguished mainly two arguments that can justify a direct impact of financial development on poverty, namely the McKinnon “conduit” effect and the Shaw “intermediation” effect.

3.1.1 The McKinnon’s “conduit” effect

Financial saving is the fundamental element in the analysis of [McKinnon \(1973\)](#). The starting point is a domestic capital market in which market infrastructures and information are weak. Due to the lack of access to external financing and the indivisibility of investment, agents, modelled as small-size firm-households, have few incentives to accumulate additional capital. Indeed, in this context in which self-financing investments are of a considerable importance, poor people are in a situation in which it is more convenient to accumulate

⁷ This argument will motivate the choice of the instrumental variable for financial development in the empirical strategy (see section 4). Another explanation of the cross-country variation in financial development in SSA is related to oil production: financial institutions tend to be weaker in oil than in nonoil economies (see, for instance, [Nili & Rastad, 2007](#)). Consistent with [Nili & Rastad \(2007\)](#), Figure 4 in the Supplementary Material suggests that SSA oil economies are on average less financially developed than nonoil economies, especially starting the 1990s. Related to our sample, WAEMU countries tend to be more financially developed than ECCAS countries, the latter including some top African oil producers (see Figure 5 in the Supplementary Material).

funds in monetary assets until they have enough resources to invest in higher-yielding physical assets. Given the lack of access to financial saving, these monetary assets are weakly remunerated, with a negative consequence on the wealth (and the investment) of agents.⁸ In such a context, the establishment of appropriate financial structures facilitates the setting up of financial saving, since saving is better remunerated. As a result, a higher level of financial development increases the wealth and the opportunities of self-financing for the poor people.

3.1.2 The Shaw’s “intermediation” effect

Unlike McKinnon, who focuses on the effect of the financial sector on the supply of resources, i.e. financial saving, [Shaw \(1973\)](#) looks at the effect of the financial sector on the distribution of resources, i.e. credit activities. According to [Shaw \(1973\)](#), a situation of financial repression takes the form of an administrative setting of nominal interest rates below their competitive equilibrium value, usually accompanied by high inflation rates due to the willingness of authorities to collect seigniorage (the inflation tax), and resulting weak (or even negative) real interest rates. Since savings are considered to be increasing in the real interest rate, these low interest rates engender a lack of savings, and moreover of investment, since investment is conditioned by the amount of savings collected by the financial sector. As a result, the adverse consequences in terms of degradation of living conditions of the individuals are numerous: *(i)* outflows of domestic capital, in search for higher remuneration, that limit the supply of loanable funds for less wealthy investors; *(ii)* an artificially low real interest rates which makes the self-financing a dominant phenomenon; *(iii)* rationing of bank credit due to a lack of resources; *(iv)* substitution of labour by capital (unemployment) because of low real interest rates; *(v)* agents are forced to finance themselves on informal financial markets that are only imperfect substitutes for formal financial markets. Consequently, as emphasized by [Shaw \(1973\)](#), financial deepening facilitates access to credit, which in turn can have a direct effect on the poor population.

⁸Notice that in this case investment financing implies a sacrifice in terms of consumption, since there is a complementarity between money and physical capital, instead of the traditional substitution among them.

3.2 A review of the evidence linking finance and poverty

The empirical literature examining the impact of financial sector development on poverty is scarce, mainly given the lack of cross-country reliable data.⁹ An early study aiming at answering this question is [Honohan \(2004\)](#). Using cross-country data for 76 countries, the author finds that a 10% increase in the ratio of private credit to GDP should reduce poverty ratios by 2.5 to 3 percentage points. [Jalilian & Kirkpatrick \(2005\)](#) examine the link between financial development and poverty reduction in 42 countries, including 26 developing countries, from a wider perspective accounting for the interaction between financial development, economic growth, inequality and poverty. Their findings back up the conclusions of [Honohan \(2004\)](#), since an increase in the ratio of private credit to GDP improves the growth prospects of the income of the poor in developing countries. Using the same measure of financial market development as [Jalilian & Kirkpatrick \(2005\)](#), namely the ratio of private credit to GDP, in a cross-section analysis covering the period 1960-2005, [Beck et al. \(2007\)](#) show that financial development increases the income of the poor relatively more compared to the increase of the average per capita income, which reduces poverty rates. Besides, they find that financial development is associated with a drop in the fraction of the population living below the poverty line, a result backed-up by the analysis of [Akhter & Daly \(2009\)](#) performed for a sample of 54 developing countries over the period 1993-2004 and by the cross-section analysis of [Perez-Moreno \(2011\)](#). In addition, [Guillaumont & Kpodar \(2011\)](#) draw upon a sample of developing countries for the period 1966-2000 and show that financial development, measured by the private credit to GDP ratio and by the M3 to GDP ratio, improves the average income of the poorest 20% households of the countries considered.

On the whole, this literature supports a favourable effect of financial development on poverty.¹⁰ Nevertheless, a limitation of most of these studies is the use of traditional

⁹One alternative to compensate for the lack of cross-country poverty data is to perform country-studies. For example, [Burgess & Pande \(2005\)](#), using data on rural banks in India, shows that a 1% increase in the number of bank branches in rural unbanked locations in India was associated with a rural poverty reduction of 0.34% (see also the analysis of [Odhiambo \(2009\)](#) performed for South-Africa). However, one of the limits of country-studies is the well-known external validity problem.

¹⁰Alternatively, there exists an important literature focusing on the specific relationship between financial development and inequality. [Greenwood & Jovanovic \(1990\)](#) defended an “inverted-U” curve between the

indicators of financial development, which appropriately capture the indirect impact of financial development on poverty through economic growth, but are less adequate to reflect the direct impact of increased access to financial services by the poor, all the more in developing countries where the broad money stock is essentially held outside the banking system. The following section attempts to further deepen these issues in the case of CFA Franc Zone countries.

4 Empirical Strategy

4.1 Econometric Model

As previously emphasized, we consider that an eventual effect of financial development on poverty transits through two channels, namely the McKinnon's conduit effect, based mainly on access to saving services, and the Shaw's intermediation effect, which focuses on the access to credit. To measure these effects, we extend the specification of [Beck *et al.* \(2007\)](#) to a panel setup, and regress the growth rate of the poverty indicator on the measure of financial development and a set of explanatory variables that are supposed to influence poverty

$$Poor_{i(t+1)} - Poor_{it} = a_0 + a_1 Poor_{it} + a_2 Finance_{it} + AX_{it} + u_i + v_t + \epsilon_{it}, \quad (1)$$

where $Poor_{it}$ and $Finance_{it}$ are the indicators of poverty and financial development respectively, X_{it} is a set of control variables assumed to affect poverty, u_i and v_t are country

evolution of the financial system and income inequality, by showing that the development of the former is initially associated with high levels of inequality (initially, the services offered by financial intermediaries do not benefit poor people because they are excluded from the market, while poor people have access to such services as the financial system develops). However, these results are questioned by [Clarke *et al.* \(2002\)](#), who failed to identify such an inverted-U curve on a sample of 91 countries over the period 1960-1995, but instead find that financial development reduces inequality even in the early stages of the evolution of the financial system, confirming previous conclusions of [Banerjee & Newman \(1993\)](#) or [Dollar & Kraay \(2001\)](#) (see also the survey of [Demirguc-Kunt & Levine \(2009\)](#)). When it comes to the transmission channels, [Beegle *et al.* \(2003\)](#) or [Dehejia & Gatti \(2005\)](#) look at the links between financial sector development, child labour and education, and show that access to financial services could enable poor households to diversify their income, leading to a reduction of child labour and an increase in school enrolment at the aggregate level (see [Claessens & Perotti \(2007\)](#) for an overview of the transmission channels between financial development and inequality).

and time fixed effects controlling for fixed effects common across countries and for business cycle effects, respectively, ϵ_{it} is an idiosyncratic error term and $t + 1$ stands for the next three-year sub-period. The resulting sample is unbalanced and the number of observations varies with respect to the data availability (see Table 8 in the Supplementary Material).

4.2 Identification Strategy

We identify several econometric problems that may arise in the estimation of our model. First, despite considering several control variables and the use of country and time fixed effects, it is likely that remained unobserved characteristics may affect poverty. Second, as we estimate an equation of poverty, it is likely that there are potentially endogenous regressors; this may be particularly the case for the indicator of financial development and for the GDP per capita growth. Finally, as this could be the case for the indicator of financial development, observing one or more regressors with measurement errors could disrupt the identification of the coefficients to be estimated.

To mitigate the estimation biases emphasized above, several strategies can be employed. One of the most common techniques to address a possible endogeneity of regressors is the Fixed Effects Two-Stage Least-Square (FE-2SLS). This estimator allows taking into account unobserved heterogeneity which could affect the level of poverty; however, its performances are intimately related to the quality of the instrumental variables. For example, to analyse the influence of financial development on economic growth, financial development was instrumented by variables such as the legal origin, the religious composition, the legal rights of secured creditors, and indicators of institutional quality (see, for example, [Beck *et al.* \(2000\)](#) or [Levine & Loayza \(2000\)](#)). Unfortunately, most of these variables are not available for wide time periods for developing countries, and particularly for CFA Franc Zone countries, while institutional variables are often time-invariant. Consequently, we adopted the following strategy: on the one hand, we instrument financial development with the Freedom House Political Rights Index, which is supposed to be strongly correlated with our indicators of financial development, but with no direct impact on the indicator of poverty (except indirectly through financial development). On the other hand, all control variables were instrumented using their one period-lagged value.

In addition, our results could be polluted by the small sample problem, arising from the presence of a relatively reduced number of countries. To mitigate this problem, we use the Bias corrected LSDV dynamic panel data technique. This technique was found to often outperform other dynamic panel estimations, such as System-GMM, in terms of bias and roots mean square error (RMSE), especially when the number of cross-sectional units is small (Bruno, 2005), which is precisely the case of our analysis performed on the CFA Franc Zone countries.¹¹

4.3 Data

Our main sample is composed of 13 CFA Franc Zone countries observed over the period 1981-2010 (see Appendix 1 in the Supplementary Material for the list of countries). This period was divided into 10 sub-periods of 3 years each to match the availability of data on income poverty; consequently, the indicators of poverty take their value of the considered period. The other variables are averaged over each sub-period, to smooth short-run variations. In the following we present our indicators of financial development and of poverty, and the main control variables.

Our dependent variable, i.e. income poverty, is measured using the poverty headcount (H0), defined as the proportion of the population living below the poverty line (according to the World Bank, we consider a monthly poverty line of \$ 1.25 per day; see Tables 7 and 8 in the Supplementary Material for data definitions and sources, and descriptive statistics, respectively). The advantage of this indicator is to render our results comparable with previous studies on the relationship between financial development and poverty (see, for example, Honohan (2004), Beck *et al.* (2007) or Akhter & Daly (2009)). However, as emphasized by Ravallion & Bidani (1994), its main weakness is that it does not take into account any improvement or deterioration of the income of a poor person, as long as this person remains below the poverty line. To control for this problem, we follow Kiendrebeogo & Minea (2013) and use alternatively the poverty gap index (H1), which measures the extent to which the income of individuals falls below the poverty line as a proportion of the poverty

¹¹In particular, notice that the use of a relatively reduced number of countries prevented us from using System-GMM estimators to control for the possible endogeneity of the financial development.

line.¹²

Regarding the main explanatory variables, we measure financial development by the private credit to GDP ratio, in order to account for the Shaw's intermediation effect and to make our results comparable with previous studies. In addition, related contributions, including [Akhter & Daly \(2009\)](#) or [Guillaumont & Kpodar \(2011\)](#), use different measures of the broad money stock, usually the ratios of M2 and M3 to GDP, to account for the McKinnon's conduit effect. However, the extent to which these broad money supply ratios capture the conduit effect can be questioned, since this effect focuses on individual financial savings and in developing countries the broad money stock is essentially held outside the banking system. Consequently, we account for the McKinnon's conduit effect using the ratio of bank deposit liabilities to GDP, which captures more accurately private financial savings.¹³

Finally, control variables were chosen such as to make our results comparable with previous studies on income poverty. Following [Jalilian & Kirkpatrick \(2005\)](#), [Beck *et al.* \(2007\)](#), [Akhter & Daly \(2009\)](#) and [Guillaumont & Kpodar \(2011\)](#), we control for the GDP per capita growth and the initial level of school enrolment to account for the effect of economic growth and education on poverty, while we capture the influence of trade integration and of the quality of the macroeconomic environment using trade openness and inflation respectively. In addition, for robustness issues, we use the age dependency ratio and population growth to seize the structure of the population and its dynamics.

5 Results

The choice of the measure of poverty is of course of crucial importance. As previously stated, we alternatively use two measures of poverty, namely the poverty headcount index (H0) and the poverty gap index (H1). Before presenting the results, notice that first-

¹²Other studies on this topic measure poverty by the growth of the income of the poor population ([Jalilian & Kirkpatrick, 2005](#)) or the average income of the poor population ([Guillaumont & Kpodar, 2011](#)). The only reason for which we do not account for poverty with these variables is data availability.

¹³Alternatively, [Kiendrebeogo & Minea \(2013\)](#) draw upon microeconomic measures of financial development, such as the number of deposit accounts or banking credits per capita; unfortunately, such data became available only recently and only for a limited number of countries, making their use unfeasible for our panel analysis devoted to CFA Franc Zone countries.

(Maddala & Wu (1999)) and second-generation (Pesaran (2007)) panel unit root tests, performed alternatively with intercept, and with intercept and trend, show that our main variables are stationary (see Tables 10 and 11 in the Supplementary Material), consistent with the fact that the use of three-year nonoverlapping sub-periods smooths out sub-period cyclical factors.

5.1 Poverty measured by the poverty headcount (H0)

The poverty headcount index (H0) has the advantage of being available for many countries over a long period, explaining why it was widely used in the literature to estimate the relationship between financial development and poverty (see, for instance, Honohan (2004) and Beck *et al.* (2007)). The results are presented in Table 1. Let us first focus on the left side of Table 1, namely regressions (1)-(6) performed using the FE-2SLS technique. Remark that the Hansen over-identification test supports the validity of our instrumental variables at conventional levels of significance for all regressions (1)-(6). In addition, instrumentation regressions reported in Table 9 in the Supplementary Material indicate that our instrument is a good predictor of financial development, both for private credit (column 1) and for bank deposit liabilities (column 2).

To compare our results with previous studies, we perform in columns 1-3 of Table 1 several regressions using the private credit to GDP as a measure of financial development. According to regression (1), an increase in the ratio of private credit to GDP significantly decreases the growth rate of the poverty headcount index for the countries of the CFA Franc Zone. This effect holds when controlling for the effect of GDP per capita growth and for initial H0 in regression (1), for initial primary schooling, trade openness and inflation in regression (2), and for the age dependency ratio and population growth in regression (3). Regarding these control variables, the negative and significant coefficient of initial H0 is consistent with the phenomenon of convergence in poverty levels in CFA Franc Zone countries, while more economic growth and trade openness are poverty-reducing, contrary to a higher share of dependent population and increasing population.

Thus, according to our findings, a 1 percentage point increase in the private credit to GDP ratio decreases the growth rate of the poverty headcount index by a value between

Table 1: Financial development and changes in the poverty headcount index (H0)

Dependent variable : Growth of H0	FE-2SLS						Bias corrected LSDV dynamic panel					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Growth of H0 (-1)												
Initial H0	-0.072*** (0.010)	-0.072*** (0.012)	-0.076*** (0.012)	-0.069*** (0.009)	-0.071*** (0.016)	-0.072*** (0.016)	0.348*** (0.134)	0.359** (0.164)	0.305** (0.154)	0.336** (0.134)	0.364** (0.159)	0.301* (0.154)
Private credit	-0.364** (0.156)	-0.495*** (0.168)	-0.228*** (0.044)				-0.061*** (0.014)	-0.063*** (0.019)	-0.070*** (0.019)	-0.057*** (0.014)	-0.064*** (0.019)	-0.071*** (0.018)
Bank deposit liabilities				-0.657** (0.311)	-0.749** (0.327)	-0.661* (0.339)				-0.306** (0.140)	-0.480*** (0.102)	-0.377*** (0.056)
GDP per capita growth	-1.814*** (0.598)	-2.775*** (0.393)	-1.601** (0.744)	-1.965*** (0.425)	-1.959*** (0.618)	-2.805* (1.509)	-1.629*** (0.423)	-1.606* (0.877)	-1.955** (0.908)	-3.112*** (0.980)	-2.153*** (0.987)	-0.914** (0.419)
Initial primary schooling		-0.026 (0.096)	-0.036 (0.095)		-0.031 (0.103)	-0.048 (0.098)		-0.079 (0.142)	-0.065 (0.137)		-0.071 (0.140)	-0.060 (0.135)
Trade openness		-0.402*** (0.047)	-0.355*** (0.055)		-0.520* (0.284)	-0.503 (0.681)		-0.152* (0.081)	-0.376*** (0.200)		-0.257** (0.110)	-0.463*** (0.198)
Inflation		0.193 (0.147)	0.229 (0.160)		0.229 (0.144)	0.264 (0.162)		0.059 (0.379)	0.147 (0.369)		0.188 (0.371)	0.161 (0.363)
Age dependency			0.251* (0.144)			0.265* (0.152)			0.163* (0.089)			0.164* (0.088)
Population growth			0.024*** (0.004)			0.048* (0.026)			0.088* (0.046)			0.093** (0.043)
Constant	-2.206*** (0.460)	-2.018*** (0.640)	-2.420*** (0.629)	-6.992** (3.205)	-5.894* (3.044)	-3.303*** (0.438)						
Observations	91	83	83	91	83	83	91	83	83	91	83	83
Number of countries	13	13	13	13	13	13	13	13	13	13	13	13
Hansen OID p-value	0.657	0.259	0.693	0.163	0.266	0.580						

Robust standard errors (column 1-6) and bootstrapped standard errors (column 7-12) in parentheses; *significant at 10%; **significant at 5%; ***significant at 1%. Growth of H0 (-1) is the one three-year sub-period lagged value of the growth rate of H0. Instrumentation regressions for columns 3 and 6 are presented in the first two columns of Table 9 in the Supplementary Material. For the Bias corrected LSDV estimator, the bias correction is initialized by the standard Blundell-Bond System GMM estimator with no intercept.

0.2 and 0.5 percentage points. This larger magnitude compared to previous studies (see, for example [Beck *et al.* \(2007\)](#)) could be explained by the following. First, we use panel data, instead of cross-section data. Second, drawing upon FE-2SLS allows controlling for the simultaneity bias between financial development and poverty. Finally, performing our estimations on a sample composed exclusively of African developing countries that are part of the CFA Franc Zone allows better controlling for the heterogeneity bias. Consequently, our results extend previous findings by showing that the effect of financial development (measured by the private credit to GDP ratio) on reducing poverty (measured by the growth of the poverty headcount index) is remarkably strong for the CFA Franc Zone countries from our sample.

Let us now turn our attention to the second measure of financial development, namely the ratio of bank deposit liabilities to GDP. Remark that accounting for this variable in columns 4-6 of Table 1 does not alter the effect of control variables on the growth rate of H_0 . More importantly, a higher ratio of bank deposit liabilities to GDP is always found to significantly decrease the growth rate of the poverty headcount index. Consequently, in addition to the favourable effect of the private credit ratio to GDP, which could reproduce Shaw's intermediation effect, our analysis emphasizes the presence of a robust McKinnon conduit effect, captured by the bank deposit liabilities ratio, in the relation between financial development and poverty.

One critique of our findings could concern the small sample bias, arising from the use of relatively few countries. To tackle this issues, we present in columns 7-12 of Table 1 estimations performed using the Bias corrected LSDV dynamic panel technique. Compared to FE-2SLS, these estimations do not exhibit qualitative changes in the significance of control variables; in addition, the one-period lagged growth rate of H_0 positively influences the current growth rate of H_0 , suggesting the presence of persistence in poverty dynamics. Regarding our main results, regressions (7)-(9) show that a higher private credit to GDP ratio significantly decreases the growth rate of H_0 , confirming the robustness of our previous results based on FE-2SLS estimations (see columns 1-3). Analogously, regressions (10)-(12) illustrate that the negative effect of the bank deposit liabilities ratio on the growth rate of H_0 holds irrespective of the retained specification. On the whole, our findings emphasize

that CFA Franc Zone countries enjoying higher levels of financial development are more likely to experience faster reductions in their poverty headcount rate.

5.2 Poverty measured by the poverty gap index (H1)

The main criticism of the poverty headcount index (H0) is that it fails to account for improvements or deteriorations of the income of a poor person, provided this person stays below the poverty line. To tackle this shortcoming, we perform estimations based on the poverty gap index (H1), which measures the extent to which the income of individuals falls below the poverty line as a proportion of the poverty line.

Table 2 displays the effect of the private credit to GDP ratio on the growth rate of H1 using FE-2SLS (columns 1-3) and bias corrected LSDV (columns 7-9), and the effect of the bank deposit liabilities to GDP ratio on the growth rate of H1 using FE-2SLS (columns 4-6) and bias corrected LSDV (columns 10-12). Compared to results performed using the growth rate of H0 (see Table 1), the use of the growth rate of H1 does not lead to dramatic changes in the sign and significance of control variables, except for some significance loss for trade openness, and some significance gain for inflation who positively acts on the growth rate of H1. In particular, as this was the case for the growth rate of H0, the negative coefficient of initial H1 suggests a convergence process among poverty rates for the countries in our sample, while higher economic growth reduces poverty as measured by the growth rate of H1.

Let us now focus on the main results. According to regression (1) in Table 2, an increase in the private credit ratio significantly reduces the growth rate of H1. This result is robust not only to the presence of additional control variables (regressions (2) and (3)), but also when using alternative methods to control for a small sample bias in regressions (7)-(9), suggesting, yet again, that a Shaw intermediation effect might be at work. In addition, as emphasized by regressions (4)-(6) and (10)-(12), countries with higher bank deposit liabilities ratios present significantly lower poverty gap index growth rates. Consequently, irrespective of the measure of poverty, namely as the percentage of poor in the population (H0) or as the gap between the income of the poor population and the poverty line (H1), our results support the presence of a significant McKinnon conduit effect for the CFA Franc

Table 2: Financial development and changes in the poverty gap index (H1)

	FE-2SLS						Bias corrected LSDV dynamic panel					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent variable : Growth of H1												
Growth of H1 (-1)												
Initial H1	-0.016*** (0.004)	-0.019*** (0.003)	-0.061*** (0.014)	-0.014*** (0.003)	-0.016*** (0.002)	-0.063*** (0.011)	0.093*** (0.021)	0.084*** (0.016)	0.087*** (0.017)	0.097*** (0.023)	0.090*** (0.022)	0.089*** (0.012)
Private credit	-0.010** (0.004)	-0.035* (0.019)	-0.019*** (0.003)				-0.051** (0.017)	-0.046* (0.026)	-0.055** (0.023)	-0.040** (0.017)	-0.051* (0.027)	-0.054*** (0.025)
Bank deposit liabilities				-0.027** (0.012)	-0.066** (0.032)	-0.060* (0.033)	-0.059* (0.032)	-0.062** (0.030)	-0.012*** (0.002)			
GDP per capita growth	-0.205*** (0.034)	-0.260*** (0.040)	-0.161** (0.064)	-0.171*** (0.026)	-0.181*** (0.059)	-0.200*** (0.046)	-0.408*** (0.108)	-0.481*** (0.080)	-0.574*** (0.084)	-0.238*** (0.036)	-0.103*** (0.022)	-0.681*** (0.108)
Initial primary schooling		-0.022 (0.076)	-0.012 (0.082)		-0.001 (0.008)	-0.009 (0.085)		-0.078 (0.133)	-0.063 (0.128)		-0.070 (0.135)	-0.059 (0.131)
Trade openness		-0.006 (0.005)	-0.007 (0.005)		-0.002 (0.003)	-0.009 (0.006)		-0.001 (0.012)	-0.004 (0.012)		-0.002 (0.013)	-0.005 (0.012)
Inflation		0.011* (0.006)	0.026* (0.015)		0.025* (0.014)	0.029* (0.016)		0.035* (0.019)	0.016* (0.008)		0.010 (0.050)	0.023* (0.012)
Age dependency			0.020 (0.014)			0.019 (0.039)			0.018 (0.029)			0.013 (0.024)
Population growth			0.003 (0.002)			0.001 (0.006)			0.008 (0.057)			0.009 (0.056)
Constant	1.726*** (0.391)	-0.407*** (0.092)	-2.401*** (0.629)	-3.230* (1.740)	-0.549*** (0.123)	-1.833*** (0.342)						
Observations	91	83	83	91	83	83	91	83	83	91	83	83
Number of countries	13	13	13	13	13	13	13	13	13	13	13	13
Hansen OID p-value	0.538	0.124	0.444	0.142	0.347	0.668						

Robust standard errors (column 1-6) and bootstrapped standard errors (column 7-12) in parentheses; *significant at 10%; **significant at 5%; ***significant at 1%. Growth of H1 (-1) is the one three-year sub-period lagged value of the growth rate of H1. Instrumentation regressions for columns 3 and 6 are presented in the last two columns of Table 9 in the Supplementary Material. For the Bias corrected LSDV estimator, the bias correction is initialized by the standard Blundell-Bond System GMM estimator with no intercept.

Zone countries in our sample.

Finally, on the basis of columns 3 and 6, and 9 and 12 from Tables 1 and 2, the drop in poverty (i.e. in the growth rates of H0 or H1) is of higher magnitude in the virtue of McKinnon’s “conduit” effect (measured by the coefficient of bank deposit liabilities to GDP ratio), relative to Shaw’s “intermediation” effect (measured by the coefficient of private credit to GDP ratio).¹⁴ This result is explained by the analytical framework of McKinnon, which consists of an economy being in a state of “primitive finance” and where self-financed investments are important, with poor infrastructure and business communication, as this is the case for the CFA Franc Zone countries. Consequently, in light of our results, CFA Franc Zone countries could extensively benefit, in terms of poverty reduction, of policy aimed at promoting financial development through better access to financial saving services.¹⁵

6 Robustness

In this section, we check the robustness of our baseline results in two ways. First, we allow for nonlinearities in the basic specification (sub-section 6.1) and, second, we include a set of additional controls to further mitigate a potential omitted-variable bias (sub-section 6.2).

6.1 Financial development and poverty: possible nonlinearity

So far, we assumed the existence of a linear link between financial development and poverty. However, several studies, including [Deidda & Fattouh \(2002\)](#) or [Aghion *et al.* \(2005\)](#), emphasized the presence of nonlinearities between financial development and economic growth. Consequently, it might be appropriate to explore such possible nonlinearities in the specific relationship between financial development and poverty.

Following the financial development-growth literature, we assume nonlinearities to be governed by the level of financial development (see, for instance, [Aghion *et al.*, 2005](#)).¹⁶

¹⁴To some extent, our findings are supported by [Guillaumont & Kpodar \(2011\)](#), exhibiting an important McKinnon “conduit” effect in developing countries.

¹⁵ These results are broadly in line with and complement previous results for the WAEMU zone ([Kiendrebeogo, 2010](#)) and for the developing world ([Kiendrebeogo & Minea, 2013](#)).

¹⁶An alternative assumption is to consider that the effect of financial deepening varies with the level of

Table 3: Financial development and changes in poverty headcount (H0): nonlinearity

Dependent variable : Growth of H0	(1)	(2)	(3)	(4)	(5)	(6)
Initial H0	-0.059*** (0.011)	-0.060*** (0.014)	-0.063*** (0.012)	-0.056*** (0.014)	-0.108*** (0.032)	-0.094*** (0.030)
Bank deposit liabilities	0.072 (0.119)		-0.060* (0.032)		-0.072* (0.041)	
Bank deposit liabilities-squared	-0.026 (0.021)					
Private credit		0.225** (0.108)		-0.261* (0.141)		-0.102* (0.058)
Private credit-squared		-0.012* (0.006)				
Instability of Bank deposit liabilities			0.026** (0.012)			
Instability of Private credit				0.324* (0.176)		
Financial crisis					0.050** (0.023)	0.029** (0.016)
GDP per capita Growth	-0.911*** (0.170)	-0.799*** (0.182)	-1.720*** (0.618)	-0.852*** (0.189)	-0.602*** (0.136)	-0.613*** (0.157)
Initial primary schooling	-0.018 (0.088)	-0.023 (0.082)	0.009 (0.086)	0.039 (0.080)	-0.101 (0.203)	-0.098 (0.200)
Trade openness	-0.077* (0.042)	-0.029* (0.015)	-0.096* (0.052)	-0.076 (0.057)	-0.094 (0.102)	-0.095 (0.102)
Inflation	0.217 (0.160)	0.256 (0.153)	0.286 (0.178)	0.224 (0.172)	0.199 (0.179)	0.201 (0.196)
Age dependency	0.255* (0.135)	0.199 (0.142)	0.213 (0.147)	0.201 (0.134)	0.192 (0.205)	0.187 (0.195)
Population growth	0.026 (0.024)	0.041 (0.029)	0.034 (0.027)	0.030 (0.026)	0.084 (0.109)	0.093* (0.053)
Constant	-3.664* (1.845)	-2.321*** (0.491)	-1.281* (0.748)	-4.196*** (0.950)	-1.839*** (0.452)	-1.743*** (0.446)
Observations	83	83	83	83	83	83
Number of countries	13	13	13	13	13	13
Hansen OID (p-value)	0.219	0.196	0.207	0.182	0.119	0.121

Robust standard errors in parentheses; *significant at 10%; **significant at 5%; ***significant at 1%.

Consistent with the instrumentation procedure in Tables 1 and 2, the squared term of each measure of financial development is instrumented by the squared term of the instrumental variable. Since the indicator of financial instability is computed using a regression (see Table 12 in the Supplementary Material), its

Regressions (1) and (2) in Table 3 test for the presence of nonlinear effects in the relation between financial development and the growth rate of the poverty headcount index H0.¹⁷ Although our estimations refute the presence of nonlinear effects of bank deposit liabilities, they support such an effect of the private credit to GDP ratio on H0, since a higher credit ratio is reducing poverty only above a certain level. Intuitively, this result can be explained by the fact that, the more developed the financial system, the higher its ability to expand its services (loans, deposits, insurance) to the poor. In countries with underdeveloped financial systems, banks may not have effective procedures for evaluating credit applications, lack the expertise to monitor the performance of borrowers, or suffer from inadequate coverage of bank branches, which prevent the poor's access to the formal financial system. Therefore, it might be necessary that the financial system reaches a certain level of development before it can provide sustainable financial services to the poor.

Analogously, regressions (1) and (2) in Table 4 explore potential nonlinearities in the relation between financial development and poverty measured by changes in the poverty gap H1.¹⁸ Irrespective of the measure of financial development, its effect on the poverty gap does not seem subject to nonlinearities. In particular, compared to its nonlinear effect on H0, the absence of such effects of the private credit on H1 might suggest that enabling access to credit decreases income inequalities between the poor from the very early stages of financial development for the CFA Franc Zone countries in our sample.

An alternative test for the presence of nonlinearities in the effect of financial development is to consider the impact of financial instability on poverty.¹⁹ On the one hand, regressions (3) and (4) in Table 3 illustrate the influence of the instability of bank deposit liabilities

economic development, as in [Deidda & Fattouh \(2002\)](#) or [Jalilian & Kirkpatrick \(2005\)](#). However, this effect is not likely to emerge in our analysis, which focuses on CFA Franc Zone countries with reasonably close levels of economic development.

¹⁷Results are based on FE-2SLS estimations, and the squared term of financial development indicators is instrumented by the squared term of the instrumental variable.

¹⁸As for H0, results for H1 are based on FE-2SLS estimations, and the squared term of financial development indicators is instrumented by the squared term of the instrumental variable.

¹⁹Consistent with the related literature (see, for instance, [Akhter & Daly \(2009\)](#)), financial instability is captured by the deviation from the trend for each indicator of financial development (see Table 12 in the Supplementary Material). An alternative measure of financial instability is the standard deviation of the cyclical component of the financial development indicator (see, for instance, [Eggoh, 2008](#)); however, given its lack of time-variability, this measure is inappropriate for our panel analysis.

Table 4: Financial development and changes in poverty gap index (H1): nonlinearity

Dependent variable : Growth of H1	(1)	(2)	(3)	(4)	(5)	(6)
Initial H1	-0.244*	-0.094**	-0.310***	-0.701***	-0.166***	-0.179***
	(0.135)	(0.040)	(0.067)	(0.163)	(0.040)	(0.048)
Bank deposit liabilities	-1.084**		-0.109		-0.180**	
	(0.038)		(0.813)		(0.078)	
Bank deposit liabilities-squared	-0.022					
	(0.809)					
Private credit		-0.121***		-1.790**		-0.205*
		(0.010)		(0.745)		(0.120)
Private credit-squared		-1.722				
		(2.044)				
Instability of Bank deposit liabilities			1.472			
			(1.930)			
Instability of Private credit				-1.003		
				(0.855)		
Financial crisis					0.048**	0.017*
					(0.021)	(0.010)
GDP per capita Growth	-0.140**	-0.974***	-1.615*	-0.430	-0.279***	-0.303***
	(0.058)	(0.211)	(0.922)	(0.808)	(0.088)	(0.089)
Initial primary schooling	-0.092	-1.748	-0.010	-1.857	-0.218	-0.206
	(0.102)	(1.481)	(0.037)	(1.116)	(0.197)	(0.203)
Trade openness	-1.082	-0.265*	-0.141	-2.873	-0.398	-0.359
	(1.619)	(0.153)	(0.419)	(1.900)	(0.352)	(0.394)
Inflation	2.660**	2.847**	1.216	1.437*	1.004	1.002
	(0.150)	(0.064)	(0.124)	(0.802)	(1.104)	(1.101)
Age dependency	0.179	0.502	1.707	-0.878	0.181	0.160
	(0.513)	(0.438)	(1.679)	(1.377)	(0.206)	(0.188)
Population growth	0.093***	0.084***	0.819**	0.134*	0.158	0.171
	(0.014)	(0.004)	(0.348)	(0.074)	(0.205)	(0.221)
Constant	4.106***	5.552**	-1.563***	0.994**	-1.338***	-1.202***
	(1.052)	(2.177)	(0.411)	(0.422)	(0.461)	(0.387)
Observations	83	83	83	83	83	83
Number of countries	13	13	13	13	13	13
Hansen OID (p-value)	0.122	0.113	0.159	0.186	0.303	0.317

Robust standard errors in parentheses; *significant at 10%; **significant at 5%; ***significant at 1%. Consistent with the instrumentation procedure in Tables 1 and 2, the squared term of each measure of financial development is instrumented by the squared term of the instrumental variable. Since the indicator of financial instability is computed using a regression (see Table 12 in the Supplementary Material), its

and private credit to GDP on the poverty headcount index $H0$.²⁰ According to column 3, a higher instability of the bank deposit liabilities ratio increases the growth rate of $H0$. Thus, a more irregular access to savings services mitigates the positive effect bank deposit liabilities might have in reducing the growth rate of the share of the population leaving below the poverty line. Similarly, important variations in the amount of the credit offered by financial institutions are an obstruction in decreasing the expansion of $H0$ (see column 4). On the other hand, a higher instability of both bank deposit liabilities and private credit ratios does not significantly influence the growth rate of the poverty gap $H1$, as emphasized by regressions (3) and (4) in Table 4. This suggests that decreasing the volatility of the degree of financial development reduces the gap between the rich and the poor, while it has no significant on the inequalities between the poor population in the CFA Franc Zone countries in our sample.

Finally, as a robustness check, we consider financial crises instead of financial instability. The financial crisis dummy equals 1 if the country is in crisis in a given sub-period, and 0 otherwise. Financial crises include banking, currency, and sovereign debt crises, and data come from the datasets of [Laeven & Valencia \(2013\)](#) and [Reinhart & Rogoff \(2011\)](#). Results reported in regressions (5) and (6) in Tables 3 and 4 emphasize a statistically positive effect of financial crises on the growth rates of both $H0$ and $H1$,²¹ thus, unstable financial development leading to crises might mitigate the favourable effect of financial development on poverty reduction.

6.2 Financial development and poverty: additional controls

Although we account for country and time fixed effects in our baseline specifications, results reported in Tables 1 and 2 may be influenced by omitted time-varying factors. In this sub-section we deal with this issue by augmenting our baseline specification with the following additional regressors: remittances, financial openness (Kaopen) and its interaction with financial development, and institutional quality (Law and Order) and its interaction with financial development. Results are reported in Tables 5 and 6 for the growth of $H0$

²⁰Financial instability variables are instrumented using their one-period lagged value.

²¹Financial crises dummies are instrumented using their one-period lagged value.

and H1, respectively. The inclusion of additional controls has two sets of effects on baseline estimations. First, albeit most variables lose significance or magnitude, diagnostic tests still support our strategy (see the Hansen OID), and the coefficient of the initial value of the poverty measure is still significant and negative. Second, although the magnitude of the coefficients of financial development indicators is lower in absolute value, financial development is still found to significantly reduce poverty, irrespective of the way the main variables are measured. In particular, this magnitude loss (and even a significance loss in column 2 of Table 5) might be due to the presence in the new regressions of several new control variables whose effects is not statistically significant, such as interactive terms between financial development, financial openness and the quality of institutions, or remittances in most specifications, which may pollute results compared to our baseline estimations.

7 Conclusion

In this article we found that financial development reduces poverty in a sample of CFA Franc Zone countries. This result is valid when using alternative *(i)* measures of financial development, namely the ratio of private credit to GDP or the ratio of bank deposit liabilities to GDP, *(ii)* measures of poverty, namely the poverty headcount index or the poverty gap, *(iii)* control variables, and *(iv)* econometric techniques that control for the possible endogeneity of financial development or for a small sample bias. Consequently, both the McKinnon’s “conduit” and the Shaw’s “intermediation” effects are at work when it comes to reducing poverty through fostering financial development, although the former effect was found of higher magnitude. Nevertheless, the extent to which financial development reduces poverty through these channels may be subject to nonlinearities. Indeed, although better access to savings unambiguously decreases poverty, the development of the credit activity must reach a certain threshold before starting rolling back differences between rich and poor. In the same vein, higher financial instability or inappropriate financial expansion leading to financial crises might aggravate the differences between rich and poor.

By emphasizing direct effects of financial development on poverty reduction, our results outline the crucial role of financial reforms for fighting poverty in CFA Franc Zone countries.

Table 5: Financial development and changes in poverty headcount (H0): additional controls

Dependent variable : Growth of H0	(1)	(2)	(3)	(4)
Initial H0	-0.061*** (0.016)	-0.062*** (0.015)	-0.061*** (0.014)	-0.060*** (0.014)
Private credit	-0.021* (0.012)	-0.018 (0.029)		
(Private credit)×(Kaopen)	-0.026 (0.021)			
(Private credit)×(Law and Order)		-0.016 (0.095)		
Bank deposit liabilities			-0.074** (0.032)	-0.068* (0.039)
(Bank deposit liabilities)×(Kaopen)			-0.103 (0.129)	
(Bank deposit liabilities)×(Law and Order)				-0.089 (0.117)
GDP per capita Growth	-0.430*** (0.130)	-0.473*** (0.147)	-0.501*** (0.172)	-0.503*** (0.167)
Initial primary schooling	-0.035* (0.020)	-0.033 (0.059)	-0.029 (0.053)	-0.031 (0.058)
Trade openness	-0.063 (0.103)	-0.055 (0.097)	-0.060 (0.099)	-0.059 (0.084)
Inflation	0.130 (0.174)	0.138 (0.173)	0.162 (0.168)	0.158 (0.162)
Age dependency	0.168 (0.218)	0.169 (0.222)	0.184 (0.213)	0.188 (0.225)
Population growth	0.023 (0.055)	0.028 (0.054)	0.011 (0.048)	0.013 (0.044)
Remittances	-0.116* (0.067)	-0.137 (0.091)	-0.146* (0.085)	-0.142 (0.101)
Kaopen	0.121 (0.093)		0.105 (0.087)	
Law and Order		-0.064 (0.042)		0.059 (0.042)
Constant	-1.074*** (0.315)	-1.079*** (0.308)	-1.039*** (0.324)	-1.046*** (0.316)
Observations	83	83	83	83
Number of countries	13	13	13	13
Hansen OID (p-value)	0.281	0.198	0.204	0.201

Robust standard errors in parentheses; *significant at 10%; **significant at 5%; ***significant at 1%.

Table 6: Financial development and changes in poverty gap index (H1): additional controls

Dependent variable : Growth of H1	(1)	(2)	(3)	(4)
Initial H1	-0.026*** (7.64e-03)	-0.031*** (9.68e-03)	-0.022*** (6.66e-03)	-0.029*** (9.35e-03)
Private credit	-0.084** (0.036)	-0.049* (0.028)		
(Private credit)×(Kaopen)	-0.044 (0.116)			
(Private credit)×(Law and Order)		-0.016 (0.095)		
Bank deposit liabilities			-0.074** (0.032)	-0.068* (0.039)
(Bank deposit liabilities)×(Kaopen)			-0.103 (0.129)	
(Bank deposit liabilities)×(Law and Order)				-0.089 (0.117)
GDP per capita Growth	-0.194*** (0.066)	-0.202*** (0.021)	-0.191*** (0.057)	-0.198*** (0.067)
Initial primary schooling	-0.024* (0.013)	-0.022 (0.038)	-0.030 (0.061)	-0.039* (0.022)
Trade openness	-0.106 (0.117)	-0.097 (0.125)	-0.117 (0.121)	-0.104 (0.137)
Inflation	0.018 (0.067)	0.019 (0.068)	0.013 (0.029)	0.013 (0.031)
Age dependency	0.126 (0.137)	0.129 (0.132)	0.133 (0.152)	0.139 (0.155)
Population growth	0.010 (0.028)	0.011 (0.022)	9.18e-03 (0.017)	7.62e-03 (0.019)
Remittances	-0.029 (0.055)	-0.028 (0.055)	-0.019 (0.028)	-0.019 (0.028)
Kaopen	0.062 (0.101)		0.015 (0.066)	
Law and Order		-0.103 (0.136)		0.101 (0.131)
Constant	-1.918** (0.797)	-1.983*** (0.472)	-1.786*** (0.609)	-1.827*** (0.570)
Observations	83	83	83	83
Number of countries	13	13	13	13
Hansen OID (p-value)	0.134	0.116	0.185	0.176

Robust standard errors in parentheses; *significant at 10%; **significant at 5%; ***significant at 1%.

These financial reforms should be pro-poor through improved access of the poor to financial services (deposits, loans, insurance, etc.). In particular, policy-makers should support the creation and development of decentralized financial institutions, intended to provide access to deposit accounts and to loans for the poor. Examples include financial services to people who cannot access banking services or lack collateral, through the creation of guarantees funds that could be financed by public institutions and multilateral donors, under the surveillance of monetary authorities in order to prevent excessive financial instability.

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A Supplementary Material: *Exclusively For Online Publication*

<p>Appendix 1. List of countries: Benin, Burkina Faso, Cameroon, Central African Republic, Comoros, Congo, Ivory Coast, Gabon, Mali, Niger, Senegal, Chad, Togo.</p>

Table 7: Variables' definitions and sources

Variable	Variable's Definition	Source of (raw) variables
Poverty headcount index	Percentage of population living on \$1.25 a day or less	Povcalnet, World Bank
Poverty gap index	Average poverty gap in the population as a proportion of the poverty line, such that the non-poor have zero gaps	Povcalnet, World Bank
Private credit	Ratio of domestic credit to private sector to GDP	World Development Indicators, World Bank
Bank deposit liabilities	Ratio of bank deposit liabilities to GDP	International Financial Statistics, IMF
GDP per capita growth	The growth rate of the ration between GDP and population	World Development Indicators, World Bank
Initial primary schooling	School enrolment, primary (% gross)	World Development Indicators, World Bank
Inflation	Change in consumer prices (annual %)	World Development Indicators, World Bank
Trade openness	Ratio of imports plus exports to GDP	World Development Indicators, World Bank
Age dependency	Ratio of population below 15 years and above 65 years to population between 15 years and 65 years	World Development Indicators, World Bank
Population growth	Average annual growth rate of total population	World Development Indicators, World Bank
Instability of Private credit	Average absolute value of residuals obtained by regressing the private credit on its lagged value and a time trend	World Development Indicators, World Bank
Instability of Bank deposit liabilities	Average absolute value of residuals obtained by regressing the Deposit liabilities on its lagged value and a time trend	World Development Indicators, World Bank
Remittances	Personal remittances, received (% of GDP)	World Development Indicators, World Bank
Kaopen	Chinn-Ito, normalized	Chinn and Ito (2006)
Law and Order	ICRG Law and Order: assessment of the state of law and order. A maximum score of 6 points and a minimum score of 0 points. Higher values indicate a higher rating law and order	ICRG
Financial crisis	1 for the financial crisis inception year and 0 otherwise	Laeven & Valencia (2013) and Reinhart & Rogoff (2011)

Table 8: Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Minimum	Maximum
Poverty headcount index	130	68.37	38.30	23.00	90.76
Poverty gap index	130	46.44	22.91	1.17	86.94
Private credit	130	14.75	8.22	0.80	42.26
Bank deposit liabilities	117	12.81	6.76	1.39	36.09
GDP per capita growth	130	3.69	4.45	-16.47	13.99
Initial primary schooling	104	99.66	14.81	2.65	160.37
Inflation	130	23.40	81.60	-21.67	87.64
Trade openness	130	31.54	47.38	5.77	445.91
Age dependency	117	67.00	70.11	16.41	89.76
Population growth	130	1.68	11.73	0.72	11.82
Political Rights Index	117	4.34	2.21	1	7
Instability of Private credit	117	3.74	6.82	1.66e-03	138.64
Instability of Bank deposit liabilities	104	3.00	3.96	1.17e-03	41.76
Remittances	130	2.64	3.39	4.34e-04	19.29
Kaopen	130	0.21	0.10	0	0.41
Law and Order	96	2.55	0.73	1	4
Financial crisis	130	0.114	0.207	0	1

Table 9: Financial development and changes in poverty: Instrumentation regressions

	PC	BDL	PC	BDL
Political rights	0.242*** (0.078)	0.252*** (0.065)	0.179*** (0.048)	0.166*** (0.040)
Initial H0	0.116 (0.446)	0.200 (0.495)		
Initial H1			0.453 (1.168)	0.327 (0.316)
GDP per capita Growth	1.404** (0.610)	1.622* (0.891)	0.767*** (0.264)	0.724*** (0.219)
Initial primary schooling	0.692 (0.576)	0.249 (0.730)	0.430 (0.328)	0.523* (0.307)
Trade openness	1.179*** (0.380)	1.684* (0.881)	0.669*** (0.196)	0.602** (0.261)
Inflation	0.546 (1.193)	0.968 (1.216)	0.218 (0.577)	0.830 (0.744)
Age dependency	0.231 (1.132)	0.566 (1.247)	0.340 (0.573)	0.730 (0.633)
Population growth	0.701 (0.898)	0.749 (0.908)	0.016 (0.581)	0.144 (0.692)
Constant	1.508*** (0.396)	1.133** (0.565)	1.569*** (0.424)	1.241*** (0.376)
Observations	83	83	83	83
Number of countries	13	13	13	13
F-test (p-value)	0.000	0.000	0.000	0.000
Centred R2	0.413	0.411	0.523	0.520

Robust standard errors in parentheses; *significant at 10%; **significant at 5%; ***significant at 1%. PC and BDL stand for Private credit and Bank deposit liabilities, respectively.

Table 10: First-generation panel unit root tests: [Maddala & Wu \(1999\)](#) unit root test

Lags	Variables in levels: ADF equation includes intercept							
	gH0		gH1		PC		BDL	
	Khi-2	p-val	Khi-2	p-val	Khi-2	p-val	Khi-2	p-val
1	1016.041	0.000	1193.004	0.000	1301.904	0.000	1200.895	0.000
2	1031.063	0.000	1039.194	0.000	1270.030	0.000	1201.820	0.000
3	999.872	0.000	1002.209	0.000	1009.083	0.000	1006.833	0.000
Lags	Variables in levels: ADF equation includes intercept and trend							
	gH0		gH1		PC		BDL	
	Khi-2	p-val	Khi-2	p-val	Khi-2	p-val	Khi-2	p-val
1	1073.028	0.000	1172.091	0.000	1206.109	0.000	1203.118	0.000
2	1041.190	0.000	1094.015	0.000	1124.627	0.000	1001.990	0.000
3	1091.073	0.000	1086.018	0.000	1157.735	0.000	992.248	0.000

Note: gH0, gH1, PC and BDL denote Growth of H0, Growth of H1, Private credit and Bank deposit liabilities, respectively. The null is nonstationarity and the alternative is stationarity.

Table 11: Second-generation panel unit root tests: [Pesaran \(2007\)](#) unit root test

Lags	Variables in levels: CADF equation includes intercept							
	gH0		gH1		PC		BDL	
	Ztbar	p-val	Ztbar	p-val	Ztbar	p-val	Ztbar	p-val
1	-8.691	0.000	-10.348	0.000	-12.062	0.000	-11.941	0.000
2	-5.788	0.000	-8.815	0.000	-9.379	0.000	-10.639	0.000
3	-4.693	0.000	-6.604	0.000	-7.028	0.000	-7.117	0.000
Lags	Variables in levels: CADF equation includes intercept and trend							
	gH0		gH1		PC		BDL	
	Ztbar	p-val	Ztbar	p-val	Ztbar	p-val	Ztbar	p-val
1	-8.202	0.000	-10.127	0.000	-13.903	0.000	-11.604	0.000
2	-6.195	0.000	-9.300	0.000	-10.052	0.000	-10.941	0.000
3	-5.944	0.000	-8.819	0.000	-8.180	0.000	-8.005	0.000

Note: gH0, gH1, PC and BDL denote Growth of H0, Growth of H1, Private credit and Bank deposit liabilities, respectively. The null is nonstationarity and the alternative is stationarity.

Table 12: Regressions to generate the financial instability indicator

	Private credit	Bank deposit liabilities
Private credit (lagged)	0.239*** (0.058)	
Bank deposit liabilities (lagged)		0.171*** (0.045)
Trend	1.013*** (0.259)	0.147*** (0.039)
Constant	1.433*** (0.358)	1.584*** (0.510)
Observations	83	83
Number of countries	13	13
R-squared	0.519	0.528

Robust standard errors in parentheses; *significant at 10%; **significant at 5%; ***significant at 1%.

Figure 1: Bank deposits to GDP (%)

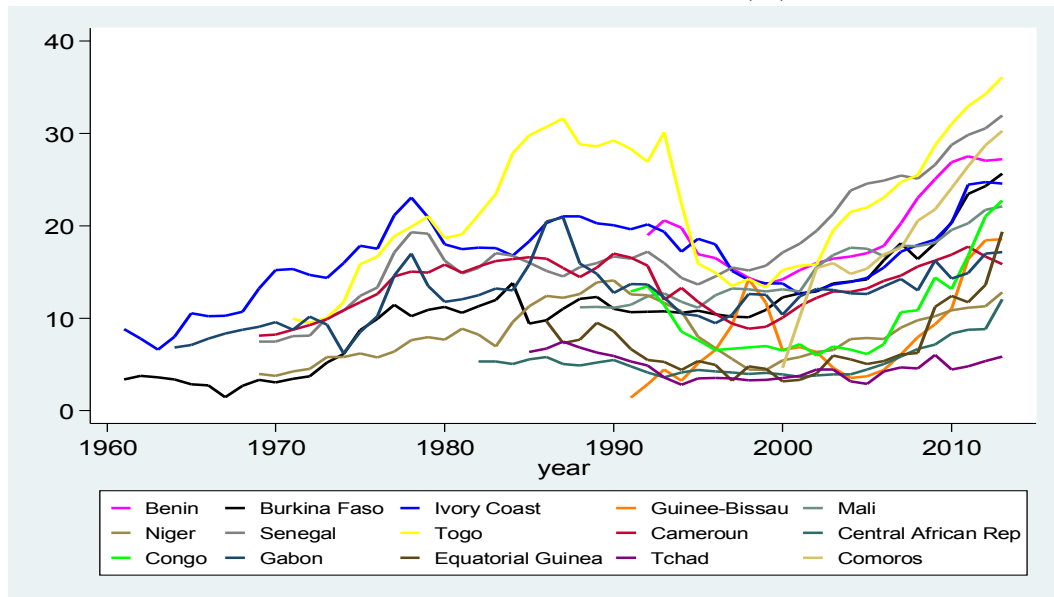


Figure 2: Domestic credit to private sector (% of GDP)

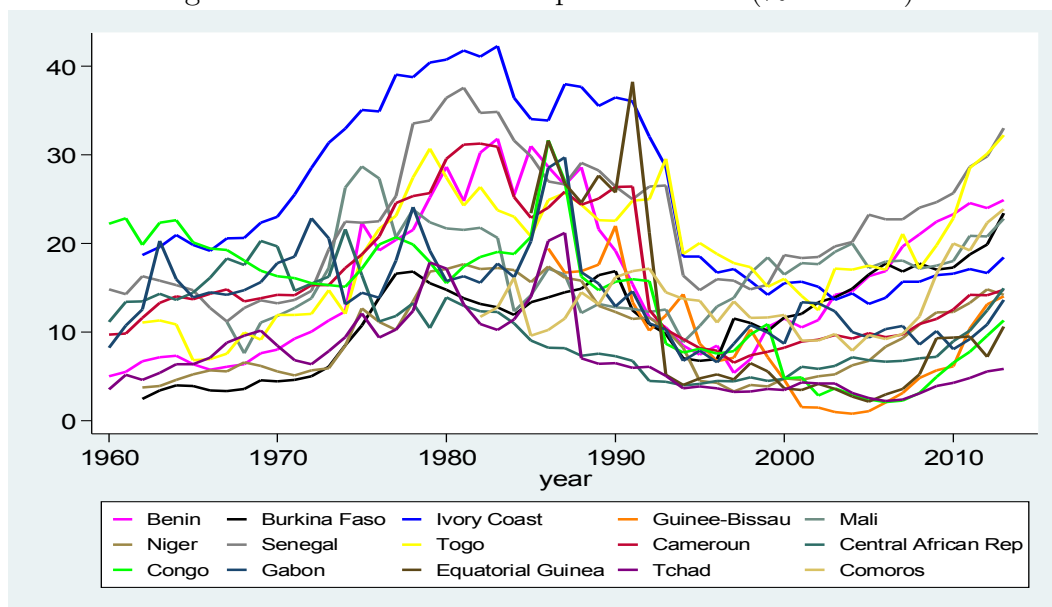


Figure 3: Domestic credit to private sector (% of GDP)

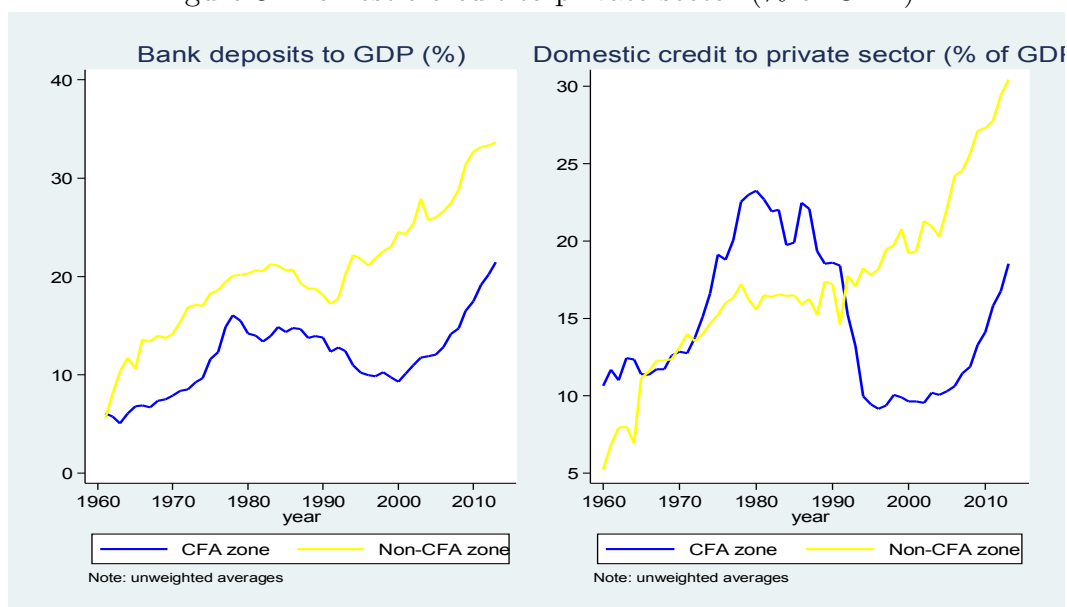


Figure 4: Financial development in SSA, Oil versus Non-oil economies

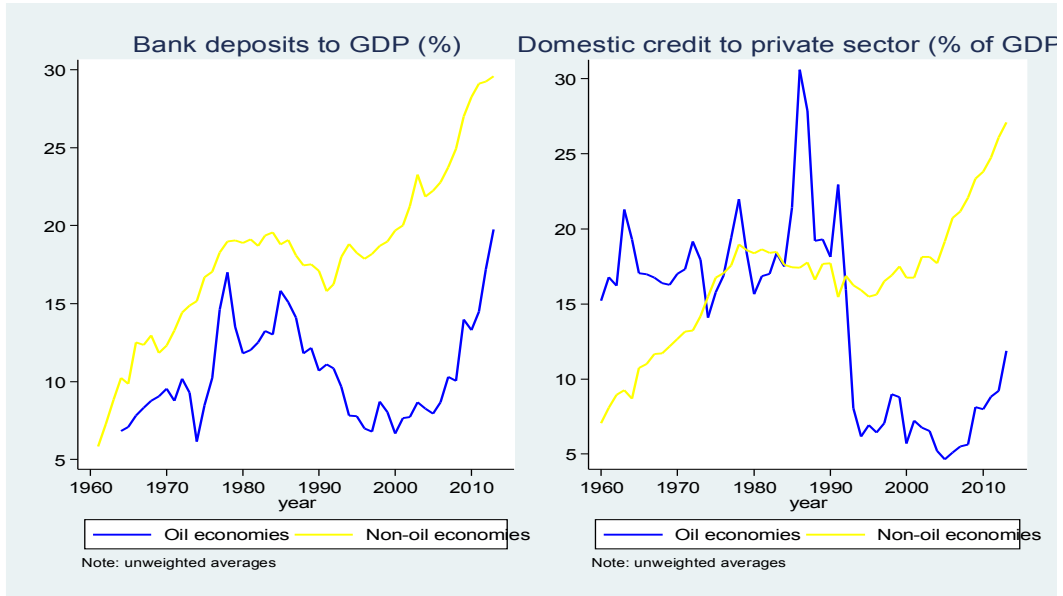


Figure 5: Financial development in WAEMU, ECCAS, and the Comoros

