Financial liberalization and its implications for private savings in sub-Saharan Africa

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Abstract: This paper employs data from 103 developing countries between 1981 and 2012 to examine the determinants of private savings in sub-Saharan Africa (SSA), with a focus on the effect of financial liberalization on private savings. It also analyses why the savings rate for SSA countries is lower than for other developing countries, by examining whether the determinants of private savings in SSA differ significantly from non-SSA countries. We find: (i) financial liberalization does not have a significant effect on private savings in all countries; (ii) the private savings rate for SSA countries is similar to non-SSA countries, after controls for relevant determinants of private savings; (iii) private savings are persistent, but the degree of persistence is lower for SSA countries; (iv) public savings crowd out private savings, but the crowding-out is more severe in SSA countries; (v) the growth rate of income per capita has a significant and positive effect on personal savings in both country groups; (vi) the effect of financial liberalization on private savings is similar for SSA countries in a monetary union and SSA countries outside a monetary union.

Key words: developing countries, financial liberalization, monetary unions, private savings, sub-Saharan Africa

JEL classification: O16, O19, O23, O55

Figures and tables: at the end of the paper

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1   Introduction

The private savings rate for sub-Saharan Africa (SSA) is much lower than the rate for developing countries outside SSA. For example, the average of the ratio of private savings to gross personal disposable income (GPDI) between 1981 and 2012 is about 13 per cent for SSA (Grigoli et al. 2018).[1] This compares with a savings rate of about 20 per cent for developing countries outside SSA. An important question that arises is: what accounts for the difference in savings rates between SSA countries and non-SSA developing countries? Answering this question is important because if the determinants of savings in SSA differ significantly from the determinants of savings in non-SSA developing countries, then policies that have been successful in other regions may not be (equally) successful in SSA. This paper focuses on one specific policy: domestic financial reform. Between the late 1980s and the early 2000s, many developing countries, including countries in SSA, liberalized their financial sectors. A relevant question is whether financial liberalization was successful in boosting savings in developing (SSA and non-SSA) countries, and whether the effect of financial liberalization on private savings is similar for SSA and non-SSA developing countries. In this paper we also determine whether, other things being equal, there are variations in the levels of private savings rates and differences in the effects of financial liberalization on private savings for SSA countries in a monetary union versus SSA countries outside a monetary union.

With regard to the literature, we note that several papers have examined the effect of financial liberalization on private savings. Schmidt-Hebbel and Servén (2002) conduct an extensive review of the literature on financial liberalization and private savings. They conclude: 'If a general consensus could be derived from the existing literature, it would be summarized as follows: while financial development appears to be a relevant determinant of growth, its effect on saving is unclear, although some evidence suggests that it is negative' (Schmidt-Hebbel and Servén 2002: 13). We note that the papers surveyed by Schmidt-Hebbel and Servén (2002) do not include papers that focus on SSA. We reviewed the literature on the determinants of private savings in SSA and came to a similar conclusion—that the effect of liberalization on private savings is inconclusive.[2] Furthermore, we found only four papers that employed panel data. Seck and El Nil (1993) use data from 21 African countries between 1974 and 1989; Kelly and Mavrotas (2008) utilize data from 1960 to 1997 for 17 African countries; Elbadawi and Mwega (2000) employ data for 15 countries in SSA between 1970 and 1995; the analysis by Mwega (1997) is based on data for 15 countries in SSA between 1970 and 1995.[3] There are two notable points: all these papers used data from before 2001, and the sample sizes are small, with most SSA countries being excluded from the analyses. Another important point is that several studies have found that private savings are persistent (Loayza et al. 2000; Schmidt-Hebbel and Servén 2002), suggesting that current levels of private savings are correlated with past private savings. This suggests that lagged private savings should be included as an explanatory variable in estimations. However, none of the papers we reviewed include lagged private savings as an explanatory variable in their regressions. There is also the issue of simultaneity and reverse causality between the explanatory variables and private savings. For example, causality may run from gross domestic product (GDP) per capita growth to

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[1] Some researchers have argued that due to several factors, including macroeconomic instability, households in SSA countries prefer informal financial savings, or hold non-financial assets instead of formal financial assets (Aryeetey and Nissanke 2005; Aryeetey and Udry 2000).

[2] See Fowowe (2013) for an extensive review of the literature on the effect of financial liberalization on savings, investment, and economic growth in SSA.

[3] Mwega (1997) employs data from 33 developing countries: 15 SSA and 18 non-SSA. The author runs regressions for the full sample as well as the split sample.

private savings, resulting in endogeneity. However, none of the papers address this potential source of endogeneity. Finally, none of the papers examine whether the effect of liberalization on private savings in SSA differs significantly for countries that are not members of a monetary union.

This paper contributes to the literature by answering the following questions. (i) What are the determinants of private savings in developing countries? (ii) Are the determinants of private savings similar for SSA countries and for developing countries outside SSA? (iii) Is the effect of financial liberalization on savings similar for SSA and non-SSA developing countries? (iv) What accounts for the variation in private savings rates among countries in SSA? (v) Does financial liberalization have a significant impact on private savings in SSA? (vi) Is the effect of financial liberalization on private savings different for SSA countries that belong to a monetary union?

To answer these questions, we draw on the most comprehensive, current, and readily available data on private savings, constructed by Grigoli et al. (2018).[4] Our paper makes at least three important contributions to the literature. First, our data set is large and recent. Specifically, our data covers 103 developing countries (42 SSA and 61 non-SSA) over the period from 1981 to 2012. Second, we use the system generalized method of moments (GMM) proposed by Blundell and Bond (1998) for our estimations, and we thereby address the endogeneity and dynamic issues not addressed in previous studies. Finally, to the best of our knowledge, this is the first study to examine whether the determinants of private savings in SSA are different from those in other regions. The exceptionality of SSA has been examined in many studies. For example, Asiedu (2002) finds that the factors that drive foreign direct investment to SSA countries are different from those for other developing countries. Easterly and Levine (1997) argue that the difference in growth performance between SSA and non-SSA developing countries can be explained by Africa's high ethnic fragmentation, which makes the continent structurally different, and Dalgaard et al. (2004) find that foreign aid is less effective in SSA. Rodrik (1998), on the other hand, finds that the effect of trade policy on trade is comparable for SSA and non-SSA countries, after controlling for important determinants of trade. Indeed, examining the 'Africa effect' on private savings is one of the innovations of our paper. In this sense, our work is similar to that of Edwards (1996), who investigates whether the determinants of the private savings rate for Latin American countries are significantly different from those for other countries.[5]

Our work is similar to that of Grigoli et al. (2018) in that we employ a similar specification and the same data set. However, our analysis differs in many respects. First, we focus solely on developing countries, while Grigoli et al. (2018) combine data from developed and developing countries.[6] Second, Grigoli et al. (2018) do not examine the exceptionality of SSA. Indeed, there is no mention of SSA in their paper. Third, we run separate regressions for countries in SSA and examine the relevance of monetary unions as a determinant of private savings. Fourth, as is standard in the literature, Grigoli et al. (2018) employ credit controls and real deposit rates as measures of financial liberalization. We use the same measures; however, as a robustness check, we employ the year of liberalization for the estimations for the SSA sample.

Our main results are as follows. (i) Financial liberalization has no significant effect on private savings in both country groups (SSA and non-SSA). (ii) The private savings rate for SSA is similar

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[4] See Grigoli et al. (2018) and Loayza et al. (2000) for a detailed description of the data.

[5] Edwards (1996) employs data from 36 countries between 1970 and 1992, including ten developed countries. Thus, important differences are that our analysis focuses only on developing countries and our sample size is bigger. In addition, we take into consideration the persistence of private savings by including lag private savings as an explanatory variable in our regressions.

[6] Grigoli et al. (2018) employ data from 153 countries (103 developing and 50 developed countries).

to the rate for non-SSA developing countries, after controls for relevant determinants of private savings. (iii) Private savings are persistent; however, the degree of persistence is lower in SSA countries. (iv) Public savings crowd out private savings; however, the crowding-out is more severe in SSA countries. (v) The growth rate of income per capita has a significant and positive effect on personal savings in both country groups. (vi) The effect of financial liberalization on private savings is similar for SSA countries in a monetary union and SSA countries outside a monetary union.

The remainder of the paper is organized as follows. Section 2 describes the liberalization policies employed by SSA countries and compares them with non-SSA countries. Section 3 provides information about trends in private savings in the countries in the sample, and compares these with non-SSA countries. Section 4 presents the empirical analysis, and Section 5 concludes.

2   Financial liberalization

We start with an overview of the financial liberalization process in SSA and then provide a detailed analysis of financial reforms in selected SSA countries. Finally, we compare financial reforms in the following regions: emerging Asia, SSA, Latin America and the Caribbean (LAC), and the Middle East and North Africa (MENA).

2.1   An overview of financial liberalization in SSA

Prior to the early 1990s, the financial system in most African countries was extremely repressive. Most economies in the region were characterized by restrictions on interest rates, credit rationing, lack of bank supervision, and high reserve requirements. In addition, several countries set up their own banks and used them as a means to provide credit to their preferred industries, finance their budget deficits, and fund state-owned enterprises (Briffaut et al. 1998). Moreover, between the 1980s and the early 1990s, many countries in the region experienced high inflation and stagnant growth. The growth rate of real GDP per capita over the period 1981 to 1993 was about -2.6 per cent for SSA (World Bank 2022). This compares with growth rates of 9.8 per cent, 2.5 per cent, -0.58 per cent and -0.54 per cent for developing countries in East Asia and the Pacific (EAP), South Asia, LAC, and MENA, respectively. In order to turn their economies around, many countries in the SSA region joined the International Monetary Fund (IMF)/World Bank's Structural Adjustment Programme (SAP). One of the conditions for a country to participate in the SAP was that the country had to agree to restructure its economy, including reforming its financial sector.[7] Financial sector reforms included the privatization of banks, the removal of credit controls, and the deregulation of interest rates such that prevailing interest rates were market-determined.

Table 1 shows the years when 46 countries in the region initiated major financial reforms, and it also indicates whether the country in question was part of the SAP. Thirty-two of the 46 countries initiated reforms as part of the SAP, suggesting that for about 70 per cent of the countries in SSA, financial liberalization was 'forced' by the IMF/World Bank. One peculiarity of financial reform in SSA is that some of the countries are in a monetary union that shares a common currency and interest rate structure, and therefore the central bank associated with the monetary union makes

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[7] SAP policies included reducing government spending, increasing taxes, reducing the size of the public sector, and privatizing government-owned enterprises. See Archibong et al. (2021) and Stein and Nissanke (1999) for a detailed analysis of the SAP in SSA.

the decisions about monetary policy. This implies that financial reforms relating to credit controls, reserve requirements, and interest rate deregulation for countries in a monetary union are a shared or common experience.[8] There are two monetary unions that share a common currency: the West African Economic and Monetary Union (WAEMU) and the Central African Economic and Monetary Community Union (CAEMU). The Banque Centrale des États de l'Afrique de l'Ouest (BCEAO) is the central bank of the WAEMU, and the Banque des États de l'Afrique Centrale (BEAC) is the central bank of the CAEMU.[9] There is also Southern Africa's Common Monetary Area (CMA); however, the CMA is different in that member countries have their own central banks that oversee monetary policies. Table 1 shows a list of the countries in the three monetary zones. The WAEMU comprises eight countries, the CAEMU has six countries, and there are four countries in the CMA. It is interesting to note that all the WAEMU countries participated in the SAP. In addition, with the exception of Equatorial Guinea, all the countries in the CAEMU also participated in the SAP. By contrast, none of the CMA countries signed up for the SAP.

We conclude by noting that recent data suggests that interest rate controls (IRCs), often considered a primary tool and measure of financial repression, seem to remain an issue for some SSA countries, particularly countries in the WAEMU. A recent study by Calice et al. (2020) reports *de jure* IRCs—administered caps or floors on interest rates in lending and deposit markets via explicit regulations. The report is based on a survey of 108 countries, including 17 SSA countries. Table 2 lists and shows the interest rate liberalization status of the 17 SSA countries included in the survey as at 2019. Only six countries (Ghana, Kenya, Mauritius, Seychelles, Sudan, and Zambia) reported fully liberalized interest rates. Note that all eight countries in the WAEMU are included on the list and that restrictions on both deposit and lending rates were imposed in 1992.[10] It is important to note that interest rate deregulation in the WAEMU countries was close to achieving full liberalization status in 1989. Specifically, in 1989 the only interest rates that were fixed by the BCEAO were the discount rate and a minimum rate on the passport savings deposit (Briffaut et al. 1998). This suggests that the policy reversal in 1992 was quite drastic. Interest rate restrictions for three non-WAEMU countries were imposed at later dates: for Ethiopia in 2017, for Mauritania in 2008, and for South Africa in 2005. In addition, with the exception of Ethiopia and South Africa, all the countries that imposed interest restrictions had restrictions on both lending and deposit rates. Ethiopia imposed restrictions on deposit rates and not on lending rates; South Africa was the opposite, as it imposed restrictions on lending rates and not deposit rates.[11]

2.2 Financial liberalization in selected countries in SSA

In this section, we employ data from Abiad et al. (2010) to provide a historical account of financial reform in 14 countries from 1973 to 2005.[12] These authors provide information on seven financial liberalization policies: IRCs, credit controls, entry barriers to the banking sector, bank privatization, banking sector supervision, capital account restrictions, and securities market policy. Each type of liberalization policy can take on four values: zero indicates full repression, one indicates partial repression, two indicates partial liberalization, and three indicates full liberalization. We do not

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[8] However, it is important to note that decisions about financial reform in some areas, such as the restructuring of banks, were made by specific countries and not by the central bank (Briffaut et al. 1998).

[9] The currencies of the WAEMU and CAEMU countries were pegged to the French franc until 1999 and have been pegged to the euro since then.

[10] See IMF (2021) for information on the recent monetary policies of WAEMU member countries.

[11] See Calice et al. (2020) for a detailed discussion of the process and rationale behind the implementation of interest rate restrictions.

[12] To the best of our knowledge, this is the most recent, comprehensive, and readily available data on financial liberalization in various countries.

include capital account restrictions and securities market policy in our discussion because the scores are very low and show very little variation across countries or over time. Thus, we focus on the other five liberalization policies. We derive an aggregate financial liberalization index (FLI), which is the sum of the five indices; therefore, the aggregate FLI ranges from zero to 15. Note that the aggregate FLI may be interpreted as a measure of overall financial liberalization. We make two modifications to facilitate the discussion. First, for the aggregate FLI, we define a score from zero to three as fully repressed, from four to nine as partially repressed, from ten to 14 as partially liberalized, and a score of 15 as fully liberalized. Second, we break the years down into eight periods: 1973–74 (period 1), 1975–79 (period 2), 1980–84 (period 3), 1985–89 (period 4), 1990–94 (period 5), 1995–99 (period 6), 2000–04 (period 7), and 2005 (period 8). For each period, we report the average of the aggregate FLI. In addition, we report the average FLI for each of the five subindices for the SSA country group.

Figure 1 shows the graph of the aggregate FLI for the SSA countries between 1973 and 2005, and the first row of Table 3 reports the average of the aggregate FLI for the eight periods. There are a few notable points. Figure 1 shows that SSA was fully repressed prior to 1988 and the aggregate FLI increased significantly after 1990. Specifically, from period 4 to period 6, the aggregate FLI increased from 3.20 to 9.36, an increase of about 193 per cent (Table 3, row 1). It is important to note that all the countries in the sample except South Africa were part of the SAP. Thus, the data supports the assertion that in many countries, financial reform was induced by the SAP. We now provide detailed information about the specific types of financial reform policies implemented by the group of SSA countries.

Figure 2 shows the graph of the FLI for each of the five policies, and rows 2 to 6 of Table 3 report the average of each type of liberalization policy for the eight periods. Figure 2 shows that SSA made progress in all areas except banking sector supervision. Table 4 shows that in period 1, SSA was fully repressed in the areas of bank supervision (0.0), IRCs (0.07), credit control (0.68), and privatization (0.61), and partially repressed in entry barriers (1.14). However, by period 8, SSA was almost fully liberalized in all areas except banking sector supervision, where it was partially repressed (Figure 2 and Table 3). Another observation is that there is variation in the periods when liberalization began for the various policies. The liberalization status of entry barriers to the banking sector changed from fully repressed to partially repressed in period 3, that of credit and IRCs in period 5, bank privatization in period 6, and banking sector supervision in period 8. This suggests that the sequence of liberalization was as follows: entry barriers to the banking sector, credit and IRCs, bank privatization, and banking sector supervision.

The above discussion has focused on aggregate indices for all countries. This masks the variation in the types of financial reform policies enacted by the various countries. We address this issue by reporting the liberalization efforts of each of the 14 countries. Figure 3 shows the graph of the aggregate FLI for each of the 14 countries between 1973 and 2005, and Table 4 reports the average of the aggregate FLI for the eight periods. There are four notable points. First, there was wide cross-country variation in the liberalization status in the initial years; however, by 2005 the status had converged. Specifically, Table 4 shows that the aggregate FLI in period 1 ranged from zero (fully repressed) for Ghana, Madagascar, and the United Republic of Tanzania to a high of 5.75 (partially repressed) for Cote D'Ivoire. However, by period 8, 12 of the 14 countries had attained partially repressed status. The two exceptions were Ghana (with an FLI of 9) and Ethiopia (with an FLI of 5). The second notable point is that the speed of liberalization varied significantly by country. For example, Tanzania's liberalization status changed from fully repressed to partially repressed in just one period. Specifically, Tanzania's began liberalization in period 5. Prior to that, it was fully repressed (an FLI of zero). However, its liberalization status changed to partially repressed in period 6 (an FLI of 10.25). By contrast, Kenya began liberalization in period 2 and attained partially repressed status in period 7 (an FLI of 10.3). Third, the data suggests that overall,

the level of liberalization improved over time; however, four countries experienced policy reversals, and the duration of the reversal varied by country. For South Africa, the policy reversal lasted for only one period, from period 1 to period 2; it lasted for two periods for Nigeria, from period 1 to period 3; three periods for Senegal, from period 1 to period 4; and five periods for Ethiopia, from period 1 to period 5. Finally, we note that with the exception of Ethiopia, all countries made significant progress in financial reform during the 31-year period. Specifically, the liberalization status of Ethiopia changed from partially repressed in period 1 (an FLI of four) to fully repressed in periods 2 to 5 (an FLI of less than three), returning to partially repressed status in periods 7 and 8.

2.3   Regional comparison of financial liberalization

We now compare the liberalization efforts of SSA with those of developing countries in Asia, LAC, and MENA. Figure 4 shows the graph of the aggregate FLI for the four regions between 1973 and 2005, and Table 5 reports the average of the aggregate FLI for the eight periods. The data shows that all regions were fully repressed in the first period; however, SSA recorded the highest FLI at 2.5, MENA's was 2.25, emerging Asia's was 2.02, and LAC's was 1.56, suggesting that SSA was the least repressed region. We also note there was a significant increase in aggregate FLI in all regions between period 4 and period 5. Specifically, between period 4 and period 5, the FLI increased by about 36 per cent in emerging Asia, 114 per cent in LAC, 91 per cent in SSA, and 104 per cent in MENA. This suggests that there was sweeping reform in developing countries during that period. Finally, we note that all regions were partially repressed in period 8, an indication of convergence.

3   Private savings in developing countries

In this section, we use data from Grigoli et al. (2018) to describe the trends in private savings for 103 developing countries from 1981 to 2012 (see Table A1 in the appendix for the list of countries). Table 6 reports the annual averages of the ratio of private savings to GPDI for the full sample and the regional groups. It also reports the private savings rates for the top four high-savings countries in SSA: Angola, Botswana, Gabon, and Namibia.

The data shows that overall, the private savings rate for SSA is much lower than the rate for non-SSA developing countries, and the savings gap widens when the four top countries are excluded. For example, the average private savings rate for SSA for the period 1980 to 2012 is about 13 per cent, and it drops to about 11 per cent when the four countries are excluded. This compares with a savings rate of 20 per cent for countries outside SSA. The regional comparison shows that overall, the savings rate for SSA is lower than the rates for MENA, South Asia, EAP, and Europe and Central Asia; however, the SSA rate is comparable to that of LAC. Specifically, the average savings rate over the period 1981 to 2012 for South Asia is about 1.6 times that of SSA, while the rate for MENA and the rates for EAP and LAC are 1.3 times and 1.1 times the rate for SSA.

We now provide a sense of the trend in private savings in the SSA countries over the sample period. Table 7 presents the average savings rates for the 42 SSA countries in our sample. The data shows wide cross-country variation in private savings, with rates as low as -1.18 per cent for the Central African Republic, 0.62 per cent for Mozambique, and 2.18 per cent for Sierra Leone, up to highs of about 50.57 per cent and 42.9 per cent for Angola and Gabon respectively. An important observation is that three of the top four countries with high private savings rates are oil-exporting countries.

4   Empirical analysis

This section begins with a description of the empirical approach and model used to address the research questions. In addition, the section provides a discussion of the empirical results.

4.1   Empirical model

The discussion in section 2 showed that the financially repressive policies implemented by most developing countries included interest rate regulation and the imposition of credit controls. Hence, the measures of financial liberalization typically employed in the literature are real interest rates and a measure of private sector credit. Some studies also use a dummy variable that reflects the year a country initiated major financial reforms. Clearly, all three measures have significant limitations.[13] For example, financial liberalization can move the real interest rate both upwards and downwards.[14] Furthermore, movement in the real interest rate may happen due to other macroeconomic factors, and hence the marginal effect may not necessarily represent the effect of financial liberalization. The dummy variable—the financial reform indicator—neither reflects the intensity of reform nor captures situations of policy reversal. This is problematic because, as noted in section 2, the intensity of reform varies by country. Furthermore, countries in the WAEMU removed IRCs in 1989 but reimposed controls in 1992. Clearly, the liberalization measures described in section 2 are more appropriate for our empirical analysis; however, the data are available for only 14 African countries. Furthermore, data for the year of financial reform is available for only SSA countries (see Table 1).

Despite the limitations identified in the measures used in previous studies, the absence of appropriate variables to capture financial liberalization leads us to employ the same set of variables for our empirical analysis. Specifically, we use the real deposit rate, the flow of private sector credit to GPDI, and a financial liberalization dummy. The regressions for the full sample employ real deposit rates and credit flows as measures of liberalization, and the regressions for SSA employ all three measures. Using three different measures of liberalization serves as a robustness check and also increases the credibility of our results. We note that theoretically, the effect of the real interest rate on private savings is ambiguous. The real interest rate may increase personal savings through the substitution effect; however, it may decrease personal savings if the wealth and income effect dominates over the substitution effect (Fowowe 2013). Similarly, the theoretical effect of domestic borrowing constraints on private savings is unclear. Current credit constraints, if binding, may force households to save for future purchases, and therefore a relaxation of the constraints may lead to a decrease in precautionary savings.[15] The ambiguous theoretical effect of these variables on private savings is reflected in empirical studies. Specifically, Grigoli et al. (2018) conduct a literature review regarding the determinants of private savings and find that out of 13 papers that included real interest rates as explanatory variables, the estimated coefficient of the real interest rate was not significant in seven papers, was negative and significant in two papers, and was positive and significant in four papers. For domestic credit borrowing constraints, they reviewed nine papers and found that domestic credit borrowing constraints were positive and significant in four studies and negative and significant in five. Our empirical analysis utilizes unbalanced panel

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[13] See Abiad et al. (2010) for a description of the various measures of financial liberalization.

[14] Financial liberalization can impact on real interest rates positively or negatively, depending on the extent to which monetary discipline can be maintained throughout the period of liberalization to ensure price stability. On one hand, moderate inflation can lead to positive real interest rates; on the other hand, excessive inflation can lead to negative real interest rates.

[15] See Schmidt-Hebbel and Servén (2002) for a detailed discussion.

data for 103 developing countries from 1981 to 2012.[16] Following Grigoli et al. (2018), we employ the two-step system GMM estimator with a collapsed instrument matrix and perform the Windmeijer (2005) correction to estimate the model[17]:

$$y_{it} = \gamma y_{it-1} + \beta X_{it} + \delta Z_{it} + c_i + \tau_t + u_{it} \tag{1}$$

y_{it} is the ratio of private savings to GPDI, X_{it} includes the endogenous (and predetermined) covariates for country i at time t, Z_{it} includes the strictly exogenous variables premised, c_i and τ_t are country fixed effects and time fixed effects respectively, and u_{it} is the error term. The explanatory variables are as follows: real per capita GPDI (purchasing power parity (PPP)), real growth rate of per capita GPDI (PPP), real deposit rate, terms of trade, inflation, flow of private sector credit/GPDI, public saving/GPDI, old-age dependency ratio, and share of urban population. Furthermore, the log of real per capita GPDI (PPP), real growth rate of per capita GPDI (PPP), real deposit rate, terms of trade, inflation, and flow of private sector credit/GPDI are treated as endogenous, and the old-age dependency ratio and share of urban population are treated as exogenous.[18] To facilitate the discussion, we consider equation [1] as our benchmark model, where only the variables listed above are included as explanatory variables in the regressions.

We perform two separate analyses. We start by answering the first three questions posed in the introduction. (i) What are the determinants of private savings in developing countries? (ii) Are the determinants of private savings similar for SSA countries and for developing countries outside SSA? (iii) Is the effect of financial liberalization on savings similar for SSA and non-SSA developing countries? The second set of regressions focuses on SSA, and we answer the following questions: (iv) What accounts for the variation in private savings rates among countries in SSA? (v) Does financial liberalization have a significant impact on private savings in SSA? (vi) Is the effect of financial liberalization on private savings different for SSA countries that belong to a monetary union?

Table 8 shows the summary statistics of the variables included in the regressions. There are a few notable points. The private savings rate, real deposit rate, and private credit ratios are much lower in SSA. Specifically, the private savings rate for non-SSA countries is about 1.6 times the rate for SSA countries. The real interest rate for non-SSA countries is about 3.6 times the rate for SSA countries, and the private credit ratio for non-SSA countries is about double that of SSA countries. This suggests that overall, countries in SSA are more financially repressed than countries in other regions. An important question is whether the difference in private savings rates between SSA and other regions will hold after we control for other important determinants of private savings. Another relevant question is whether the relationship between private sector credit ratio and private savings, as well as other determinants of private savings, is similar for SSA and non-SSA countries.

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[16] See Table A1 in the appendix for the list of countries included in the regressions.

[17] We thank Grigoli et al. (2018) for sharing their data and do file.

[18] See Grigoli et al. (2018) and Loayza et al. (1998) for a detailed description of the data. See also Loayza et al. (2000) and Grigoli et al. (2018) for the rationale for including each of the explanatory variables and the expected signs of their savings effect based on consumption theory, as well as a discussion of the orthogonality conditions within the context of private saving and its determinants.

4.2 Empirical results

We start by estimating the benchmark model. The results reported in column 1 of Table 9 show that the estimated coefficients of the real deposit rate and private sector ratio are not significantly different from zero, suggesting that other things being equal, financial liberalization does not have a significant effect on private savings in the developing countries in our sample. Loayza et al. (2000) also find that the estimated coefficient of the real interest rate is not significant for their developing country sample; however, the estimated coefficient of the private credit ratio is significant, negative, and quite large at about 0.51.[19] The authors note that 'the relaxation of credit constraints leads to a decrease in the private saving rate' (Loayza et al. 2000: 174), and they add that 'the direct effects of financial liberalization are largely detrimental to private saving rates' (Loayza et al. 2000: 180). Edwards (1996: 21) also finds that the real interest rate does not have a significant effect on private savings and suggests that 'the financial liberalization hypothesis should be interpreted broadly going well beyond the effect of higher interest rates on savings'.

We now turn our attention to the other determinants of private savings. The estimated coefficient of the lagged private savings rate is positive and significant at the one per cent level, suggesting that private savings are persistent. A point estimate of 0.502 implies that other things being equal, the effect of a change in the other determinants of private savings in the long run is equal to about double the effect in the first year. The level and growth rate of per capita GPDI and the terms of trade have a positive and significant effect on private savings. Other things being equal, a one percentage point increase in the growth rate of real per capita GPDI will raise the private savings rate by about 0.21 percentage points, and a ten per cent improvement in the terms of trade increases the private savings rate by 0.49 percentage points in the short run. The estimated coefficient of public savings is negative and significant at the one per cent level; however, the point estimate is less than one, suggesting that other things being equal, public savings *partially* crowd out private savings. Thus, the result does not support the Ricardian equivalence hypothesis. Our finding is consistent with several studies, including Edwards (1996), Loayza et al. (2000), and Grigoli et al. (2018). An important implication of this result is that an increase in public savings raises national savings. The estimated coefficient of inflation is positive; however, it is significant only at the ten per cent level. With regard to the demographic variables, we find that the estimated coefficient of the old-age dependency ratio is negative and significant at the five per cent level. Other things being equal, a one percentage point increase in the old-age dependency ratio decreases the private savings ratio by about 1.3 percentage points. This result is consistent with the standard life cycle models of consumption. The estimated coefficient of the urbanization ratio is negative but significant only at the ten per cent level. To the extent that urbanization increases (precautionary) private savings, this result (coupled with that for inflation) suggests that the precautionary motive for private savings in developing countries is not very strong.

We next examine whether the difference in private savings rates across the regions reported in Table 8 holds after we control for relevant determinants of private savings. Here, we include a dummy variable that takes on the value of one for countries in SSA and zero otherwise. The results in column 2 show that the estimated coefficient of the SSA dummy variable is not significantly different from zero, suggesting that after controls for the relevant determinants of private savings, the private savings rate for SSA countries is comparable to that of non-SSA countries. This is

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[19] In Loayza et al. (2000), the estimated coefficient of the real interest rate is not significant for the developing country sample; however, it is negative and significant for the full sample. Furthermore, the estimated coefficient of the private credit ratio is significant and negative for both the full sample and the developing country sample. For their full sample, Grigoli et al. (2018) find that the estimated coefficient of the real interest rate is not significant; however, the private credit ratio is negative and significant.

interesting because, as pointed out earlier, the average private savings rate for SSA is much lower than the savings rate for the other regions when we do not control for the relevant determinants of private savings. Edwards (1996) arrives at a similar conclusion for countries in Latin America.

We next examine whether the determinants of private savings for SSA differ significantly from those for developing countries outside SSA. Here we interact the SSA dummy variable with all the explanatory variables. Note that our variables of interest are those for which the estimated coefficients of the interaction terms are significantly different from zero. The results reported in column 3 show that the estimated coefficients of all the interaction terms are not significantly different from zero, except the estimated coefficients of public savings and lagged private savings. The estimated coefficient of SSA public savings is negative and significant—other things being equal, a one percentage point increase in the public savings rate reduces the private savings rate by 0.39 percentage points more in SSA countries than in non-SSA developing countries. This implies that the crowding-out effect of public savings is more pronounced in SSA countries than in non-SSA countries. The estimated coefficient of the interaction term of the lagged private savings ratio and SSA is negative and significant, suggesting that private savings are less persistent in SSA (0.38) than in other regions (0.91). This implies that for countries outside SSA, the long-run effect of a permanent change in the other determinants of the private savings rate is about 11 times the respective effect in the short run. This compares with a long-run effect of only 1.6 times for SSA. This result has important implications because it suggests that in the long run, similar (permanent and positive) changes in the determinants of private savings provide more dividends to non-SSA countries than SSA countries.

The next analysis focuses exclusively on SSA countries. Specifically, we limit the analysis to 42 countries in SSA. Furthermore, unlike the previous set of regressions, our regressions do not include time fixed effects—including time fixed effects raises the number of instruments to 48, which exceeds the number of countries and therefore makes the results unreliable (Roodman 2009). The results in Table 10 employ the real deposit rate and private credit ratio as measures of liberalization. We report our robustness results in Table 11, where we use the reform dummy as a proxy for financial liberalization.

Column 1 of Table 10 presents the results for the benchmark model. The estimated coefficients of the real deposit rate and the credit ratio are not significantly different from zero, suggesting that other things being equal, financial liberalization does not have a significant impact on private savings in SSA. Similarly to the results for the full sample, the estimated coefficient of the lagged private savings and growth rate of real GPDI per capita is positive and significant, and the estimated coefficient of public savings is negative and significant. Other things being equal, a one percentage point increase in the growth rate of real per capita GPDI increases the private savings rate by about 0.14 percentage points in the short run and about 0.22 percentage points in the long run. Public savings partially crowd out private savings: other things being equal, the short-run (adverse) effect of a one percentage point increase in public savings is about 0.38 percentage points, and the long-run effect is about 0.61 percentage points. In column 2 we include two dummy variables to represent the WAEMU and CAEMU to test whether the private savings rate for countries in these monetary unions is different from that for countries outside them. The first dummy variable, WAEMU, takes on the value one for countries in the WAEMU and zero otherwise. The second dummy variable, CAEMU, takes on the value one for countries in the CAEMU and zero otherwise. The estimated coefficients of WAEMU and CAEMU are not significantly different from zero, suggesting that the savings rates for the countries in the sample are comparable after controls for relevant determinants of savings. Finally, we examine whether the effect of financial liberalization on private savings is different for SSA countries that belong to a monetary union. Here we interact the liberalization variables with the monetary union dummy variables. As shown in column 3, the estimated coefficients of all the interaction terms are not

significantly different from zero, suggesting that the effect of financial liberalization on private savings is comparable for all the countries in the sample.

We next report the robustness regression results, where we employ the financial liberalization dummy ('liberal') as our measure of liberalization. The results reported in Table 11 are qualitatively similar to the results in Table 10. Specifically, the estimated coefficients of liberal, liberal*WAEMU, and liberal*CAEMU are not significantly different from zero. This lends credence to our finding that financial liberalization does not have a significant impact on private savings and that this applies to countries both within and outside the Communauté Financière Africaine.

5   Conclusion

Relative to other developing regions, low savings rates characterize the SSA region. To boost domestic investment and facilitate higher growth in the SSA region, the domestic savings rate—a key determinant of economic growth—must increase. An important question is what accounts for the difference in savings rates between SSA countries and non-SSA developing countries. This paper has analysed the determinants of private savings in developing countries, focusing on the effect of financial liberalization on private savings. The paper has also analysed whether the determinants of private savings in SSA countries differ significantly from the determinants of private savings in non-SSA developing countries. Further, we have examined whether, other things being equal, there are variations in the levels of private savings rates and the effects of financial liberalization on private savings for countries in SSA that are part of a monetary union compared with their counterparts outside a monetary union. Our analysis has employed data from 103 (42 SSA and 61 non-SSA) developing countries between 1981 and 2012.

We conclude by making four policy recommendations that governments in SSA might implement to boost private savings. First, our study shows that the factors that drive private savings in the SSA region are similar to those in other developing regions. An important implication of this finding is that countries in the SSA region can learn from countries with high private savings, such as the four Asian tigers—Hong Kong, Singapore, South Korea, and Taiwan (Hamilton and Clemens 1999). However, we also find that due to the persistent nature of private savings, the long-run effect of a permanent change in the other determinants of the private savings rate is about 11 times its respective effect in the short run for countries outside SSA. This compares with a long-run effect of only 1.6 times for SSA. This result has important implications because it suggests that in the long run, similar (permanent and positive) changes in the determinants of private savings provide more dividends to non-SSA countries than to SSA countries. This means that SSA countries need to implement more aggressive policies than other developing countries in order to realize similar positive effects to non-SSA developing countries.

Second, we find that financial liberalization does not have a significant impact on private savings. Section 2 showed that many countries reformed their financial sectors, mostly as part of the SAP reform package. These reforms are still important, since several studies show that financial deepening is relevant for long-term growth (King and Levine 1993; Levine 2005; Rioja and Valev 2004). However, our study shows that several countries, particularly countries in the WAEMU, have reversed their policies and reimposed IRCs. This development is clearly concerning because the reimposition of IRCs may have a broader adverse effect, such as growth reduction, even if it does not reduce private savings.

Third, we find that the growth rate of per capita income has a positive and significant impact on private savings in both the short and long run. This suggests that implementing policies that raise long-term growth will boost private savings. Such policies would include promoting good institutions and investing in human capital, physical capital, and technology. More importantly, Rodrik et al. (2004) conclude that when it comes to the determinants of growth, the quality of institutions trumps everything else. It is important to note that overall, countries in SSA have weaker institutions—thanks to factors such as high levels of corruption, weak property rights, and a lack of enforcement of contracts—than non-SSA developing countries (Sobrinho and Thakoor 2019). Hence, improving institutional quality in the SSA region may facilitate higher growth and thereby promote private savings.

Finally, our results also show that other things being equal, a one percentage point increase in public savings reduces private savings by 0.38 percentage points in the short run, which translates into a 0.62 percentage point increase in national savings. This suggests that a decrease in government deficit will lead to an increase in national savings, which in turn will raise investment and thereby increase growth. We note that the fiscal deficit for SSA is higher than in other regions. For example, the average fiscal deficit as a share of GDP for SSA in 2021 was about 5.3 per cent. This compares with 4.5 per cent for LAC, and 3.2 per cent for the Middle East and Central Asia (IMF 2022). In policy terms, this suggests that it would be beneficial for SSA governments to reduce their high fiscal deficits. Our results show that the determinants of savings are similar for countries within and outside the monetary unions in SSA. Therefore, countries in the region may need to engage in the harmonization of their macroeconomic policies in order to promote higher private savings rates in the region. Similarly to the European Union's Maastricht convergence criteria, which bind member countries to a budget deficit less than or equal to three per cent of national GDP, the 15 members of the Economic Community of West African States have adopted rationalized convergence criteria in preparation for the launch of the community's single currency. Under these criteria, members are also required to reduce their budget deficit to less than three per cent of national GDP. Reducing fiscal deficits can potentially increase national savings, boost investment and growth, and create a virtuous circle.

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Figures and tables

Figure 1: Aggregate FLI for 14 SSA countries, 1973–2005
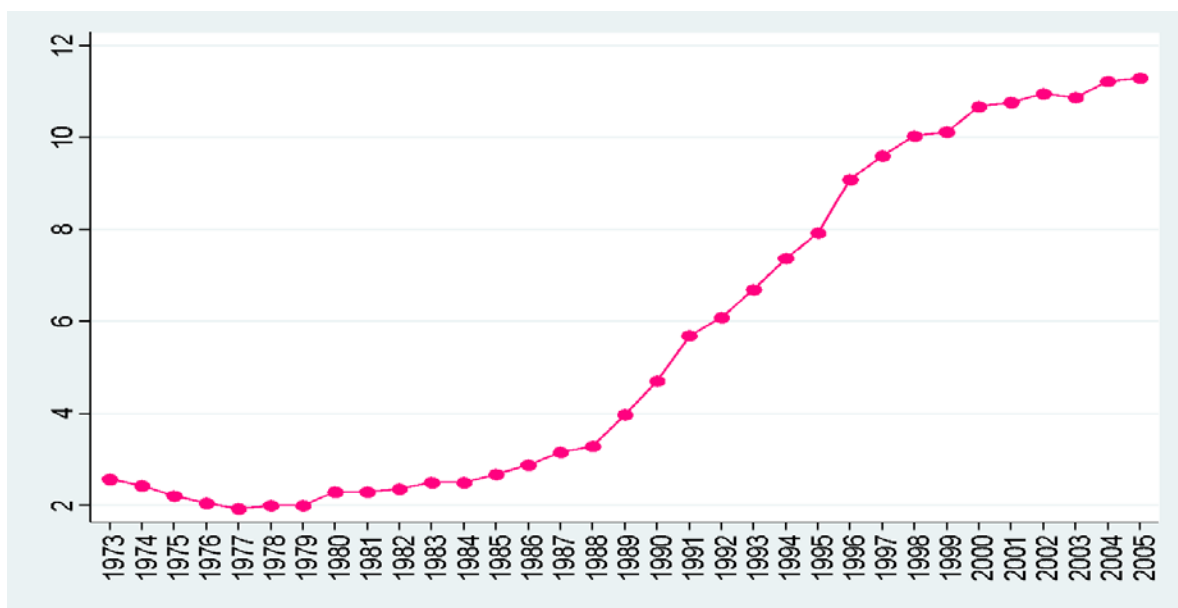
Note: aggregate FLI ranges from 0 to 15. A higher number implies more liberalization.

Source: authors' illustration based on data from Abiad et al. (2010).

Figure 2: Types of financial liberalization policies implemented by 14 SSA countries, 1973–2021
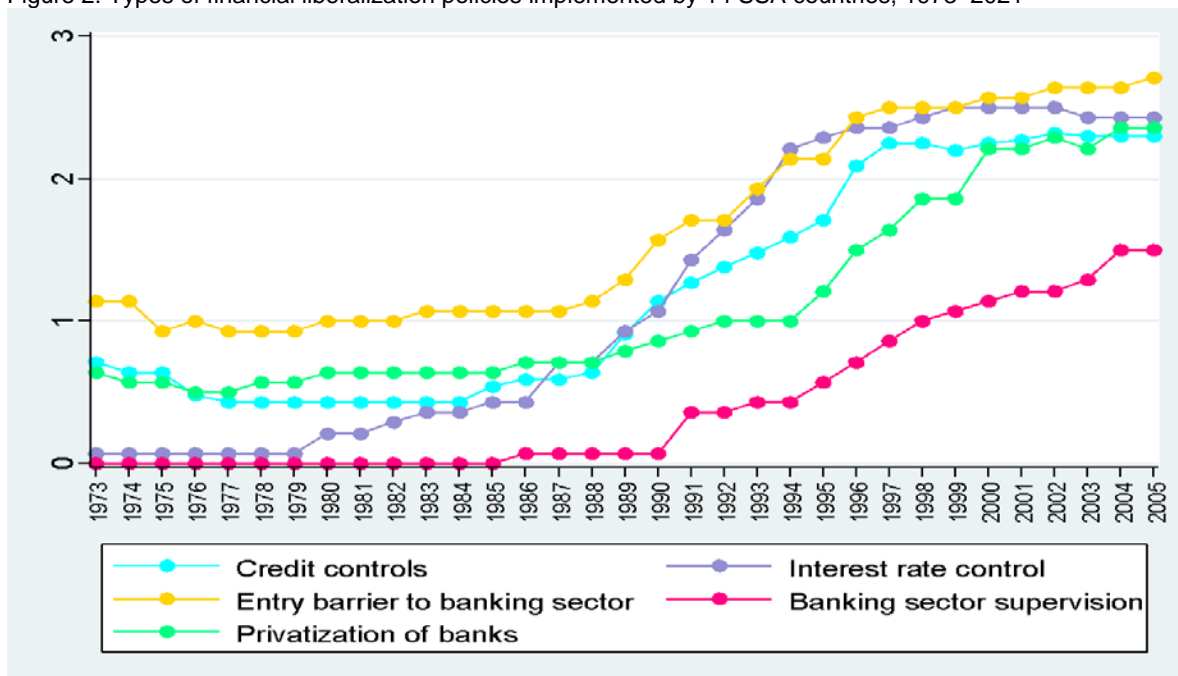
Note: data are available for 1973–2005. Each measure of liberalization ranges 0–3, where 0=fully repressed, 1=partially repressed, 2=partially liberalized, and 3=fully liberalized.

Source: authors' illustration based on data from Abiad et al. (2010).

Figure 3: Aggregate FLI for 14 SSA countries, 1973–2005
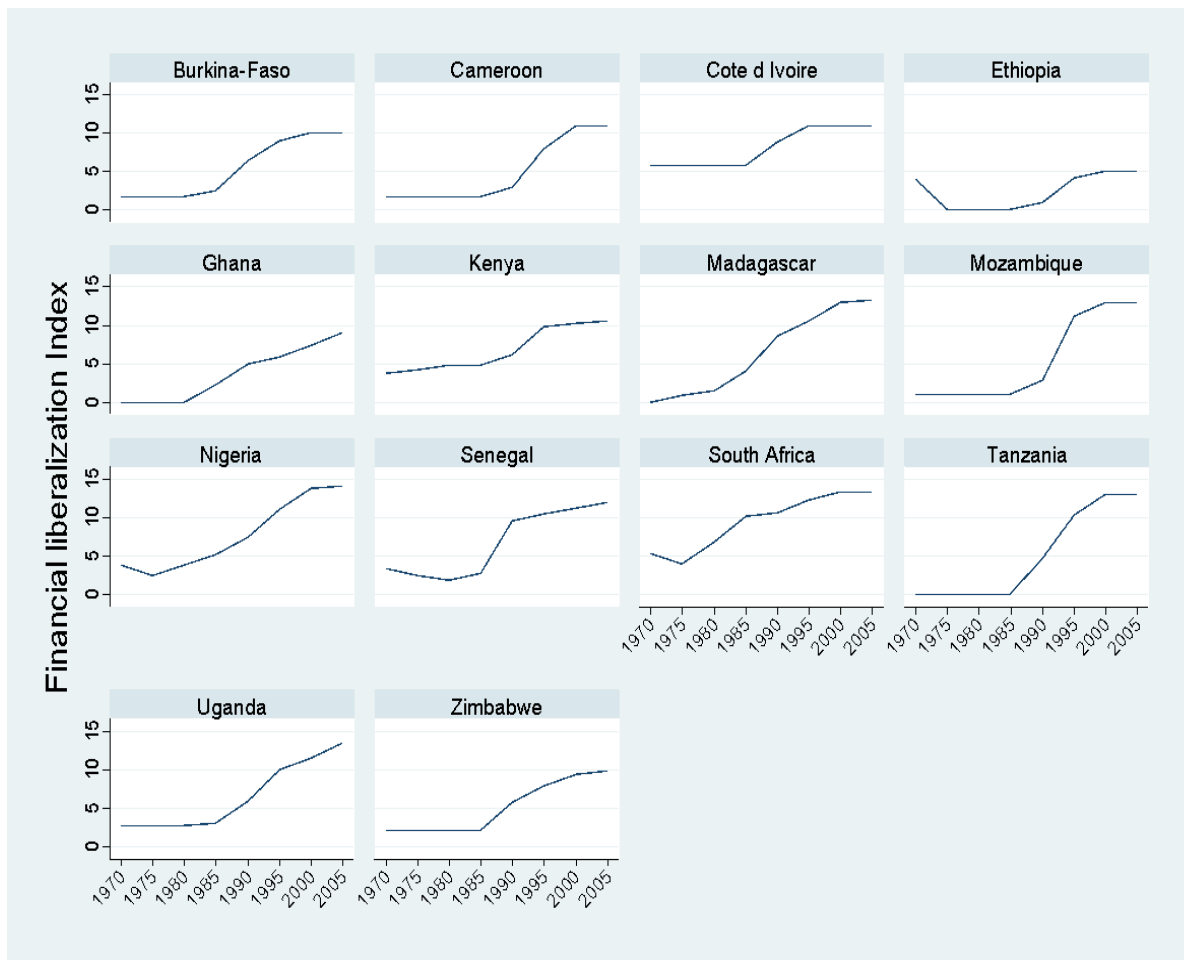
Note: aggregate FLI ranges from 0 to 15. A higher number implies more liberalization.

Source: authors' illustration based on data from Abiad et al. (2010).

Figure 4: Aggregate FLI by region, 1973–2005

Notes: aggregate FLI ranges from 0 to 15. A higher number implies more liberalization.

Source: authors' illustration based on data from Abiad et al. (2010).

Table 1: Overview of financial liberalization in 46 countries in SSA

Country	Start date of major liberalization	Monetary union status	IMF programme at start of liberalization
Angola	1990	No	No
Benin	1989	WAEMU	Yes
Botswana	1986	No	No
Burkina Faso	1989	WAEMU	Yes
Burundi	1986	No	Yes
Cameroon	1990	CAEMC	Yes
Cabo Verde	1990	No	No
Central African Republic	1990	CAEMC	Yes
Chad	1990	CAEMC	Yes
Comoros	1990	No	No
Democratic Republic of the Congo	1990	No	Yes
Congo	1990	CAEMC	Yes
Cote D'Ivoire	1989	WAEMU	Yes
Djibouti	1990	No	No
Equatorial Guinea	1990	CAEMC	No
Eswatini	1982	CMA	No

Ethiopia	1990	No	Yes
Gabon	1990	CAEMC	Yes
Republic of the Gambia	1985	No	Yes
Ghana	1987	No	Yes
Guinea Bissau	1989	WAEMU	Yes
Guinea	1989	No	Yes
Kenya	1985	No	Yes
Lesotho	1980	CMA	No
Liberia	1990	No	No
Madagascar	1985	No	Yes
Malawi	1988	No	Yes
Mali	1989	WAEMU	Yes
Mauritania	1990	No	Yes
Mauritius	1981	No	No
Mozambique	1994	No	Yes
Namibia	1991	CMA	No
Niger	1989	WAEMU	Yes
Nigeria	1985	No	Yes
Rwanda	1990	No	No
Sao Tome and Principe	1990	No	Yes
Senegal	1981	WAEMU	Yes
Seychelles	1990	No	No
Sierra Leone	1992	No	Yes
South Africa	1980	CMA	No
Sudan	1997	No	No
United Republic of Tanzania	1991	No	Yes
Togo	1989	WAEMU	Yes
Uganda	1992	No	Yes
Zambia	1991	No	Yes
Zimbabwe	1991	No	Yes

Source: authors' compilation based on data from Abiad et al. (2010), Fowowe (2008), Reinhart and Tokatlidis (2003), and IMF and World Bank country reports and working papers.

Table 2: IRCs as of 2019 in selected SSA countries

Country	IRC (2019)	Type of IRC		Year IRC was imposed
		Lending rate Cap	Deposit rate Floor	
Benin*	Yes	Yes	Yes	1992
Burkina Faso*	Yes	Yes	Yes	1992
Côte D'Ivoire*	Yes	Yes	Yes	1992
Ethiopia	Yes	No	Yes	2017
Guinea Bissau*	Yes	Yes	Yes	1992
Mali*	Yes	Yes	Yes	1992
Mauritania	Yes	Yes	Yes	2008
Niger*	Yes	Yes	Yes	1992
Senegal*	Yes	Yes	Yes	1992
South Africa	Yes	Yes	No	2005
Togo*	Yes	Yes	Yes	1992
Ghana	No	No	No	NA
Kenya	No	No	No	NA
Mauritius	No	No	No	NA
Seychelles	No	No	No	NA
Sudan	No	No	No	NA
Zambia	No	No	No	NA

Note: * countries are part of WAEMU.

Source: authors' compilation based on data from Calice et al. (2020).

Table 3: FLI for 14 SSA countries

Financial liberalization	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8
SSA (aggregate)	2.5	2.04	2.39	3.2	6.11	9.36	10.9	11.3
Credit control	0.68	0.48	0.43	0.65	1.37	2.1	2.29	2.3
IRCs	0.07	0.07	0.29	0.64	1.64	2.39	2.47	2.43
Privatization of banks	0.61	0.54	0.64	0.71	0.96	1.61	2.26	2.36
Entry barrier to banking sector	1.14	0.94	1.03	1.13	1.81	2.41	2.61	2.71
Bank sector supervision	0	0	0	0.06	0.33	0.84	1.27	1.5

Note: period 1=1973–74, period 2=1975–79, period 3=1980–84, period 4=1985–89, period 5=1990–94, period 6=1995–99, period 7=2000–04, period 8=2005. Data for SSA reported in first row are aggregate FLI and ranges from 0 to 15. FLI for each liberalization policy (reported in rows 3–5) ranges from 0 to 3, where 0=fully repressed, 1=partially repressed, 2=partially liberalized, and 3=fully liberalized.

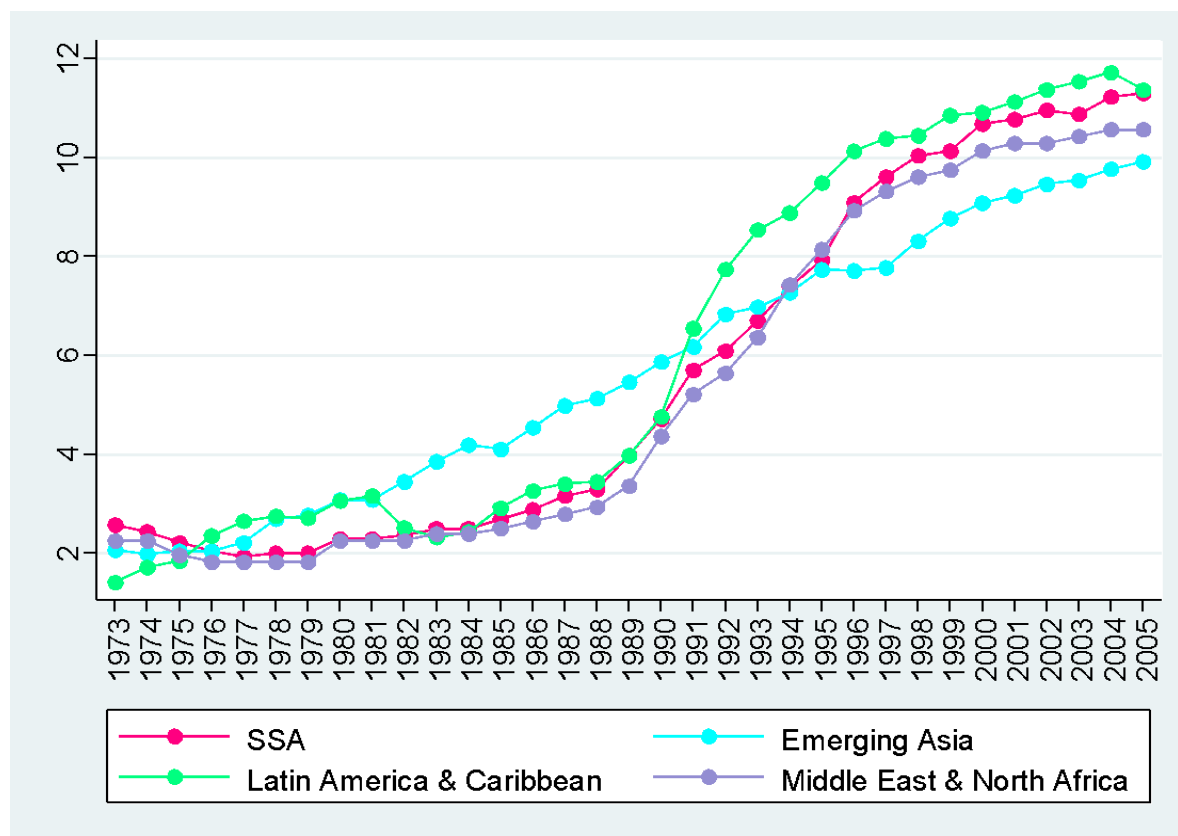Source: authors' calculations based on data from Abiad et al. (2010).

Table 4: Aggregate FLI for 14 SSA countries

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8
Burkina Faso	1.75	1.75	1.75	2.4	6.4	9	10	10
Cameroon	1.75	1.75	1.75	1.75	2.95	7.95	11	11
Cote D'Ivoire	5.75	5.75	5.75	5.75	8.85	11	11	11
Ethiopia	4	0	0	0	1	4.2	5	5
Ghana	0	0	0	2.2	5	5.8	7.4	9
Kenya	3.75	4.15	4.75	4.75	6.2	9.7	10.3	10.5
Madagascar	0	0.8	1.4	4	8.55	10.6	12.95	13.25
Mozambique	1	1	1	1	2.85	11.15	13	13
Nigeria	3.75	2.35	3.75	5.15	7.35	11	13.7	14
Senegal	3.25	2.35	1.75	2.65	9.55	10.4	11.2	12
South Africa	5.25	3.9	6.75	10.05	10.65	12.25	13.25	13.25
United Republic of Tanzania	0	0	0	0	4.6	10.25	13	13
Uganda	2.75	2.75	2.75	3.05	5.9	9.9	11.5	13.5
Zimbabwe	2	2	2	2	5.75	7.8	9.35	9.75

Note: data are available from 1973 to 2005. Period 1=1973–74, period 2=1975–79, period 3=1980–84, period 4=1985–89, period 5=1990–94, period 6=1995–99, period 7=2000–04, period 8=2005. Data ranges from 0 to 15. A higher number implies more liberalization.

Source: authors' calculations based on data from Abiad et al. (2010).

Table 5: Aggregate FLI by region, 1973–2005

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8
Emerging Asia	2.02	2.35	3.54	4.84	6.62	8.06	9.42	9.92
LAC	1.56	2.46	2.7	3.4	7.29	10.26	11.34	11.37
SSA	2.5	2.04	2.39	3.2	6.11	9.36	10.9	11.3
MENA	2.25	1.85	2.31	2.84	5.8	9.15	10.34	10.57

Note: data are available from 1973 to 2005. Period 1=1973–74, period 2=1975–79, period 3=1980–84, period 4=1985–89, period 5=1990–94, period 6=1995–99, period 7=2000–04, period 8=2005. Data ranges from 0 to 15. A higher number implies more liberalization.

Source: authors' calculations based on data from Abiad et al. (2010).

Table 6: Annual averages of private savings rate for developing countries, 1981–2012

Region/country	1981–84	1985–89	1990–94	1995–99	2000–04	2005–09	2010–12	1981–2012
Developing countries	12.61	13.66	17.20	16.15	18.49	17.19	16.91	16.79
Developing countries outside SSA	18.10	17.53	21.49	20.01	20.34	20.14	19.09	19.96
SSA	10.44	11.57	13.23	11.42	15.78	12.88	13.63	13.03
Botswana	31.72	46.43	36.67	31.36	28.69	24.33	22.54	32.27
Gabon			32.82	39.57	42.30	43.56	45.14	40.63
Namibia			24.19	29.90	28.11	26.82	20.52	26.59
Angola						51.67	48.74	50.57
SSA excluding Botswana, Gabon, Namibia, and Angola	9.34	9.86	11.11	9.14	14.28	10.26	11.21	10.98
South Asia	18.96	15.59	20.02	21.37	24.17	22.00	21.31	21.19
MENA	24.68	25.68	29.47	25.31	25.99	28.07	27.42	26.90
LAC	10.94	12.99	15.14	14.96	15.03	15.12	14.57	14.77
EAP	24.68	25.07	28.81	26.76	28.14	29.50	25.59	27.57
Europe and Central Asia		18.93	16.43		17.85	16.59	16.65	16.99

Source: authors' calculations based on data from Grigoli et al. (2018).

Table 7: Private savings rate for SSA countries, average 1981–2012

Country	Mean	SD	Min.	Max.
Angola	50.57	12.58	25.21	70.13
Benin	7.32	5.51	-8.65	14.64
Botswana	32.27	9.93	8.51	56.98
Burkina Faso	6.49	6.08	-9.54	17.31
Burundi	6.69	14.78	-41.41	22.37
Cameroon	12.53	9.68	-37.04	20.40
Cabo Verde	18.10	6.68	4.23	31.39
Central African Republic	-1.18	6.67	-23.49	11.44
Chad	4.01	18.59	-45.53	29.76
Comoros	2.96	4.39	-3.14	12.59
Democratic Republic of the Congo	9.77	3.47	4.47	15.10
Congo	17.35	31.43	-54.21	63.70
Cote D'Ivoire	12.07	6.25	3.70	30.68
Eritrea	24.11	9.48	12.12	37.13
Eswatini	7.31	10.20	-23.02	23.58
Ethiopia	10.02	5.35	1.95	19.88
Gabon	40.63	5.88	26.93	52.78
Gambia	12.07	5.01	4.97	24.36
Ghana	11.48	6.45	-1.43	27.69
Guinea	12.44	7.33	-1.96	25.61
Guinea Bissau	8.93	4.74	2.76	19.39
Kenya	15.22	4.08	7.74	25.14
Lesotho	15.74	7.45	2.84	29.69
Madagascar	10.21	5.43	3.37	20.95
Malawi	17.78	6.99	6.97	32.18
Mali	18.11	6.33	5.42	32.50

Mauritania	7.96	11.57	-8.38	23.52
Mauritius	21.10	5.32	13.08	31.92
Mozambique	0.62	6.94	-7.66	14.96
Namibia	26.59	4.66	18.41	35.81
Niger	7.04	6.08	-1.84	22.31
Nigeria	19.28	15.34	-17.93	49.06
Rwanda	8.36	3.88	0.02	15.29
Senegal	6.73	4.81	-3.24	14.53
Seychelles	18.11	20.14	-13.69	53.59
Sierra Leone	3.04	6.12	-12.23	12.67
South Africa	20.12	3.68	12.19	26.70
Sudan	14.25	3.55	5.63	19.70
Sao Tome and Principe	1.08	16.60	-27.27	21.30
United Republic of Tanzania	8.92	5.75	-6.06	17.10
Togo	1.88	8.74	-18.50	12.22
Uganda	11.25	3.15	5.97	16.22
Total	13.03	13.32	-54.21	70.13

Note: data are available from 1981 to 2012.

Source: authors' calculations based on data from Grigoli et al. (2018).

Table 8: Summary statistics

Variable	SSA				Non-SSA			
	Mean	SD	Min.	Max.	Mean	SD	Min.	Max.
Private saving/GPDI	13.03	13.32	-54.21	70.13	19.96	11.42	-41.27	58.94
Ln real per capita GPDI (PPP)	717.07	85.53	546.26	972.07	825.44	64.2	638.02	1058.29
Real growth rate of per capita GPDI	2.07	12.58	-47.72	127.8	3.54	7.74	-38.4	75.04
Ln terms of trade	465.83	34.53	349.06	623.48	460.09	23.77	324.7	576.44
Public saving/GPDI	6	13.25	-29.58	108.18	4.46	7.55	-20.02	73.93
Real deposit rate	0.26	6.44	-27.5	21.34	1.21	5.52	-26.01	26.53
Flow of private sector credit/GPDI	2.85	4.62	-13.46	43.14	5.81	7.1	-26.96	56.73
Inflation (bounded)	6.97	6.69	-15.01	32.89	6.91	5.89	-9.32	32.94
Old-age dependency ratio	6.2	1.54	3.5	12.66	9.67	4.44	4.25	28.01
Share of urban population	34.23	16.01	4.69	86.46	51.56	19.38	12.43	93.7
Observations	951				1,129			

Note: data are available from 1981 to 2012.

Source: authors' calculations based on data from Grigoli et al. (2018).

Table 9: Determinants of private savings in developing countries

Variables	(1)	(2)	(3)
Lag private saving/GPDI	0.5161***	0.5101***	0.9122***
	(0.0634)	(0.0607)	(0.0833)
Ln real per capita GPDI (PPP)	0.1526***	0.1602**	0.1117
	(0.0548)	(0.0644)	(0.0714)
Real growth rate of per capita GPDI (PPP)	0.2061***	0.2150***	0.3593***
	(0.0379)	(0.0414)	(0.1077)
Ln terms of trade	0.0485**	0.0386**	0.0287

	(0.0192)	(0.0180)	(0.0255)
Public saving/GPDI	-0.3575***	-0.3749***	-0.0358
	(0.1038)	(0.1112)	(0.1488)
Real deposit rate	0.1254	0.1159	0.2255
	(0.1579)	(0.1635)	(0.2417)
Flow of private sector credit/GPDI	-0.1133	-0.1203	-0.2206*
	(0.1159)	(0.1215)	(0.1272)
Inflation	0.2977*	0.2950	0.3713
	(0.1789)	(0.1878)	(0.2617)
Old-age dependency ratio	-1.2581***	-1.1409***	-0.5648
	(0.4537)	(0.4011)	(0.3690)
Share of urban population	-0.2952*	-0.2642	-0.2152
	(0.1669)	(0.1663)	(0.1589)
SSA		5.0102	29.9122
		(4.2882)	(47.6467)
SSA*Ln real per capita GPDI (PPP)			-0.0198
			(0.0744)
SSA*Real growth rate of per capita GPDI (PPP)			-0.2188*
			(0.1206)
SSA*Ln terms of trade			-0.0111
			(0.0284)
SSA* Public saving/GPDI			-0.3899**
			(0.1695)
SSA*Real deposit rate			-0.0465
			(0.2877)
SSA*Flow of private sector credit/GPDI			0.3546
			(0.2496)
SSA*Inflation			-0.1203
			(0.3243)
SSA*Old-age dependency ratio			-0.2942
			(0.8149)
SSA*Share of urban population			0.1638
			(0.2078)
SSA*Lag private saving/GPDI			-0.5363***
			(0.1031)
Constant	-111.9063***	-117.7920***	-89.6532*
	(34.1027)	(42.1826)	(46.9202)
Lags/instruments	1/48	1/49	1/66
AR (1) p-val	0.002	0.003	0.000
AR (2) p-val	0.634	0.608	0.669
Hansen J-test p-val	0.736	0.652	0.737
Observations	2,080	2,080	2,080
Number of countries	103	103	103

Note: standard errors in parentheses are corrected for heteroscedasticity and autocorrelation of the error term. We use two-step systems GMM estimations with collapsed instrument matrix and perform the Windmeijer (2005) correction of the covariance matrix. The null hypothesis for the Hansen J-test is that the full set of instruments is valid. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: authors' calculations based on data from Grigoli et al. (2018).

Table 10: Determinants of private savings in SSA: benchmark regression

	(1)	(2)	(3)
Lag private saving/GPDI	0.3897***	0.3832***	0.4562***
	(0.0620)	(0.0634)	(0.0578)
Ln real per capita GPDI (PPP)	0.1020***	0.1095***	0.0798*
	(0.0332)	(0.0401)	(0.0483)
Real growth rate of per capita GPDI (PPP)	0.1397***	0.1453***	0.2021***
	(0.0399)	(0.0435)	(0.0463)
Ln terms of trade	0.0084	-0.0014	0.0019
	(0.0123)	(0.0141)	(0.0170)
Public saving/GPDI	-0.3770***	-0.3769***	-0.4326***
	(0.1241)	(0.1381)	(0.1136)
Real deposit rate	0.0115	0.0295	0.1765
	(0.1688)	(0.1517)	(0.2331)
Flow of private sector credit/GPDI	0.0972	0.0987	0.0575
	(0.1941)	(0.2261)	(0.3038)
Inflation	0.0936	0.1237	0.3164
	(0.2055)	(0.1972)	(0.2459)
Old-age dependency ratio	-0.8202	-1.1567	-0.8640
	(0.7209)	(0.9077)	(1.1001)
Share of urban population	-0.1203	-0.1393	-0.0558
	(0.1218)	(0.1176)	(0.1536)
WAEMU		2.8119	2.8914
		(2.5946)	(2.9474)
CAEMU		5.9010	9.0511*
		(4.2714)	(4.6340)
WAEMU*Flow of private sector credit/GPDI			0.3107
			(0.5563)
CAEMU*Flow of private sector credit/GPDI			-0.1250
			(0.6431)
WAEMU*Real deposit rate			-0.0379
			(0.2300)
CAEMU*Real deposit rate			-0.3109
			(0.2526)
Constant	-59.6796***	-59.0217***	-45.7464**
	(16.8331)	(18.5776)	(22.4458)
Lags/instruments	1/18	1/20	1/30
AR (1) p-val	0.007	0.009	0.010
AR (2) p-val	0.591	0.579	0.498
Hansen J-test p-val	0.805	0.705	0.349
Observations	951	951	951
Number of countries	42	42	42

Note: standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Source: authors' calculations based on data from Grigoli et al. (2018).

Table 11: Determinants of private savings in SSA: robustness regression

	(1)	(2)	(3)
Lag private saving/GPDI	0.3888***	0.3928***	0.3974***
	(0.0578)	(0.0602)	(0.0699)
Ln real per capita GPDI (PPP)	0.0363	0.0404	0.0780
	(0.0529)	(0.0595)	(0.1363)
Real growth rate of per capita GPDI (PPP)	0.1802***	0.1874***	0.2004***
	(0.0493)	(0.0469)	(0.0668)
Ln terms of trade	0.0022	-0.0000	-0.0038
	(0.0186)	(0.0240)	(0.0349)
Public saving/GPDI	-0.4988***	-0.4886***	-0.4013***
	(0.0720)	(0.0837)	(0.1358)
Inflation	0.2447**	0.2184**	0.2707***
	(0.1005)	(0.0984)	(0.1004)
Old-age dependency ratio	0.8069	0.2656	-1.5341
	(1.3878)	(1.4900)	(3.3504)
Share of urban population	0.0724	0.0719	-0.0180
	(0.2067)	(0.2340)	(0.3935)
Financial liberalization dummy, liberal	1.4426	0.4341	-3.3968
	(4.4160)	(7.4875)	(12.9635)
WAEMU		0.5543	-6.1839
		(3.7664)	(10.1565)
CAEMU		1.8662	30.3649
		(6.2642)	(27.9214)
Liberal*WAEMU			11.5784
			(15.1709)
Liberal*CAEMU			-28.2112
			(21.7298)
Constant	-27.1603	-25.2375	-35.4229
	(30.6056)	(29.8524)	(49.3792)
Lags/instruments	1/16	1/16	1/20
AR (1) p-val	0.008	0.008	0.009
AR (2) p-val	0.266	0.273	0.274
Hansen J-test p-val	0.330	0.201	0.318
Observations	835	835	835
Number of countries	31	31	31

Note: standard errors in parentheses. Financial liberalization dummy takes on the value 0 for years preceding the year of financial reform, and 1 for years after the financial reform. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Source: authors' calculations based on data from Grigoli et al. (2018).

Appendix

Table A1: Countries included in regressions

SSA		Non-SSA	
Angola	Niger	Albania	Myanmar
Benin	Nigeria	Argentina	Nicaragua
Botswana	Rwanda	Armenia	North Macedonia
Burkina Faso	Sao Tome and Principe	Azerbaijan	Pakistan
Burundi	Senegal	Bangladesh	Panama
Cabo Verde	Seychelles	Belize	Papua New Guinea
Cameroon	Sierra Leone	Bolivia (Plurinational State of)	Paraguay
Central African Republic	South Africa	Bosnia and Herzegovina	Peru
Chad	Sudan	Brazil	Philippines
Comoros	Togo	Bulgaria	Republic of Moldova
Congo	Uganda	Cambodia	Romania
Cote D'Ivoire	United Republic of Tanzania	China	Saint Lucia
Democratic Republic of the Congo		Colombia	Saint Vincent
Eritrea		Costa Rica	Serbia
Eswatini		Dominican Republic	Sri Lanka
Ethiopia		Ecuador	Tajikistan
Gabon		El Salvador	Thailand
Gambia		Grenada	Turkey
Ghana		Guatemala	Ukraine
Guinea		Guyana	Venezuela, Bolivarian Republic of
Guinea Bissau		Haiti	Viet Nam
Kenya		Honduras	
Lesotho		Hungary	
Madagascar		India	
Malawi		Indonesia	
Mali		Kyrgyzstan	
Mauritania		Malaysia	
Mauritius		Maldives	
Mozambique		Mexico	
Namibia		Montenegro	

Source: authors' compilation.