# Public bank lending in Africa in times of crisis

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ABSTRACT

This paper examines State-owned bank lending in Africa in times of crisis. We exploit a sample of 112 banks, including 24 State-owned banks, operating in 8 West African countries over the period 2000–2019. We focus on how bank ownership affects lending, during and after crises. Results indicate that, contrary to domestic-private banks, public banks continue to lend at the same rate during and slightly increase their lending after a crisis. The main explanation of the previous finding is the stability of State-owned bank resources. Finally, the countercyclicality of public banks does not affect their profitability or portfolio quality.

## 1. Introduction

The COVID-19 pandemic has brought back to the forefront the importance of the State in maintaining economic activity in times of crisis. While Africa has not been the continent most adversely affected by the pandemic, its economies continue to suffer from external shocks, including economic events, such as commodity price booms and busts, as well as many non-economic shocks ranging from civil conflicts to natural disasters and other epidemics. Africa's extreme vulnerability is explained by a high level of exposure to these shocks for structural reasons (e.g., a lack of diversification for commodity price busts). African countries also suffer from a lack of resilience. Existing private mitigation instruments, such as insurance or credit, are underdeveloped on the continent. External resources, especially foreign aid and remittances, can help to absorb major shocks, but these flows are not in the hands of domestic actors.

In this context, the State's role as a stabilizer of economic activity is particularly crucial in Africa. One of the most valuable stabilizing tools governments have at their disposal is State-owned banks.[1] On the continent, public authorities have limited room to intervene during a crisis because they struggle to mobilize internal resources and often have high debt levels. However, public banks benefit from their own resources and are often able to borrow, even during a crisis. In addition, State-owned banks are not marginal players in Africa. Even if we lack a clear overall view of State-owned banks across the world, a comparison with other papers indicates that these actors are more important in Africa than elsewhere. Our data reveal that State-owned banks account for more than one-fifth of the banks in (West) Africa, while they represent approximately 10% of the banks in the rest of the world (see Table A1 in Appendix). The role of State-owned banks is even greater in least (financially) developed countries such as Niger and Mali.

Several arguments are advanced to explain why State-owned banks are able to lend in times of crisis. First, State-owned banks have a mandate (implicit or explicit) to stabilize economic activity (Brei and Schclarek, 2015; Behr et al., 2017). Second, the model of State-owned banks is more conducive to maintaining their business in times of crisis, because they benefit from more stable resources (de Luna-Martinez and Vicente, 2012) and/or a state guarantee, which reassures their creditors and depositors (Brei and Schclarek, 2015).

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[1] In the rest of the paper, we employ interchangeably the terms public banks and State-owned banks.

In addition, their loans are primarily oriented towards corporate loans (de Luna-Martinez and Vicente, 2012), and needs for funds are likely to increase during a crisis. A final argument is that State-owned bank lending is less sensitive to macroeconomic evolution because their lending decisions are more politically driven (Dinç, 2005; Khwaja and Mian, 2005).

The analysis of State-owned bank lending in Africa in times of crisis is of prime interest but is lacking in the literature. Several academic studies have empirically shown that public banks are less procyclical than private banks. However, these works have focused mainly on international comparisons (Micco and Panizza, 2006; Bertray et al., 2015; Chen et al., 2016) or on case studies from other continents, especially Latin America and Eastern Europe (Brei and Schclarek, 2013; Brei and Schclarek, 2018; Cull and Martinez Peria, 2013; Frigerio and Vandone, 2020).[2] Evidence from other regions cannot be extrapolated to Africa, due to the high significance of external shocks and the particular weight of State-owned banks there. Furthermore, there is no guarantee that the presence of State-owned banks is mechanically beneficial in mitigating the effects of shocks in all countries, especially in those without good institutions (Bertray et al., 2015; Chen et al., 2016; Frigerio and Vandone, 2020).

This paper fills this gap by examining how bank ownership structure in eight West African countries influences bank lending in times of crisis. To do so, we first hand-collected data from the range of banks operating from 2000 to 2019 in the West African Economic and Monetary Union (WAEMU), which includes Benin, Burkina-Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo. Our final sample covers 112 banks. Among them, the State is the main shareholder in 24 banks and a minority shareholder in 30 others. To empirically examine how State-owned banks behave during crises, we operate in two steps. First, we identify macroeconomic shocks, which we define as occurring when a country's one-year GDP growth fell significantly below its 1995–2019 average. We identify 7 events across the eight countries. Second, we examine whether public, domestic private, and foreign banks contracted their lending during a crisis year and in the three years following it.

The baseline analysis provides four main findings. First, lending decreases not only during a crisis but also afterwards. Second, in the year of a crisis, public banks continue to lend at the same rate as during normal times, while private-owned firms contract their lending. Third, we document that State-owned banks not only maintain their lending in the wave of a crisis but also afterwards. Finally, we show that (private) banks where the State is a minority shareholder behave like other private banks, indicating that the State must hold the majority of a bank's shares in order to shape its behavior during a crisis.

We address additional questions in the remainder of the paper. We first identify channels that may explain why State-owned banks maintain their lending levels in times of crisis. We find public banks have stable resources, while private banks experience a decline in deposits after a shock. This finding suggests that State-owned banks benefit from an implicit insurance provided by the State (Brei and Schclarek, 2015). We also test the political view, which argues that government-owned banks are more sensitive to the electoral calendar than to economic growth (Dinç, 2005). Empirical results do not support this view. State-owned banks in the WAEMU are not sensitive to the timing of (presidential) elections in these countries. Unfortunately, we cannot test two additional arguments often advanced to explain the countercyclicality of State-owned banks. We cannot reject the hypothesis that public banks also benefit from an (implicit or explicit) mandate to support economic activity during downturns (Brei and Schclarek, 2015; Behr et al., 2017). However, we do not believe that the positive role of public banks is explained by the composition of a portfolio oriented towards firms (whose demand increases during crises), contrary to private banks that also serve households. Almost all loans provided by banks in the WAEMU are oriented towards firms rather than households (Léon, 2018).

Finally, we ask whether the countercyclicality of public banks in the wake of a shock comes with a degradation of public bank health (Bertray et al., 2015; Coleman and Feler, 2015; Chen et al., 2016). To test this possibility, we examine the evolution of performance and portfolio quality of State-owned banks in the wave of a crisis. Contrary to expectations, public banks do not experience a contraction of their performance or health during or after a shock.

This paper adds to the literature on State-owned bank lending in times of crisis in two ways. First, to our knowledge, this paper is the first to specifically investigate the role of State-owned banks in Africa during times of crisis. As explained above, results from existing studies cannot be extrapolated to Africa due to differences in terms of economic instability, institutional frameworks, and the importance of public banks in Africa. To our knowledge, only one paper has examined the countercyclicality of State-owned banks in Africa. Zins and Weill (2018) investigated the procyclicality of loans of foreign-owned, State-owned and domestic private banks.[3] Their results indicate that public banks are not less procyclical than private domestic banks. Our paper complements this paper in several ways. First, Zins and Weill (2018) assessed the sensitivity of lending to economic growth without distinguishing booms and busts. However, the role of public banks is particularly important during downturns, when private financial flows dry up. Second, we exploited a sample of all banks operating in eight West African countries. International databases, such as those used by Zins and Weill (2018), are useful, but they miss many (small and local) banks in Africa, including many State-owned banks. For instance, for the eight countries considered here, Zins and Weill (2018) collect information on only 24 banks (including only one public bank). Our dataset thus allows us to provide a more complete picture.

The second contribution of this paper consists of extending the window beyond the contemporary effect. Existing works have limited their analysis to crisis years by studying bank behavior only during a shock (e.g., the 2008–9 global financial crisis) but

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[2] Table A1 in Appendix provides a description of each paper. As indicated in Table A1 (panel B), African banks are sometimes included in international comparisons, but they account for a small number of banks considered, and they are not specifically scrutinized. In detail, we observe that existing studies often signal that public banks are countercyclical in Latin America, while evidence from European countries is less clear-cut.

[3] Zins and Weill (2018) focused on the countercyclical behavior of foreign banks in Africa and considered public banks as a control group. Their paper includes not only banks from sub-Saharan Africa (as ours) but also banks from four North African countries. The latter group accounts for more than one third of the observations.

ignoring the behavior of banks after a downturn. One exception is the study of Coleman and Feler (2015), which examined how public banks reacted to the 2008–09 Global Financial Crisis (GFC) in Brazil by exploiting data from 2005 to 2013. The authors document that State-owned banks not only continued to lend during the GFC but also during the post-crisis period. We extend this approach by considering other macroeconomic shocks. We do not focus specifically on the GFC, because the countries in our sample were not clearly impacted by this event (as confirmed in robustness checks) and suffer from other major shocks, notably civil conflicts or commodity price busts. Our findings are in line with Coleman and Feler (2015). State-owned banks are not only able to react immediately during a downturn but also provide support to borrowers after a crisis.

Finally, this work contributes to a scant literature on recent changes in banking markets in Africa, especially in the WAEMU. Using data similar to ours, several papers have focused on the emergence of pan-African banks in the WAEMU zone and their impact on competition, stability and performance (Léon, 2016; Kanga et al., 2020, 2021; Saidane et al., 2021). However, there is no study on the role of State-owned banks in these countries, which are non-negligible players in West African financial markets as they account for one fifth of banks. We fill this gap in our paper.

The rest of the paper is organized as follows. Section 2 presents the data used. Section 3 describes our estimation approach. Section 4 discusses the results, and the final section concludes the study.

## 2. Data description

### 2.1. Data

The primary data come from three main files published by the WAEMU Banking Commission or the Central Bank (BCEAO). The WAEMU is made up of eight countries (Benin, Burkina-Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo), which share a common currency and banking regulatory and supervisory framework. These countries are among the least developed economies but there is a strong heterogeneity across countries. The WAEMU financial systems are mainly bank-based and have experienced rapid growth over the past two decades. For instance, the ratio of domestic credit to the private sector relative to GDP increased from +7 points in Niger to +19 points in Burkina Faso between 2000 and 2019.[4] The number of active banks in the WAEMU increased from 86 in 2000 to 136 in 2019. However, financial development and inclusion remain limited in all eight countries, even in the most financially developed countries of Côte d'Ivoire and Senegal.

We first hand-collected the annual balance sheets and income statement data for all banks operating in the WAEMU from 2000 to 2019. Initial files are available online at the Central Bank website (in pdf format). We complemented the financial data with information on bank ownership taken from annual directories ("*Annuaires*"). Finally, we collected additional information, such as the number of employees or branches, by extracting figures reported in the Appendix of the Central Bank of West African States (BCEAO)'s annual reports. These documents also provide the share of capital owned by the State, domestic private entities, individuals, and foreigners, which allowed us to cross-check the information provided in the annual directories. Information for all banks was combined using a unique code (called "*immatriculation*"). This common identification number allows us to follow a bank over time regardless of any name changes.[5]

### 2.2. Sample selection

We identified 187 different institutions operating in eight countries from 2000 to 2019. To construct the sample, we applied the following filters.

We first excluded 39 non-bank financial intermediaries (financial intermediaries are classified between banks and non-bank FIs). We then dropped five banks[6] due to the difficulty of classifying them as strictly public or private banks. Indeed, the State was a majority owner of these five banks but only during a short period of time (less than 5 years). To avoid results driven by outliers, we also excluded the bottom and top 1% of loan growth. Finally, we dropped 31 banks with a limited number of observations, i.e., with less than six consecutive years (we consider at a minimum of five years of growth in the analysis).

The final sample includes 112 banks (1490 observations) ranging from four banks in Guinea Bissau to 26 in Côte d'Ivoire, as indicated in Table 1.

### 2.3. Ownership of banks

#### 2.3.1. State ownership

Our main interest variable is the State ownership of banks. There are two main approaches to classify a bank as a State-owned bank. The first approach defines a bank as State-owned if a public authority holds more than 50% of the bank's equity capital (Brei and Schclarek, 2013; Brei and Schclarek, 2018; Cull and Martinez Peria, 2013). The second approach relies on the ultimate owner (Bertray et al., 2015; Zins and Weill, 2018). Even if the State holds less than the absolute majority of a bank's equity capital, it may influence

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[4] Data were extracted from World Development Indicators.
[5] Compiled dataset is available on the author's website (https://sites.google.com/site/florianleon/home).
[6] The list includes Banque internationale du Bénin, Banque Africaine pour l'Industrie et le Commerce, Coris Bank, Banque Internationale pour l'Afrique au Niger and Banque Internationale pour l'Afrique au Togo.

**Table 1**
Sample description.

| | All banks | Public banks | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Nb. (obs.) | Nb. (obs.) | Asset | Loan | Deposit | Staff | Accounts | Branch |
| Benin | 11 (161) | 1 (7) | 1.0 | 1.1 | 1.2 | 2.5 | 1.2 | 1.8 |
| Burkina | 14 (167) | 4 (45) | 12.2 | 13.8 | 18.7 | 22.4 | 22.7 | 19.6 |
| Côte d'Ivoire | 26 (335) | 5 (61) | 9.4 | 8.8 | 9.1 | 17.2 | 22.1 | 21.9 |
| Guinea-Bissau | 4 (49) | 0 (0) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Mali | 14 (209) | 5 (72) | 44.9 | 44.6 | 49.1 | 43.1 | 52.4 | 52.0 |
| Niger | 11 (148) | 4 (42) | 28.2 | 28.5 | 31.5 | 31.1 | 21.2 | 26.3 |
| Senegal | 21 (227) | 2 (26) | 6.4 | 8.0 | 2.8 | 8.9 | 9.7 | 10.1 |
| Togo | 11 (144) | 3 (46) | 32.0 | 33.8 | 43.3 | 43.1 | 37.0 | 40.6 |
| **TOTAL** | **112 (1440)** | **24 (299)** | **15.0** | **15.6** | **15.7** | **20.8** | **23.7** | **25.6** |

decisions if other owners are minority holders.

We follow the second approach and classify a bank as State-owned if the main shareholder is a public authority (as the central government, the local government or another public entity). To identify the main shareholder, we rely on directories that list each bank's main shareholders by year. According to our approach, 24 out of 112 banks are State-owned (see Table 2 for the list). Five of them changed their status over the period, with one becoming a public bank (Versus bank in Côte d'Ivoire) and four became private banks (Continental Bank in Benin, BIB in Burkina Faso, BIM in Mali, and BIN in Niger). Table 2 reveals some interesting features on the ownership structure of public banks. The State holds between 25% and 100% of capital in public banks. Public ownership exceeds 50% in ten banks (with four of them being exclusively owned by the State).

State-owned banks account for 21% of banks (24 out of 112), which is a large ratio in comparison with other studies on public banks (See Table A1). The number of State-owned banks ranges from zero in Guinea-Bissau to five in Côte d'Ivoire and Mali. The size of public banks in terms of activity is rather limited in Benin, Senegal and Côte d'Ivoire (less than 10% of assets), but they play an important role in Mali, Togo and Niger (accounting for more than a third of assets). In Mali, three State-owned banks account for 10% or more of market share. The largest public bank in Niger holds almost one-fifth of the assets of the banking system. In Togo, the two largest State-owned banks account for 15% of the banking system's assets.

Public banks are, on average, smaller than their private counterparts. However, they play a major role in terms of financial inclusion, as highlighted in Table 1. They account for one quarter of all accounts and bank branches. In particular, public banks operate not only in primary cities, but often have branches in remote areas, contrary to many private banks.

### 2.3.2. Foreign ownership

While this paper focuses on State-owned banks, we also consider how foreign-owned banks behave in the wave of a crisis. The majority of private banks operating in the WAEMU are foreign-owned. Historically, foreign banks are Western banks, mainly from France, such as BNP Paribas or Société Générale. In recent decades, (West) Africa has experienced the expansion of foreign banks with roots in Africa (Léon, 2016). Two of the largest pan-African banking groups are from the WAEMU (Ecobank and Bank of Africa). We therefore distinguish between foreign banks from Africa and foreign banks from other continents. We rely on ownership structure and apply the same definition as previously for State-owned banks. We classify a bank as foreign-owned if the main shareholder is foreign. We then identify the origin of the main shareholder. We classify bank as a foreign bank from Africa if the main shareholder is foreign but from Africa (including from North Africa, due to the number of Moroccan banks in the WAEMU) and from other continents if the main shareholder is non-African.[7]

### 2.4. Credit growth

The dependent variable is the annual growth rate of customer loans in local currency and is deflated using the national GDP deflator (base 100 = 2015). The dependent variable therefore excludes interbank lending. We do not have information on the breakdown of customer loans into firm loans and household loans. However, more than 90% of loans in the WAEMU are allocated to firms (Léon, 2018).

As indicated in the summary statistics (Table 3), credit growth has been impressive in the WAEMU (+23%) and reflects the development of the banking industry over the past two decades. Table 4 shows credit growth of public banks is lower on average than the credit growth provided by private banks, although the difference is not statistically significant. By breaking down the credit growth of private banks according to their ownership structure, we see that the credit growth provided by domestic banks is impressive and largely exceeds the growth of public bank lending. We do not see a statistical difference in terms of credit growth between State-owned banks and foreign-owned banks. However, a comparison of foreign African banks and those from other countries provides an

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[7] It should be noted that this classification is subject to limitation. Classifying a bank by its ownership structure is a standard, albeit limited, approach. A bank can be rooted in Africa (because of its origin, location of its headquarter, its main interests) but its major shareholder can be non-African. In addition, a change in ownership structure may induce a change in status, while nothing has really changed for day-to-day business operations (as Bank of Africa Mali when BMCE [Morocco] became the main shareholder of Bank of Africa Group).

**Table 2**
List of public banks.

| Name | Country | Period[a] | Current | Creation | Pub. Share[b] | Mkt Share[c] |
|---|---|---|---|---|---|---|
| *Continental Bank* | *Benin* | *2000–08* | *Foreign* | *1992* | *44* | *5.83* |
| Banque agricole et commerciale du Burkina | Burkina | 2000–08 | Exit | 1979 | 25 | – |
| *Banque internationale du Burkina* | *Burkina* | *2000–07* | *Foreign* | *1974* | *48* | *6.49* |
| Banque commerciale du Burkina | Burkina | 2000–19 | Public | 1988 | 44 | 3.12 |
| International Business Bank | Burkina | 2006–19 | Public | 2005 | 39 | 2.32 |
| Banque pour le financement de l'Agriculture | Côte d'Ivoire | 2006–13 | Exit | 2004 | 78 | – |
| Banque Nationale d'Investissement | Côte d'Ivoire | 2000–19 | Public | 1999 | 100 | 6.09 |
| Banque de l'Habitat de Côte d'Ivoire | Côte d'Ivoire | 2000–19 | Public | 1993 | 40 | 0.76 |
| Versus *Bank* | *Côte d'Ivoire* | *2009–19* | *Public* | *2003* | *100* | *0.71* |
| Banque Populaire (ex-CNCE) | Côte d'Ivoire | 2010–19 | Public | 2009 | 100 | 0.48 |
| Banque de l'Habitat du Mali | Mali | 2000–13 | Exit | 1991 | 84 | – |
| Banque de Développement du Mali | Mali | 2000–19 | Public | 1968 | 26 | 17.63 |
| Banque Malienne de Solidarité | Mali | 2002–19 | Public | 2002 | 35 | 17.29 |
| Banque Nationale de Développement Agricole | Mali | 2000–19 | Public | 1982 | 36 | 9.94 |
| *Banque internationale pour le Mali* | *Mali* | *2000–08* | *Foreign* | *1980* | *62* | *6.87* |
| Crédit du Niger | Niger | 2000–09 | Exit | 1967 | 65 | – |
| Société Nigérienne de Banque | Niger | 2000–19 | Public | 1994 | 32 | 18.91 |
| Banque Agricole du Niger | Niger | 2010–19 | Public | 2011 | 95 | 5.84 |
| *Banque islamique du Niger pour le Commerce et l'investissement* | *Niger* | *2000–09* | *Foreign* | *1997* | *34* | *3.14* |
| Banque Agricole (ex: CNCAS) | Senegal | 2000–19 | Public | 1984 | 25 | 4.37 |
| Banque Nationale de Développement Economique | Senegal | 2013–19 | Public | 2013 | 33 | 2.82 |
| Banque togolaise de développement | Togo | 2000–12 | Exit | 1974 | 61 | – |
| Union Togolaise de Banque | Togo | 2000–19 | Public | 1977 | 100 | 8.97 |
| Banque togolaise pour le commerce et l'industrie | Togo | 2000–19 | Public | 1974 | 57 | 7.74 |

a: Period under which the bank is classified as public. b: Average value of public ownership over the period (in %). b: National market share (in 2019, %). In italics, we report banks that had a change in status over the period. Banks changing status over the period are in italics.

**Table 3**
Summary statistics.

| Variable | Obs. | Mean | Std. Dev. | Min. | Max. |
|---|---|---|---|---|---|
| Credit growth | 1490 | 0.231 | 0.691 | −0.54 | 9.46 |
| Public | 1490 | 0.201 | 0.401 | 0 | 1 |
| Foreign | 1490 | 0.712 | 0.453 | 0 | 1 |
| GDPpc growth | 1490 | 0.018 | 0.027 | −0.08 | 0.08 |
| Crisis (baseline) | 1490 | 0.034 | 0.182 | 0 | 1 |
| Crisis (robust 1) | 1490 | 0.047 | 0.212 | 0 | 1 |
| Crisis (robust 2) | 1490 | 0.094 | 0.292 | 0 | 1 |
| Total assets | 1490 | 216,612 | 252,139 | 1025 | 2,221,183 |
| Equity | 1489 | 0.127 | 0.203 | 0 | 1.93 |
| Loan/TA | 1490 | 0.554 | 0.146 | 0.07 | 0.91 |
| Deposit | 1487 | 0.692 | 0.186 | 0 | 2.58 |
| Liquidity | 1207 | 0.244 | 0.135 | 0.01 | 0.72 |

**Table 4**
Difference of main variables, by ownership.

| | State-owned | Private (all) | Domestic private | Foreign private | Foreign (Africa) | Foreign (no Africa) |
|---|---|---|---|---|---|---|
| Credit growth | 0.173 | 0.246 | 0.411** | 0.226 | 0.277** | 0.114* |
| Total assets (log) | 11.59 | 11.71 | 11.82* | 11.69 | 11.62 | 11.81** |
| Equity to total assets | 0.120 | 0.129 | 0.077** | 0.135 | 0.159** | 0.090** |
| Loan to total assets | 0.578 | 0.549*** | 0.567 | 0.546*** | 0.533*** | 0.570 |
| Deposits | 0.732 | 0.682*** | 0.677** | 0.682*** | 0.654*** | 0.743 |
| Liquid ratio | 0.186 | 0.259*** | 0.248*** | 0.260*** | 0.262*** | 0.257*** |
| RoA | −0.009 | −0.004 | −0.005 | −0.004 | −0.008 | 0.004 |
| RoE | 0.082 | 0.237** | 0.174 | 0.245** | 0.193** | 0.332*** |
| Provisions | 0.022 | 0.014*** | 0.010** | 0.014*** | 0.016* | 0.011*** |
| *Z*-score | 34.41 | 28.56 | 27.35 | 28.70 | 36.71 | 11.71 |
| *Obs.* | *299* | *1191* | *130* | *1061* | *720* | *341* |

***, **, * correspond to the 1%, 5%, and 10% levels of statistical significance difference between value for State-owned banks and other groups.

interesting finding. Foreign African-owned banks experienced higher growth than State-owned banks, while the reverse is true of foreign banks from other countries.

*2.5. Identification of crises*

We combine bank-level data with information about crises. Existing studies differ in the indicators of business cycles and, therefore, in the econometric model used. Several papers have assessed the sensitivity of credit growth to macroeconomic growth (Micco and Panizza, 2006; Bertray et al., 2015; Zins and Weill, 2018). These articles examine whether lending follows the business cycle, i.e., whether it increases during expansion phases and decreases during slowdowns. Another approach consists of studying lending growth during a crisis, such as the 2008–09 GFC (Cull and Martinez Peria, 2013; Coleman and Feler, 2015; Chen et al., 2016). Our paper follows the second approach. Contrary to existing studies, we do not focus specifically on the 2008–09 financial crisis because the countries under investigation were not directly impacted by this event but suffer from other idiosyncratic shocks, such as commodity price busts and civil conflicts.

We develop a trackable method to identify country-specific shocks, exploiting the evolution of GDP growth in each country over the period from 1995 to 2020.[8] We consider that a country experienced a crisis when it experienced a sharp decline in GDP growth. To identify such episodes, we operate in two steps, in line with the methodology employed to measure instability (Cariolle and Goujon, 2015).

First, we extract the cyclical component of growth for each country over the period 1995–2020. This step requires to choose the appropriate method of calculating the trend around which GDP growth fluctuates. There are two main approaches in the literature: parametric approach and filter approach (Cariolle and Goujon, 2015). We follow the former approach by using the Hodrick-Prescott filter in order to decompose the growth between the trend and the cyclical component. We employ a smoothing parameter equal to 6.25.

In the second step, we exploit the evolution of cyclical component of growth to distinguish between slowdowns and crises. We cannot consider a crisis for each period where growth is below the trend. Only strong (negative) deviations between observed growth and trend can be considered as a crisis. To detect them, we rely on the distribution of cyclical component of growth for each country. We consider that a contraction of GDP was noticeable if (the cyclical component of) growth was lower than one standard deviation of distribution of this variable. We also impose that observed growth was negative.[9] In Appendix (Figs. A1 and A2), we present the examples of two countries (Côte d'Ivoire and Guinea-Bissau).[10]

By applying our methodology, we identify seven crises from five countries: Côte d'Ivoire (2003,2011); Guinea Bissau (1998); Mali (2000,2012); Niger (1999–2000) and Togo (2005). As indicated in Table A3, five of these crises are due to internal conflicts and two are explained by low price of commodity exported by the country (Mali 2000 and Togo 2005).

Based on the identification of crisis years, we create a dummy equal to one if country c experienced a crisis in year t. We also create a variable for post-crisis years. If a shock occurred in *t*, we create a dummy variable equal to 1 in the three years after a shock. The post-crisis variable takes a value of 0 if there is a shock in the same year.

In the robustness checks, we consider three alternative approaches to identify a crisis. First, we employ a parameter approach to decompose growth between the trend and the cyclical component. To do so, we regress GDP growth on a trend and extract the residual. We identify the same seven crises plus one additional crisis (Togo 2000). We also extend the period considered as a crisis for two of them (Côte d'Ivoire 2001–03 and Togo 2004–05).

Second, we consider a very simple indicator based on the value of GDP growth. We consider a crisis if GDP growth is negative. We identify a total of 11 events including the seven plus one crises previously identified and three additional downturns (two in Guinea-Bissau and one in Togo).

Finally, we apply the baseline approach on GDP per capita growth instead of GDP growth. While a decline in GDP per capita growth implies a reduction of living standards, it is less clear if it reflects a decline in economic activity, especially in countries with high demographic growth (as in Sahelian countries). By relying on this indicator, we identify not only the crises already identified but also ten additional events (see Table A2 in Appendix for the list). Interestingly, the ten additional events identified are due to poor harvests due to unfavorable weather conditions (7), low price of commodity prices (3), disturbances in neighborhood (3) and inflation pressure (1). Details on all crises identified using the different approaches are provided in Table A2.

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[8] We began the analysis in 1995 due to the devaluation of the franc in 1994. GDP figures indicate a structural break in 1994 due to this major event. We test the stationarity of GDP, GDP per capita, GDP growth and GDP per capita growth for all countries. Results based on several unit root tests indicate that GDP and GDP per capita have a unit root. However, GDP growth and GDP per capita growth were stationary between 1995–2020 in all countries (tests available upon request).

[9] In practice, we do not observe situation where our approach identifies a crisis in a context of a positive growth.

[10] Just consider the case of Côte d'Ivoire in Fig. A1. Panel A displays the observed GDP growth (in blue) and trend approximated by HP filter (in red). Panel B plots the cyclical component of GDP growth in blue (obtained from the difference between observed growth and trend). Dashed-red line reports the threshold set a one-standard deviation (sd = 2.66). We therefore identify a crisis if (cyclical component part of) growth is lower than this threshold. We identify two crises displayed by grey areas. In Fig. A2, for Guinea-Bissau, we identify several periods of negative growth. However, only one event is considered as a sharp contraction according to our measure.

## 3. Methodology

We first consider a model which investigates how lending is affected during crisis periods and how bank ownership mitigates the effect of crisis, in line with existing papers (Brei and Schclarek, 2013; Brei and Schclarek, 2018; Cull and Martinez Peria, 2013), as follows[11]:

$$Credit\_Gr_{i,c,t} = \alpha_i + \beta_1 Crisis_{c,t} + \beta_2 Crisis_{c,t}*Public_i + \beta_3 Crisis_{c,t}*Foreign_i + \nabla X_{i,t-1} + \mu_t + \varepsilon_{i,c,t} \tag{1}$$

where $Crisis_{c,t}$ is a dummy variable equal to 1 if there is a downturn in country $c$ at year $t$ (as defined in Section 2.5). A major difference from existing works consists of the definition of a crisis dummy based on country growth evolution (and not on the 2008–9 financial crisis). Our main variable of interest is the interaction between the Public and crisis dummies. We also control for interactions between a crisis and a dummy for foreign bank ownership (we consider two types of foreign-owned banks, as explained above). We expect that $\beta_1 < 0$, indicating that loan growth would be reduced during a crisis. State-owned banks would be less procyclical if $\beta_2 > 0$ and even countercyclical if $\beta_1 + \beta_2 > 0$ (the same analysis can be applied for foreign owned banks by substituting $\beta_2$ by $\beta_3$).

To ensure identification, we add bank fixed effects ($\alpha_i$), allowing us to control for all unobserved time-constant bank characteristics, notably ownership structure (almost all State-owned banks remained public over the whole period). Time fixed effects ($\mu_t$) allow us to control for common shocks (such as monetary policy that is common in the WAEMU). We finally add several bank-level control variables ($X_{i,t-1}$). The log of total assets (in constant local currency) controls for bank size. The ratio of equity to total assets is added to control for bank soundness. We also include the ratio of loans to assets, which represents the relative percentage of lending in bank's activities. The liquidity ratio, constructed as the ratio of liquid assets to total assets, allows us to measure bank soundness and its ability to sustain lending. Finally, we include deposits over total liabilities as a measure of the stability of a bank's funding (non-deposit funding tends to disappear quickly during periods of instability). In line with previous works, all bank-level control variables are one-year lagged. The description of variables is displayed in Table A3.

Next, we extend Eq. (1) by adding a dummy for post-crisis years and its interactions with public and foreign owned dummies, in line with Coleman and Feler (2015). To do so, we add a post-crisis dummy as follows:

$$\begin{aligned} Credit_{Gr_{i,c,t}} = & \alpha_i + \beta_1 Crisis_{c,t} + \beta_2 Crisis_{c,t}*Public_i + \beta_3 Crisis_{c,t}*Foreign_i + \delta_1 Post - Crisis_{c,t} + \delta_2 Post - Crisis_{c,t}*Public_i + \delta_3 Post \\ & - Crisis_{c,t}*Foreign_i + \nabla X_{i,t-1} + \mu_t + \varepsilon_{i,c,t} \end{aligned} \tag{2}$$

where $Post - crisis_{c,t}$ is a dummy variable equal to 1 if a crisis occurs during the three previous years, and 0 otherwise. Coefficient $\beta_1$ signals the contemporaneous effect of downturns on credit growth (expected to be negative). Coefficient $\delta_1$ provides an indication of lending growth in the three years after a bust. We are agnostic about its sign. On the one hand, we may observe a rapid recovery after a shock and higher credit growth (positive coefficient). On the other hand, it may take time to bounce back, and recovery may be slow (negative coefficient) as in Brazil after the GFC (Coleman and Feler, 2015). The coefficients associated with the interaction between crisis and post-crisis dummies and State ownership give us information about the role of public banks during and after a downturn. We expect that $\beta_2 > 0$ if public banks acted less procyclically during a crisis. If State-owned banks spur recovery, we expect to observe a positive sign for coefficient $\delta_2$. The same analysis can be done for foreign owned banks by scrutinizing coefficients $\beta_3$ and $\delta_3$, respectively.

## 4. Results

### 4.1. Main results

#### 4.1.1. Baseline model

We study how banks react during a major macroeconomic shock. We first present a model including only crisis years in columns 1 to 4 of Table 5 (Eq. (1)). In the first column, we ignore the interaction between the crisis dummy and bank ownership dummies to present the net impact of crises on lending growth. We then incorporate an interaction between the crisis dummy and the State-owned bank dummy in column (2). In the following two columns, we include interactions between the crisis dummy and the foreign-owned bank dummies. Column (3) considers all foreign banks as a whole and in column (4) we distinguish between foreign banks from Africa and from other continents.

In line with expectations, we observe in column (1) a decline in lending growth during crises by 13%, which is rather important (average of loan growth equals 23%). We then consider how bank ownership mitigates or exacerbates the decline in loans, with a special attention to public ownership. Columns (2) to (4) document that State-owned banks continue to lend at the same rate than in normal times. The coefficient associated with interaction between crisis dummy and Public ownership ($\beta_2$) is positive and statistically significant in the three specifications considered. In addition, we display at the bottom of the Table 5 the net effect of crisis for public banks ($\beta_1 + \beta_2$). We document a null effect indicating that State-owned banks continue to lend at the same rate than before a crisis.

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[11] Another approach, adopted by Zins and Weill (2018) for African banks, consists of assessing the sensitivity of credit growth to economic growth (cf. Table A1 in the Appendix). This approach does not allow us to consider crisis and post-crisis years explicitly. For the sake of comparison, we present in Appendix B the results from using this approach by mimicking existing works (Bertay et al., 2015; Zins and Weill, 2018). We provide very similar findings to those of Zins and Weill (2018).

**Table 5**
Lending behavior during and after a crisis.

|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Crisis | −0.132** | −0.175** | −0.455*** | −0.449*** | −0.149** | −0.211*** | −0.697*** | −0.696*** |
|  | (−2.31) | (−2.57) | (−3.88) | (−3.80) | (−2.15) | (−2.70) | (−4.21) | (−4.29) |
| Crisis x Public |  | 0.149 | 0.429*** | 0.423*** |  | 0.219 | 0.698*** | 0.697*** |
|  |  | (1.27) | (2.92) | (2.86) |  | (1.60) | (3.60) | (3.64) |
| Crisis x Foreign |  |  | 0.322** |  |  |  | 0.558*** |  |
|  |  |  | (2.25) |  |  |  | (2.83) |  |
| Crisis x Foreign (Africa) |  |  |  | 0.225 |  |  |  | 0.485** |
|  |  |  |  | (1.55) |  |  |  | (2.52) |
| Crisis x Foreign (no Africa) |  |  |  | 0.423** |  |  |  | 0.627*** |
|  |  |  |  | (2.45) |  |  |  | (2.74) |
| Post-Crisis |  |  |  |  | −0.0359 | −0.0931 | −0.550** | −0.555** |
|  |  |  |  |  | (−0.43) | (−0.92) | (−2.27) | (−2.29) |
| Post-crisis x Public |  |  |  |  |  | 0.211 | 0.667** | 0.675*** |
|  |  |  |  |  |  | (1.58) | (2.61) | (2.64) |
| Post-crisis x Foreign |  |  |  |  |  |  | 0.545** |  |
|  |  |  |  |  |  |  | (2.12) |  |
| Post-crisis x Foreign (Africa) |  |  |  |  |  |  |  | 0.614** |
|  |  |  |  |  |  |  |  | (2.20) |
| Post-crisis x Foreign (no Africa) |  |  |  |  |  |  |  | 0.450* |
|  |  |  |  |  |  |  |  | (1.83) |
| Total assets (log) | −0.455*** | −0.455*** | −0.456*** | −0.459*** | −0.457*** | −0.460*** | −0.483*** | −0.483*** |
|  | (−4.67) | (−4.67) | (−4.67) | (−4.69) | (−4.75) | (−4.81) | (−5.23) | (−5.20) |
| Equity to total assets | 0.162 | 0.165 | 0.163 | 0.164 | 0.158 | 0.171 | 0.125 | 0.120 |
|  | (0.39) | (0.40) | (0.39) | (0.39) | (0.38) | (0.41) | (0.31) | (0.29) |
| Loan to total assets | −2.122*** | −2.123*** | −2.124*** | −2.119*** | −2.124*** | −2.126*** | −2.168*** | −2.167*** |
|  | (−4.57) | (−4.57) | (−4.56) | (−4.56) | (−4.58) | (−4.62) | (−4.72) | (−4.73) |
| Deposits | −0.769** | −0.765** | −0.768** | −0.766** | −0.779** | −0.767** | −0.805** | −0.810** |
|  | (−2.37) | (−2.35) | (−2.36) | (−2.35) | (−2.45) | (−2.41) | (−2.57) | (−2.58) |
| Liquid ratio | −0.0424 | −0.0466 | −0.0430 | −0.0386 | −0.0422 | −0.0468 | −0.107 | −0.112 |
|  | (−0.10) | (−0.11) | (−0.10) | (−0.09) | (−0.10) | (−0.11) | (−0.27) | (−0.28) |
| *Crisis + Crisis x Public = 0* |  | *−0.026* | *−0.027* | *−0.026* |  | *0.008* | *0.001* | *0.001* |
| *Post-Crisis + Post-crisis x Public = 0* |  |  |  |  |  | *0.118** | *0.117** | *0.120** |
| Obs. | 1237 | 1237 | 1237 | 1237 | 1237 | 1237 | 1237 | 1237 |
| # banks | 107 | 107 | 107 | 107 | 107 | 107 | 107 | 107 |
| Bank FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 |

The dependent variable is credit growth, which is the growth rate of loans in real franc CFA. We regress credit growth on crisis and post-crisis dummies, bank ownership and bank-level variables in the period 2000–2019. Crisis is a dummy equal to 1 if country c experienced a crisis at year t (see Table A2 for the list of crises). Post-crisis dummy equals 1 in the three years after a crisis. Public is a dummy equal to 1 if the bank is a domestic state-owned bank (majority holder is the State). Foreign is a dummy equal to 1 if the bank is foreign owned. Foreign (Africa) is a dummy equal to 1 if the major shareholder is a foreigner from Africa and Foreign (no Africa) equal to 1 if the major shareholder is a foreigner from a non-African country. The omitted category is privately owned banks. Ownership dummies are interacted with crisis dummies and post-crisis dummies. Bank-level controls are the log of total assets, the ratio of equity to total assets, the ratio of loans to assets, the ratio of deposits to total liabilities and the ratio of liquid assets over total assets. All control variables entered with one lag. Models are estimated using a two-way fixed effect estimator (bank and year). The p-values for clustered standard errors at the bank level are given in parentheses, and ***, **, * correspond to the 1%, 5%, and 10% levels of significance, respectively.

More specifically, loan growth by State-owned banks is reduced by 2.5% but it is insignificant. In columns (3) and (4), we also add an interaction with foreign banks. Foreign-owned banks are less sensitive to crisis than privately-domestic owned banks. Interestingly, foreign banks from other continents than Africa are more likely to continue to lend than pan-African banks.[12]

We then extend the analysis to consider the post-crisis periods in the last four columns of Table 5 by running Eq. (2). As previously, we first consider crisis and post-crisis dummies without interactions (column 5). We then include interactions with the State-owned dummy only (column (6)) and finally run the full model in columns (7) and (8). We document that lending growth was largely affected by a crisis but less affected afterwards. Even if credit is reduced in the three years after a crisis, the economic impact (−4%) and statistical significance are lower than that associated with the crisis dummy (−15%).

In columns (6) to (8), we examine how ownership shapes bank lending during and after a crisis. We first confirm our previous

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[12] Several explanations can justify this result. First, foreign banks from other continents often belongs to larger groups, which are more likely to support them during a downturn. Another explanation may be due to customers financed by the different banks. We might expect that international companies often financed by foreign banks from other continents are less affected by internal events. Unfortunately, our data do not allow us to investigate these explanations (which are outside of our purpose).

findings regarding the impact of State ownership during a crisis. Public banks not only continue to lend at the same rate during a crisis as previously documented ($\beta_2 > 0$; $\beta_1 + \beta_2 = 0$); but they tend to increase their support after a shock ($\delta_2 > 0$ and $\delta_1 + \delta_2 > 0$), contrary to private banks that reduce their lending ($\delta_1 \leq 0$). Loan growth provided by State-owned banks increases by 12% after a crisis.

As previously, we also examine how foreign-owned banks behave in the wake of a crisis. We found similar findings than for State-owned banks. Foreign-owned banks not only support activity during a downturn but also afterwards. We also confirm that foreign banks from non-African countries are more likely to support activity during and after a crisis.[13] This finding is not in line with results provided by Zins and Weill (2018), who document that foreign banks from Africa are less procyclical. However, their paper focuses on both sides of a business cycle and does not dedicate special attention to downturns.

### 4.1.2. The degree of state ownership

We then consider how the degree of State involvement in a bank affects its behavior during a downturn. To do so, we classify banks with public participation into three groups. We first break down the group of State-owned banks (i.e., banks where the State is the majority shareholder) into two subgroups. The first subgroup includes banks where the State owns more than 50% of the total equity (absolute majority). The second group is comprised of public banks where the State is the main shareholder but holds less than 50% of the capital (not absolute majority). Finally, we consider a third group, in which the public authority is a minority shareholder. There are 30 private banks in our sample in which the State holds capital without being the main shareholder.[14]

Based on the breakdown presented above, we rerun our baseline model displayed in Eq. (2)[15] but include a different definition of "public banks". Results are presented in Table 6. Column (1) first considers a model that includes all banks in which the State owns a share of capital (irrespective of majority or minority shareholder status). Results indicate that when we encapsulate public minority banks as public banks, banks with the State as a shareholder no longer continue to smooth negative shocks during and after a shock.

In column (2) of Table 6, we document that this finding is due to the behavior of banks in which the State is a minority investor. The presence of the government as an equity holder is not enough to shape the lending activity of the private banks.

In the third column, we focus only on State-owned banks, defined as banks where the State is the majority shareholder as in our baseline analysis. However, we break them down into banks in which the State owns more than 50% of capital and those of which the State holds less than 50% of the share. In the latter group, the State is more likely to bargain with other shareholders because it does not hold the absolute majority. Interestingly, the results, displayed in column (3) of Table 6 indicate that there is no statistical difference between the two groups of State-owned banks.

Finally, column (4) considers a complete model with the three categories and confirm previous findings, notably the absence of an effect on private banks with minor State participation and the lack of difference between State-owned banks with and without an absolute majority.

To sum up, Table 6 documents that the State is able to shape a bank's lending behavior during and after a crisis if and only if the State is the major holder of capital. However, having an absolute majority (more than 50% of shares) does not play a role.

### 4.1.3. Robustness checks

We run several robustness checks, displayed in the Appendix, to confirm our main findings. First, we use a model considering each post-crisis year separately rather than a dummy for the three years. Our main findings, displayed in Table A4, are not altered.

Second, the empirical framework employed in this paper can be seen as a difference-in-difference approach, where crisis defines pre- and post-treatment periods and public ownership is the treatment.[16] One might wonder if public and private banks differ in their lending, not only after a crisis but also before. We therefore test the parallel trends assumption. To do so, we consider a model with pre-crisis dummies up to 5 years before a crisis. We consider two specifications, one excluding crisis and post crisis dummies (columns (1) and (2)) and the other including both dummies (columns (3) and (4)). Results, displayed in Table A5, do not show a statistical difference in loan growth between public and private banks prior to a crisis, irrespective of the specification or year before the crisis considered. This test reinforces our confidence in the validity of the empirical approach.

Third, we address the definition of crisis retained in our paper. To detect a crisis, we adopt a trackable approach. To be certain that our findings are not driven by the definition of crises, we propose three alternative definitions (described in Section 2.5). In column (1) of Table A6, we consider a parametric approach to extract cyclical component of growth. In column (2), we consider a crisis if GDP growth was negative. In the third column of the table, we apply the baseline approach but we rely on GDP per capita growth instead of GDP growth. Results are unaltered for the two first alternative definitions of crises. When we consider GDP per capita growth, we document that lending rates are not affected during a crisis. However, this approach includes more events (17 crises versus 7 in the

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[13] In details, we document that foreign banks from Africa reduce their lending during a shock, while foreign banks from other continents do not change their lending rate. Both types of banks maintain their loans after a shock.

[14] Among these 30 banks, the share of capital owned by the State ranges from 1% to 37% (median = 10%).

[15] All models employed in the following also include interactions with Foreign (Africa) and Foreign (No Africa) dummies (not reported to save space). But we refer to major changes regarding these variables if required.

[16] We thank the Associate Editor for inviting us to read our empirical framework in this way. In line with this point and suggestion made by the AE, we also applied a matching analysis as treatment (be a public bank) is not exogenous. However, matching is rather complex in our framework as we have a limited number of banks per country. Only a handful of private banks (control units) can be considered as matched control and the risk is that results will be driven by these banks. We nonetheless confirmed our main finding after applying a matching procedure (despite a strong reduction of sample size from 112 banks to 42 and even 19 banks when we restricted the caliper).

**Table 6**

The role of public participation.

| | (1) | | (2) | | (3) | | (4) | |
|---|---|---|---|---|---|---|---|---|
| | Coef | St. Dev. | Coef | St. Dev. | Coef | St. Dev. | Coef | St. Dev. |
| Crisis | −0.281* | (0.164) | −0.675*** | (0.174) | −0.696*** | (0.162) | −0.675*** | (0.174) |
| Crisis x Public (maj + min) | 0.132 | (0.135) | | | | | | |
| Crisis x Public (maj) | | | 0.675*** | (0.203) | | | | |
| Crisis x Public (min) | | | −0.102 | (0.104) | | | −0.102 | (0.104) |
| Crisis x Public (maj > 50%) | | | | | 0.672*** | (0.234) | 0.650*** | (0.244) |
| Crisis x Public (maj < 50%) | | | | | 0.730*** | (0.194) | 0.708*** | (0.204) |
| | | | | | | | | |
| Post-crisis | −0.273 | (0.184) | −0.556** | (0.246) | −0.555** | (0.242) | −0.556** | (0.246) |
| Post-crisis x Public (maj + min) | 0.245 | (0.152) | | | | | | |
| Post-crisis x Public (maj) | | | 0.676*** | (0.258) | | | | |
| Post-crisis x Public (min) | | | 0.005 | (0.129) | | | 0.005 | (0.129) |
| Post-crisis x Public (maj > 50%) | | | | | 0.669** | (0.264) | 0.670** | (0.266) |
| Post-crisis x Public (maj < 50%) | | | | | 0.682** | (0.278) | −0.683** | (0.281) |
| | | | | | | | | |
| Obs | 1237 | | 1237 | | 1237 | | 1237 | |
| # banks | 107 | | 107 | | 107 | | 107 | |
| Bank FE | Yes | | Yes | | Yes | | Yes | |
| Year FE | Yes | | Yes | | Yes | | Yes | |
| CV | Yes | | Yes | | Yes | | Yes | |
| $R^2$ | 0,32 | | 0,32 | | 0,32 | | 0,32 | |

The dependent variable is credit growth, which is the growth rate of loans in real franc CFA. We regress credit growth on crisis and post-crisis dummies, bank ownership and bank-level variables in the period 2000–2019. Crisis is a dummy equal to 1 if country c experienced a crisis at year t (see Table A2 for the list of crises). Post-crisis dummies refer to the year after the crisis event. Public (maj + min) is a dummy equal to 1 if the State is an investor is the bank, Public (min) is equal to 1 if the State is a minority shareholder, Public (maj) if the State is a majority shareholder, Public (maj > 50%) if the State owns more than 50% of equity and Public (maj < 50%) if the State is a majority shareholder but holds less than 50% of capital. The omitted category is privately owned banks. Public dummies are interacted with crisis dummies and post-crisis dummies. Bank-level controls (unreported) are the log of total assets, the ratio of equity to total assets, the ratio of loans to assets, the ratio of deposits to total liabilities and the ratio of liquid assets over total assets. All control variables entered with one lag. Models also include interactions between foreign banks (separating from Africa and frm elsewhere) and crisis and post-crisis dummies. Models are estimated using a two-way fixed effect estimator (bank and year). The p-values for clustered standard errors at the bank level are given in parentheses, and ***, **, * correspond to the 1%, 5%, and 10% levels of significance, respectively.

baseline). In particular, we have nine events for which GDP growth is positive, which raises doubts about the real importance of these shocks.

Fourth, we directly include GDP growth as a control variable in column (4) of Table A6. We then consider the 2008–9 global financial crisis as another major shock. Existing works based on event study rely on this event that affected banks around the world. Crises identified by our approach never includes the 2008–09 GFC. However, one might expect that public banks behave differently during the 2008–9 global financial crisis. None of these tests challenges our main findings.

In column (6) of Table A5, we focus on five State-owned banks that have changed status over time (see Table 2). In our baseline analysis, bank fixed effects allow us to control for unobserved time-invariant bank characteristics, including state ownership status. However, this assumption is valid only for State-owned banks that remained public over the whole period. While 19 State-owned banks did not change their ownership structure, five remaining banks changes their status from public to private banks or vice versa. More specifically, the coefficient associated with interactions can be driven by the simple fact that these five banks are public. We rerun the model excluding these five banks without it affecting our results.

In the final two columns of Table A6, we extend the definition of loan growth. We first consider a larger definition of a loan by combining interbank loans and customer loans. Results decrease when we incorporate interbank lending to compute loan growth, as indicated in column (7). In the final column of Table A6, we apply a falsification test by focusing exclusively on interbank lending. We see that public banks do not lend more to other financial institutions during or after a crisis. This result points out that the observed relationship was only valid for providing credit to customers (firms and households).

### 4.2. Channels

To summarize, econometric results illustrate that State-owned banks continue to lend in the wave of a shock, contrary to private banks. Several arguments can be advanced to explain the ability of public banks to lend in times of crisis. First, State-owned banks have a mandate (implicit or explicit) to stabilize economic activity (Brei and Schclarek, 2015; Behr et al., 2017). As such, they will consciously increase their credit lines in times of recession even if this implies taking on greater risk. Second, the model of State-owned banks is more conducive to maintaining their business in times of crisis. On the supply side, public bank resources are more stable because they rely primarily on their own resources or on debt raised in the financial markets (de Luna-Martinez and Vicente, 2012) and because they benefit from a state guarantee, which reassures their creditors and depositors (Brei and Schclarek, 2015). On the demand side, the loan portfolio of public banks is an additional source of stability. Their loans are primarily oriented towards long-term

corporate loans (de Luna-Martinez and Vicente, 2012). While household demand for credit shrinks in times of crisis, firms most often need access to additional funds in difficult times when other sources of financing dry up. Finally, according to the political view, State-owned bank lending decisions are politically motivated to favor re-election of an incumbent (Dinç, 2005) or to achieve rent extraction by connected firms (Khwaja and Mian, 2005). As a result, public bank lending is less sensitive to macroeconomic evolution than to political timelines.

In the following section, we provide tests for two hypotheses: the stability of resources and the political view. Indeed, due to a lack of information, we cannot investigate hypotheses based on mandates and loan portfolio composition (demand channel).[17]

### 4.2.1. Stability of resources

We consider the hypothesis of stable resources by testing whether the sensitivity of funding during a crisis differs between public and private banks. According to this hypothesis, State-owned banks benefit from stable resources because they rely primarily on their own resources or on long-term debt raised on the financial markets (de Luna-Martinez and Vicente, 2012) and they usually benefit from a state guarantee, which avoids bank runs (Brei and Schclarek, 2015).

We first examine whether public bank resources are more stable than those of private banks in times of crisis. In doing so, we apply regressions analogous to column (8) in Table 5, but we replace credit growth with the growth of total liabilities. Results, displayed in column (1) of Table 7, indicate that private banks suffer from a contraction of funding during and after a crisis. In contrast, public bank resources are insensitive to business cycles.

We then examine which type of State bank funding retracts relatively less than that of private banks during a downswing in the business cycle. We distinguish between deposits (column 2) and non-deposit liabilities (column 3), which shed light on two possible explanations for the stability of public bank resources. Results in column (2) of Table 7 indicate that the difference between private and public banks is driven by an evolution of deposits in the wave of a crisis. State-owned banks benefit from stable resources because depositors are less likely to withdraw their deposits. In the short run, we do not see a clear difference in terms of other liabilities, as indicated in column (3) of Table 7. We support the previous finding in columns (4) to (6) by focusing on the evolution of the deposits-to-assets ratio. In column (4), we compute the annual variation of the ratio. In column (5), we adopt a measure of volatility of deposits-to-assets ratio by using the standard deviation for a window of 3 years and for 5 years in the following column. We document that volatility of deposits to assets is lower for State-owned banks during crisis and post-crisis years.

In the last column of Table 7, we confirm the importance of the resource stability channel by scrutinizing the transformation ratio in times of crisis. We compute the transformation ratio as the ratio of loans to deposits. If results are driven by a change in lending behavior, we should observe a contraction of the transformation ratio during a crisis. In other words, for a given level of deposits, a bank will contract its lending. However, if the explanation is based on resource availability, the contraction in lending can be explained by the contraction in deposits, and the ratio of loans to deposits remains unchanged. Results displayed in the last column of Table 7 are in line with the latter explanation and the resource stability channel.

### 4.2.2. Political view

We then study the impact of political cycles. Lending behavior can be driven by the electoral calendar, as stated by the *political view*. According to this view, lending by State-owned banks increases during electoral periods (Dinç, 2005). The risk for our analysis was that macroeconomic cycles could be (positively or negatively) related to the political calendar. On the positive side, incumbents may stimulate economic activity – notably by promoting loan approval by State-owned banks – to favor their re-election. On the other side, elections can trigger conflicts and therefore downturns, as illustrated by events in Côte d'Ivoire in 2000–03 and 2011. To sum up, private banks can be reluctant to lend during elections, while public banks continue to lend and even increase their lending activity. If the election calendar is related to macroeconomic conditions, we can simply capture the relationship between public bank lending and election cycles rather than public banks' response to macroeconomic events.

To test this hypothesis, we extend the model described in Eq. (2) by adding interactions between election year dummies and State-owned bank dummies. We identify the election years in the eight countries. Not all elections are of the same importance; in the countries under investigation, presidential elections play a major role because the political regimes are presidential regimes or because the president dominates political life (as in Togo). We considered the following 34 presidential elections: Benin (2001, 2006, 2011, 2016), Burkina Faso (2005, 2010, 2015, 2020), Côte d'Ivoire (2000, 2010, 2015, 2020), Guinea Bissau (2005, 2009, 2012, 2014, 2019), Mali (2002, 2007, 2013, 2018), Niger (2004, 2011, 2016, 2020), Senegal (2000, 2007, 2012, 2019) and Togo (2005, 2010, 2015, 2020). For each election, we create a dummy for election year, a dummy for the pre-election year, and a dummy for the post-election year.

If the political view is confirmed, we should observe that lending by State-owned banks increased in election and pre-election years. In addition, if our main results are explained by the omission of the political view, we could see a reduction in the coefficients

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[17] Papers often ignore the mandate channel due to a lack of information. There are two exceptions. Behr et al. (2017) directly tested this channel and showed that banks with a public mandate are less procyclical than banks without such a mandate. In a recent work, Brei and Schclarek (2018) studied the differences between "commercial" public banks and public development banks. The latter have an explicit developmental mandate. In the case of Latin America, they showed that the two types of public banks act countercyclically without revealing any real difference between the two types of public banks. In the remainder of studies, the mandate hypothesis is often seen as an explanation when other arguments are not sufficient to explain the observed facts. As in previous papers, we lack information on the mandate.Testing the demand-side hypothesis implies getting access to the investment portfolio, which was missing from our dataset.

**Table 7**
Stability of resources.

|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Crisis | −0.377*** | −0.590*** | −0.366* | −0.00387 | −0.0176 | 0.0166 | −0.127* |
|  | (−3.39) | (−3.03) | (−1.69) | (−0.13) | (−1.15) | (1.01) | (−1.77) |
| Crisis x Public | 0.423*** | 0.496** | 0.365 | −0.0439 | −0.0526** | −0.0891** | 0.0857 |
|  | (3.71) | (2.45) | (0.34) | (−0.98) | (−2.12) | (−2.07) | (1.03) |
| Post-crisis | −0.256** | −0.505** | 0.342 | −0.0161 | 0.0237 | 0.0195 | −0.101 |
|  | (−2.15) | (−2.12) | (0.78) | (−0.59) | (1.18) | (0.71) | (−1.52) |
| Post-crisis x Public | 0.344*** | 0.584** | −0.0344 | −0.00359 | −0.0706** | −0.0947** | 0.178 |
|  | (2.75) | (2.18) | (−0.10) | (−0.09) | (−2.24) | (−2.15) | (1.41) |
| Obs | 1237 | 1237 | 1237 | 1237 | 1216 | 1153 | 1237 |
| # banks | 107 | 107 | 107 | 107 | 107 | 107 | 107 |
| Bank FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| CV | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | 0.18 | 0.17 | 0.00 | 0.28 | 0.09 | 0.12 | 0.16 |

The dependent variable is the growth of liabilities in column (1), of deposits in column (2), of non-deposit liabilities in column (3), the variation of ratio of deposits to total assets in column (4), the standard deviation of the same ratio over a period of 3-year and 5-year, respectively in columns (5) and (6) and of the transformation ratio in column (7). We regress dependent variables on crisis and post-crisis dummies, bank ownership and bank-level variables in the period 2000–2019. Crisis is a dummy equal to 1 if GDP per capita growth is below the country's 1995–2020 average minus one standard error. Post-crisis dummies refer to the year after the crisis event. Public is a dummy equal to 1 if the bank is a domestic state-owned bank (majority holder is the State). The omitted category is privately owned banks. Public dummy is interacted with crisis dummies and post-crisis dummies. Year and bank dummies are incorporated in all specifications. Bank-level controls (unreported) are the log of total assets, the ratio of equity to total assets, the ratio of loans to assets, the ratio of deposits to total liabilities and the ratio of liquid assets over total assets. All control variables entered with one lag. Models also include interaction between foreign banks and crisis and post-crisis years. Models are estimated using an OLS estimator. The *p*-values for clustered standard errors at the bank level are given in parentheses, and ***, **, * correspond to the 1%, 5%, and 10% levels of significance, respectively.

associated with the interaction between the crisis and public dummies.

Results, presented in Table 8, indicate that the inclusion of dummies for electoral cycles do not influence our main results. Public banks did not react to electoral cycles. This result contradicts some evidence that suggests that State-owned banks are politically captured, especially in countries with weak institution levels (Shleifer and Vishny, 1994; La Porta et al., 2002; Dinç, 2005). Our finding proves that the countercyclicality was not due to the political view hypothesis.

To summarize, regressions presented in this subsection document that State-owned banks act countercyclically because their

**Table 8**
Testing the political view.

|  | (1) | | (2) | |
|---|---|---|---|---|
|  | Coef | Std. Dev. | Coef | Std. Dev. |
| Crisis | −0.760*** | (−4.19) | −0.658*** | (−3.27) |
| Crisis x Public | 0.764*** | (3.72) | 0.655*** | (2.79) |
| Post-crisis | −0.617** | (−2.41) | −0.693** | (−2.37) |
| Post-crisis x Public | 0.731*** | (2.72) | 0.828*** | (2.75) |
| Election | −0.322* | (−1.84) | −0.267 | (−1.40) |
| Election x Public | 0.259 | (1.42) | 0.237 | (1.17) |
| Election (t-1) |  |  | 0.461 | (1.56) |
| Election (t-1) x Public |  |  | −0.415 | (−1.39) |
| Election (t + 1) |  |  | −0.183 | (−1.48) |
| Election (t + 1) x Public |  |  | 0.214 | (1.28) |
| Obs | 1237 |  | 1237 |  |
| # banks | 107 |  | 107 |  |
| Bank FE | Yes |  | Yes |  |
| Year FE | Yes |  | Yes |  |
| CV | Yes |  | Yes |  |
| $R^2$ | 0.32 |  | 0.34 |  |

The dependent variable is credit growth. We regress dependent variables on crisis and post-crisis dummies, election dummies, bank ownership and bank-level variables in the period 2000–2019. Crisis is a dummy equal to 1 if country c experienced a crisis at year t (see Table A2 for the list of crises). Post-crisis dummies refer to the year after the crisis event. Public is a dummy equal to 1 if the bank is a domestic state-owned bank (majority holder is the State). The omitted category is privately owned banks. Public dummy is interacted with crisis dummies and post-crisis dummies. Year and bank dummies are incorporated in all specifications. Bank-level controls (unreported) are the log of total assets, the ratio of equity to total assets, the ratio of loans to assets, the ratio of deposits to total liabilities and the ratio of liquid assets over total assets. All control variables enter with one lag. Models also include interaction between foreign banks and crisis and post-crisis years. Models are estimated using an OLS estimator. The *p*-values for clustered standard errors at the bank level are given in parentheses, and ***, **, * correspond to the 1%, 5%, and 10% levels of significance, respectively.

resources, especially deposits, are more stable than those of private banks. Public banks benefit from implicit insurance coverage. Our results do not offer support for the political view. Unfortunately, we cannot test two other possible channels: mandate and loan portfolio composition. We cannot reject the hypothesis that, in addition to stable resources, public banks benefit from an implicit or explicit mandate to support economic activity during downturns. However, we do not believe that the positive role of State-owned banks can be thoroughly explained by the portfolio composition because almost all loans in the WAEMU countries are oriented towards firms rather than households (Léon, 2018).

### 4.3. Impact on performance and risk

We conclude the analysis by evaluating the possible side-effects of the countercyclicality of State-owned banks on performance and portfolio quality. While a substantial number of papers document that government banks stabilize economies during downturns, increased lending does not necessarily benefit the economy, especially in countries with low levels of institutional development (Bertray et al., 2015; Coleman and Feler, 2015; Chen et al., 2016). State-owned banks can allocate their funds to connected firms (Khwaja and Mian, 2005; Sapienza, 2004), and this support can increase during downturns due to limited scrutiny of bank lending strategies (Coleman and Feler, 2015). In addition, during a crisis, public support – including public bank lending – can help to maintain zombie firms above the waterline (Zoller-Rydzek and Keller, 2020; Huneeus et al., 2022). However, these firms will fail to repay their loans in the long run. As a result, the countercyclicality of public banks can have an adverse effect by inducing a degradation of the balance sheets of State-owned banks.

In the final part of the article, we scrutinize the impact of crisis and post-crisis episodes on the health of public banks. To do so, we investigate the evolution of the financial performance and risk profile of public banks in times of crisis. We replicate the model run in the last column of Table 5 but we change the dependent variables by considering proxies of performance and risk.

We consider two indicators of financial performance, namely return on assets and return on equity. If State-owned banks misallocate their funds during downturns, we should observe a degradation of performance (lower ROA and ROE). Results, presented in Table 9, do not lend support to this hypothesis. State-owned banks outperform private banks both during and after a crisis, as indicated by coefficients associated with interactions in columns (1) and (2) of Table 9. In any case, public banks do not underperform in times of crisis.

We then test the deterioration of portfolio quality by considering two proxies of risk profile. A common indicator is non-performing loans (NPLs). Unfortunately, we could not get access to NPLs. We therefore exploit information on the loan loss provisions over loans. In the presence of deterioration in the loan portfolio, banks will increase their risk provisions. We also compute a measure of bank soundness by computing the Z-score, which measures the solvency of a bank and is the sum of the average ROA and average equity to assets divided by the standard deviation of the ROA. A decrease in the Z-score indicates a deterioration in bank soundness. We see a degradation in bank portfolio quality proxied by the provisions for losses (column (3)). However, in this aspect, State-owned banks do not differ from private domestic banks. We also document a reduction in bank soundness, proxied by the Z-score, during and after a shock, even if empirical results are not statistically significant. Once again, differences between public and private banks are not

**Table 9**
Impact on performance and risk profile.

|  | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Crisis | −0.00751 | −0.154 | 0.0115* | −25.34 |
|  | (−0.75) | (−0.92) | (1.74) | (−1.26) |
| Crisis x Public | 0.0477** | 0.428* | 0.0101 | 22.23 |
|  | (1.98) | (1.74) | (0.75) | (0.97) |
| Post-crisis | 0.00263 | −0.0376 | −0.00218 | −22.71 |
|  | (0.18) | (−0.16) | (−0.59) | (−0.88) |
| Post-crisis x Public | 0.0267 | 0.214 | 0.00783 | 24.67 |
|  | (1.18) | (0.89) | (0.90) | (1.10) |
| Obs | 1137 | 1133 | 1230 | 1003 |
| # banks | 107 | 106 | 107 | 107 |
| Bank FE | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes |
| CV | Yes | Yes | Yes | Yes |
| $R^2$ | 0.039 | 0.039 | 0.151 | 0.001 |

The dependent variable is the return on assets in column (1), return on equity in column (2), loan loss provisions in column (3) and the Z-score in column (4). We regress dependent variables on crisis and post-crisis dummies, bank ownership and bank-level variables in the period 2000–2019. Crisis is a dummy equal to 1 if country c experienced a crisis at year t (see Table A2 for the list of crises). Post-crisis dummies refer to the year after the crisis event. Public is a dummy equal to 1 if the bank is a domestic state-owned bank (majority holder is the State). The omitted category is privately owned banks. Public dummy is interacted with crisis dummies and post-crisis dummies. Year and bank dummies are incorporated in all specifications. Bank-level controls (unreported) are the log of total assets, the ratio of equity to total assets, the ratio of loans to assets, the ratio of deposits to total liabilities and the ratio of liquid assets over total assets. All control variables enter with one lag. Models also include interaction between foreign banks and crisis and post-crisis years. Models are estimated using an OLS estimator. The p-values for clustered standard errors at the bank level are given in parentheses, and ***, **, * correspond to the 1%, 5%, and 10% levels of significance, respectively.

statistically significant.

To summarize, econometric results displayed in Table 9 do not support the view that the countercyclical activity of public banks deteriorate their performance or bank health.

## 5. Conclusion

The COVID-19 crisis has reignited the debate about the role of the State and notably of public banks in times of crisis. Despite the limited impact of the current pandemic, African countries are among the most unstable economies due to their high exposure to external shocks and low capacity to mitigate them. African countries have few tools at their disposal because of the difficulty of mobilizing fiscal resources. State-owned banks are nevertheless a useful instrument due to their ability to raise their own resources and their importance in banking financial markets.

Despite a rich literature on the countercyclicality of public banks in the developing world, we know little about the role of State-owned banks in Africa in times of crisis. This paper fills this gap by exploring data on the universe of banks operating in eight West African countries (Benin, Burkina-Faso, Côte d'Ivoire, Guinea Bissau, Mali, Niger, Senegal and Togo) from 2000 to 2019. Our final sample covers 112 banks, including 24 public banks, defined as banks where the State is the main shareholder. We test whether State-owned banks maintain their lending both during and three years after a crisis. We define a crisis as a sharp contraction of growth. In our baseline analysis, we identify 7 crisis episodes.

The baseline analysis provides four main findings. First, lending decreases not only during a crisis but also afterwards. Second, in the year of a crisis, public banks continue to lend at the same rate than during normal times, while private-owned firms contract their lending. Third, State-owned banks not only maintain their lending in the wave of a crisis but also afterwards. Finally, we show that (private) banks where the State is a minor shareholder behave like other private banks, indicating that the State must hold the majority of a bank's shares in order to shape its behavior during a crisis.

We also attempt to understand what explains the positive impact of State-owned banks. Public banks act countercyclically because their resources, especially deposits, remain stable over the business cycle. This finding is in line with the argument that public banks benefit from an implicit insurance (Brei and Schclarek, 2015). Our data do not allow us to reject the hypothesis that public banks, in addition to stable resources, benefit from a mandate to support economic activity during downturns. However, we do not believe that our results can be explained by a difference in portfolio composition between public and private banks insofar as the majority of loans in the WAEMU are allocated to firms (Léon, 2018) and we rejected the hypothesis that stability is due to the political orientation of the loan allocation of State-owned banks.

In the final part of the article, we scrutinize whether countercyclicality comes with costs. To do so, we study whether the health of public banks deteriorated more than that of their counterparts both during and after a crisis. Contrary to previous works (Bertray et al., 2015; Coleman and Feler, 2015; Chen et al., 2016), we do not observe that the countercyclicality of public banks is detrimental to their performance and stability.

A limitation of this study is its geographical scope as we focus on banks operating in eight West African countries. We cannot directly infer from our results evidence for other African countries. In addition, we focus on all public banks. Recent works have highlighted that commercial public banks and development publics banks can behave (slightly) differently (Brei and Schclarek, 2018).

The results of this work, together with those provided by other research, highlight a clear role for public banks following a crisis. This was confirmed during the COVID-19 pandemic. Policymakers should insure that public banks will be able to properly react during a crisis, notably by providing them stable resources and favoring their ability to store capital during normal times. If public banks, and the State in general, are able to react to crises, the question of how to best anticipate and mitigate future crises arises. Indeed, it is now recognized that many countries, particularly in Africa, are extremely vulnerable to and suffering from civil conflict, ongoing extreme weather events, and other shocks and will continue to suffer more and more intensely from the ongoing climate crisis. Therefore, it is critical to explore the role that public banks may play in coping with future catastrophic shocks.

**Author's statements**

All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated sufficiently in the work to take public responsibility for the content, including participation in the concept, design, analysis, writing, or revision of the manuscript. Furthermore, each author certifies that this material or similar material has not been and will not be submitted to or published in any other publication before its appearance in the *Emerging Markets Review*.

The contribution of all authors is equal.
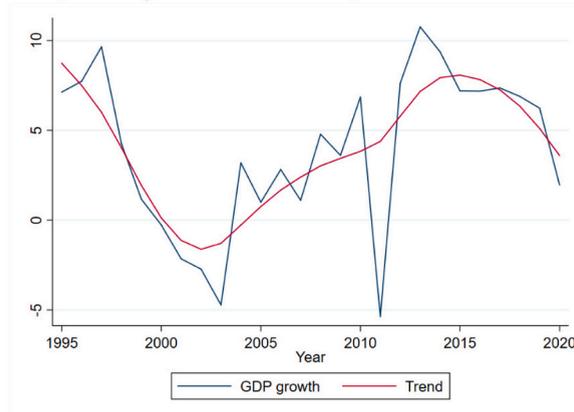
**Data availability**

Data and codes will be freely available on my website after publication

**Acknowledgements**

**Appendix A. Additional Tables and Figures**

### Panel A) GDP growth and trend (Hodrick-Prescott filter)

### Panel B) Cyclical component and crisis identification
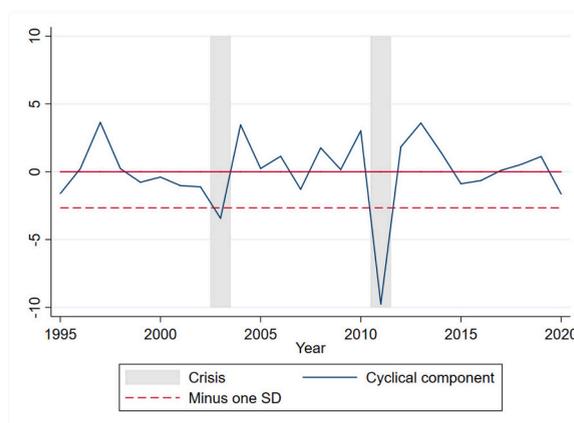
**Fig. A1.** Identification of crisis, Example of Côte d'Ivoire.

Panel A Figure displays GDP growth in Côte d'Ivoire from 1995 to 2020 in blue. Red line plots the trend estimated by Hodrick-Prescott filter (with a smoothing parameter equal to 6.25).

Panel B Figure displays the cyclical component of GDP growth in Côte d'Ivoire from 1995 to 2020. Red-dashed line indicates the threshold defined as one-standard deviation of cyclical component. Grey areas report periods of crises defined as years where cyclical component of growth is below one standard deviation of the distribution of cyclical component.

## Panel A) GDP growth and trend (Hodrick-Prescott filter)
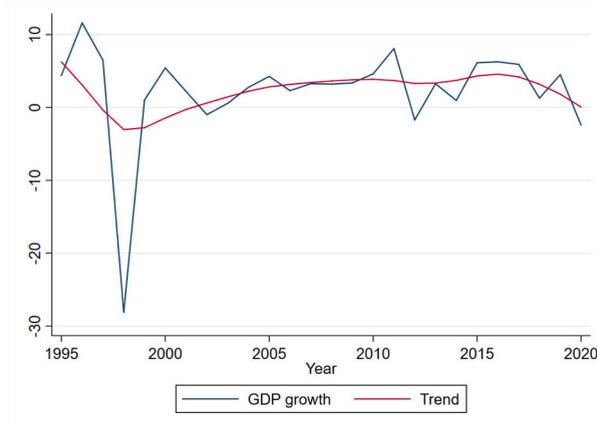


## Panel B) Cyclical component and crisis identification



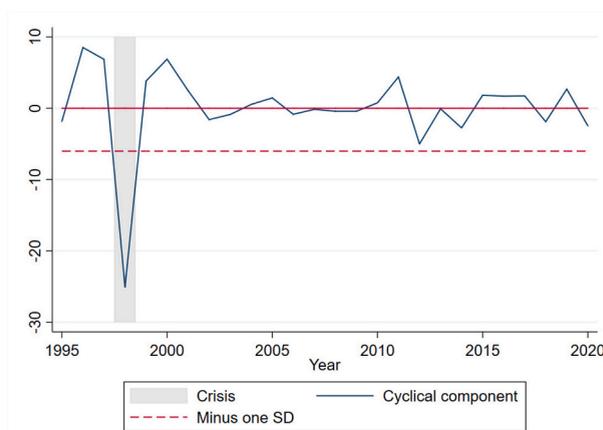**Fig. A2.** Identification of crisis, Example of Guinea-Bissau.

Panel A Figure displays GDP growth in Guinea-Bissau from 1995 to 2020 in blue. Red line plots the trend estimated by Hodrick-Prescott filter (with a smoothing parameter equal to 6.25).

Panel B Figure displays the cyclical component of GDP growth in Guinea-Bissau from 1995 to 2020. Red-dashed line indicates the threshold defined as one-standard deviation of cyclical component. Grey area reports the period of crises defined as years where cyclical component of growth is below one standard deviation of the distribution of cyclical component.

**Table A1**
A synthesis of literature on the cyclicality of public banks in developing countries.

| Panel A) Methodology | | | |
|---|---|---|---|
| Authors | Public ownership | Business cycle | Econometric model |
| Micco and Panizza (2006) | > 50% | GDP growth | FE-Static |
| Brei and Schclarek (2013) | > 50% | Banking crisis | Dynamic panel |
| Cull and Martinez Peria (2013) | > 50% | Dummy (2008–09) | FE-Static |
| Bertray et al. (2015) | Majority owner | Per capita income growth | Dynamic panel |
| Chen et al. (2016) | > 20% | Dummy (2009) | Pre-post model |
| Brei and Schclarek (2018) | > 50% (NDBs: no deposit) | Banking crisis | Dynamic panel |
| Zins and Weill (2018) | Majority owner | GDP per capita growth | Dynamic panel |
| | | | |
| Panel B) Data and sample | | | |
| Authors | Decription | Geography (SS Africa) | % of PBs |
| Micco and Panizza (2006) | 25,323 obs (1995–2002) | Unknown | Unknown |

**Table A1** (*continued*)

Panel A) Methodology

| Authors | Public ownership | Business cycle | Econometric model |
|---|---|---|---|
| Brei and Schclarek (2013) | 764 banks from 50 countries (1994–2009) | Latin America and Europe | 8% |
| Cull and Martinez Peria (2013) | 403 banks from 14 countries (2004–2009) | Latin America and Europe | 8% |
| Bertray et al. (2015) | 1633 banks from 111 countries (1999–2010) | International (69 banks from 16 SSA countries) | 17% |
| Chen et al. (2016) | 2547 banks from 56 countries (2004–2010) | International (9 banks from 2 African countries) | 4% |
| Brei and Schclarek (2018) | 336 banks from 31 countries (1995–2014) | Latin America | 14% |
| Zins and Weill (2018) | 190 banks from 20 countries (2002–2015) | North Africa (59 banks) and SSA (131) | 12% |

Panel C: Main results

| Authors | (Impact of public banks) |
|---|---|
| Micco and Panizza (2006) | Procyclical (but less than private); Stronger effect in developing countries |
| Brei and Schclarek (2013) | Counter-cyclical |
| Cull and Martinez Peria (2013) | Counter-cyclical only in Latin America but not in Eastern Europe |
| Bertray et al. (2015) | Procyclical (but less than private); Stronger in high-income countries and countries with good governance |
| Chen et al. (2016) | Procyclical (but less than private); In countries with high corruption, there is a degradation of portfolio quality. |
| Brei and Schclarek (2018) | Counter-cyclical |
| Zins and Weill (2018) | No lending difference between domestic private banks and State-owned banks (procyclical) |

**Table A2**
Identification of crises.

| Country | Year | Baseline | Robust1 | Robust2 | Robust3 | Explanation(s) |
|---|---|---|---|---|---|---|
| Côte d'Ivoire | 2003 | X | X | X | X | Civil conflict |
| Côte d'Ivoire | 2011 | X | X | X | X | Civil conflict |
| Guinea Bissau | 1998 | X | X | X | X | Civil conflict |
| Mali | 2000 | X | X | X | X | Low price of cotton |
| Mali | 2012 | X | X | X | X | Civil conflict |
| Niger | 1999–2000 | X | X | X | X | Civil conflict |
| Togo | 2005 | X | X | X | X | Low price of cotton and phospate + electoral tension |
| Côte d'Ivoire | 2001–02 | | X | X | | Civil conflict |
| Togo | 2000 | | X | X | X | Low price of cotton and phospate |
| Togo | 2004 | | X | X | | Low price of cotton and phospate |
| Guinea Bissau | 2002 | | | X | | Net foreign outflows + low price of cashew nuts |
| Guinea Bissau | 2012 | | | X | | Civil conflict + low price of cashew nuts |
| Togo | 2007 | | | X | X | International inflation of oil and food products |
| Benin | 2005 | | | | X | Low agricultural production + crisis in Côte d'Ivoire |
| Benin | 2010 | | | | X | Low agricultural production (floods) + slowdown of Nigeria |
| Benin | 2015 | | | | X | Low agricultural production (droughts) + slowdown of Nigeria |
| Burkina | 2000 | | | | X | Low price of cotton |
| Burkina | 2009 | | | | X | Low price of cotton + Low agricultural production (floods) |
| Mali | 2004 | | | | X | Low price of cotton |
| Niger | 2004 | | | | X | Low agricultural production (locust invasion and drought) |
| Senegal | 2002 | | | | X | Low agricultural production and phosphate production |
| Senegal | 2011 | | | | X | Low agricultural production (limited rainfall) |

The table displays the list of crises identified. A cross indicated that crisis is identified by the baseline approach (column "Baseline"), the first alternative approach based on parametric filter (column "Robust1"), based on negative growth (column "Robust2") and by the baseline approach implemented to GDP per capita growth (column "Robust 3"). Details about approaches are provided in Subsection 2.5. The last column is a narrative of sources of downturns in each crisis.

**Table A3**
Description of the variables.

| Variable | Definition | Type |
|---|---|---|
| A) dependent variables | | |
| Credit growth | Annual change in total customer loans in real terms (in %) | % |
| B) Ownership structure | | |
| Public | Dummy equal to 1 if the main shareholder is the State | Y/N |
| Public (maj + min) | Dummy equal to 1 if the State is a shareholder | Y/N |
| Public (min) | Dummy equal to 1 if the State is a minority shareholder | Y/N |
| Public (maj > 50%) | Dummy equal to 1 if the main shareholder is the State and owned 50% or more of capital | Y/N |
| Public (maj < 50%) | Dummy equal to 1 if the main shareholder is the State and owned less than 50% of capital | Y/N |
| Foreign | Dummy equal to 1 if the main shareholder is a foreigner | Y/N |
| Foreign (Africa) | Dummy equal to 1 if the main shareholder is a foreigner from Africa | Y/N |
| Foreign (no Africa) | Dummy equal to 1 if the main shareholder is a foreigner from another continent than Africa | Y/N |

**Table A3** (*continued*)

| Variable | Definition | Type |
|---|---|---|
| **C) Crisis indicators and macroeconomic variables** | | |
| Crisis | Dummy equal to 1 if a country experienced a crisis (see Subsection 2.5) | Y/N |
| Post-crisis | Dummy equal to 1 if a country experienced a crisis in the three years before | Y/N |
| Post-crisis(+1) | Dummy equal to 1 if a country experienced a crisis in the previous year | Y/N |
| Post-crisis(+2) | Dummy equal to 1 if a country experienced a crisis in two years before | Y/N |
| Post-crisis(+3) | Dummy equal to 1 if a country experienced a crisis in three years before | Y/N |
| Election | Dummy equal to 1 if a country had an election in year t | Y/N |
| GFC | Dummy equal to 1 for GFC crisis years (2008–09) | Y/N |
| GDP growth | Annual percentage growth of GDP | % |
| **D) Bank-level control variables** | | |
| Total assets | Total assets in constant FCFA (one lag) | Value |
| Equity | Ratio of equity to total assets | % |
| Loan/Ta | Ratio of loan to total assets | % |
| Deposit | Ratio of deposits over total liabilities | % |
| Liquidity | Ratio of liquid assets to total assets | % |

**Table A4**

Analysis year by year.

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Crisis | −0.132** | −0.449*** | −0.150** | −0.703*** |
| | (−2.31) | (−3.80) | (−2.16) | (−4.33) |
| Crisis x Public | | 0.423*** | | 0.697*** |
| | | (2.86) | | (3.58) |
| Crisis x Foreign (Africa) | | 0.225 | | 0.498** |
| | | (1.55) | | (2.58) |
| Crisis x Foreign (no Africa) | | 0.423** | | 0.635*** |
| | | (2.45) | | (2.78) |
| Post-crisis(+1) | | | −0.0668 | −0.723** |
| | | | (−0.81) | (−2.56) |
| Post-crisis(+1) x Public | | | | 0.709** |
| | | | | (2.40) |
| Post-crisis(+1) x Foreign (Africa) | | | | 0.734** |
| | | | | (2.47) |
| Post-crisis(+1) x Foreign (no Africa) | | | | 0.713** |
| | | | | (2.43) |
| Post-crisis(+2) | | | 0.0492 | −0.507* |
| | | | (0.29) | (−1.69) |
| Post-crisis(+2) x Public | | | | 0.591* |
| | | | | (1.88) |
| Post-crisis(+2) x Foreign (Africa) | | | | 0.903* |
| | | | | (1.87) |
| Post-crisis(+2) x Foreign (no Africa) | | | | 0.282 |
| | | | | (0.93) |
| Post-crisis(+3) | | | −0.0764 | −0.486** |
| | | | (−1.02) | (−2.37) |
| Post-crisis(+3) x Public | | | | 0.733*** |
| | | | | (2.89) |
| Post-crisis(+3) x Foreign (Africa) | | | | 0.341 |
| | | | | (1.51) |
| Post-crisis(+3) x Foreign (no Africa) | | | | 0.409** |
| | | | | (2.01) |
| Obs | 1237 | 1237 | 1237 | 1237 |
| # banks | 107 | 107 | 107 | 107 |
| Bank FE | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes |
| CV | Yes | Yes | Yes | Yes |

The dependent variable is credit growth, which is the growth rate of loans in real franc CFA. We regress credit growth on crisis and post-crisis dummies, bank ownership and bank-level variables in the period 2000–2019. Crisis is a dummy equal to 1 if country c experienced a crisis at year t (see Table A2 for the list of crises). Post-crisis dummy equal 1 in the three years after a crisis. Public is a dummy equal to 1 if the bank is a domestic state-owned bank (majority holder is the State). Foreign (Africa) is a dummy equal to 1 if the major shareholder is a foreigner from Africa and Foreign (no Africa) equal to 1 if the major shareholder is a foreigner from a non-African country. The omitted category is privately owned banks. Bank-level controls (unreported) are the log of total assets, the ratio of equity to total assets, the ratio of loans to assets, the ratio of deposits to total liabilities and the ratio of liquid assets over total assets. All control variables entered with one lag. Models are estimated using a two-way fixed effect estimator (bank and year). The *p*-values for clustered standard errors at the bank level are given in parentheses, and ***, **, * correspond to the 1%, 5%, and 10% levels of significance, respectively.

**Table A5**
Testing parallel trend assumption.

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| t-5 | | −0.0863 | | −0.0245 |
| | | (−0.94) | | (−0.22) |
| t-5 x Public | | 0.138 | | 0.0743 |
| | | (0.78) | | (0.44) |
| t-4 | | 0.0288 | | −0.00872 |
| | | (0.26) | | (−0.08) |
| t-4 x Public | | −0.0537 | | 0.0597 |
| | | (−0.31) | | (0.36) |
| t-3 | 0.0536 | 0.0924 | 0.000628 | 0.0485 |
| | (0.52) | (0.88) | (0.01) | (0.36) |
| t-3 x Public | −0.132 | −0.135 | −0.0221 | −0.00845 |
| | (−0.88) | (−0.84) | (−0.15) | (−0.05) |
| t-2 | −0.0787 | −0.0452 | −0.117 | −0.0792 |
| | (−0.81) | (−0.46) | (−1.04) | (−0.60) |
| t-2 x Public | 0.130 | 0.108 | 0.227 | 0.220 |
| | (0.71) | (0.53) | (1.16) | (0.96) |
| t-1 | −0.142 | −0.106 | | |
| | (−1.66) | (−1.26) | | |
| t-1 x Public | 0.0107 | −0.0216 | | |
| | (0.08) | (−0.15) | | |
| Obs | 1237 | 1054 | 1237 | 1054 |
| # banks | 107 | 107 | 107 | 107 |
| Bank FE | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes |
| CV | Yes | Yes | Yes | Yes |

The dependent variable is Credit growth, which is the growth rate of loans in real Franc CFA in columns (1) to (4). We regress Credit growth on pre-crisis year dummies (from t-5 to t-1), their interaction with public ownership of banks, and bank-level variables in the period 2000–2019. We also consider crisis dummy and post-crisis dummy in column (3) and (5), explaining the omission off the year just before a crisis (t-1). Year and bank dummies are incorporated in all specifications. Bank-level controls (unreported) are the log of total assets, the ratio of equity to total assets, the ratio of loans to assets, the ratio of deposits to total liabilities, and the ratio of liquid assets over total assets. Models also include interaction between foreign banks and crisis and post-crisis years. All control variables enter with on lag. Models is estimated using OLS estimator. The p-values for clustered standard errors at the bank level are given in parentheses and ***, **, * correspond to the 1%, 5%, and 10% levels of significance, respectively.

**Table A6**
Robustness checks.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Crisis | −0.706*** | −0.695*** | 0.143 | −0.781*** | −0.654*** | −0.695*** | −0.269*** | 0.381 |
| | (0.164) | (0.165) | (0.420) | (0.205) | (0.171) | (0.163) | (0.097) | (0.616) |
| Crisis x Public | 0.712*** | 0.707*** | −0.116 | 0.706*** | 0.658*** | 0.718*** | 0.346*** | −0.344 |
| | (0.205) | (0.206) | (0.448) | (0.195) | (0.205) | (0.202) | (0.107) | (0.528) |
| Post-crisis | −0.566** | −0.560** | −0.366** | −0.556** | −0.851** | −0.563*** | −0.137 | 0.578 |
| | (0.247) | (0.247) | (0.153) | (0.245) | (0.246) | (0.245) | (0.128) | (0.348) |
| Post-crisis x Public | 0.670** | 0.669** | 0.379** | 0.674*** | 0.686*** | 0.714*** | 0.211 | −0.844* |
| | (0.264) | (0.264) | (0.163) | (0.258) | (0.259) | (0.263) | (0.130) | (0.409) |
| GDP growth | | | | −0.008 | | | | |
| | | | | (0.011) | | | | |
| GFC x Public | | | | | 0.152 | | | |
| | | | | | (0.167) | | | |
| Post-GFC x Public | | | | | 0.079 | | | |
| | | | | | (0.127) | | | |
| Obs | 1237 | 1237 | 1237 | 1237 | 1237 | 1165 | 1139 | 1146 |
| # banks | 107 | 107 | 107 | 107 | 107 | 102 | 107 | 107 |
| Bank FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| CV | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | 0.32 | 0.32 | 0.32 | 0.32 | 0.33 | 0.33 | 0.19 | 0.08 |

The dependent variable is Credit growth, which is the growth rate of loans in real Franc CFA in columns (1) to (6), the sum of customer loans and interbank loans in column (7) and interbank loans in columns (8). We regress Credit growth on crisis and post-crisis dummies, bank ownership and bank-level variables in the period 2000–2019 Crisis is a dummy equal to 1 if country c experienced a crisis at year t. In columns (1) to (3), we change the definition of crisis (see Subsection 2.5 for details). Column (1) defines crisis based on the cyclical component of GDP growth extracted from a parametric approach. Column (2) defines a crisis if GDP growth is negative. Column (3) defines crisis by applying the baseline approach to GDP per capita growth. In the rest of columns, we employ the baseline approach (see Table A2 for the list of crises). Post-crisis dummies refer to years after crisis event. Public is a dummy equal to 1 if the bank is a state-owned bank. Public dummy is interacted with crisis dummies and post-crisis dummies. Year and bank dummies are incorporated in all specifications. Bank-level controls (unreported) are the log of total assets, the ratio of equity to total

assets, the ratio of loans to assets, the ratio of deposits to total liabilities, and the ratio of liquid assets over total assets. Models also include interaction between foreign banks and crisis and post-crisis years. All control variables enter with on lag. Models is estimated using OLS estimator. The p-values for clustered standard errors at the bank level are given in parentheses and ***, **, * correspond to the 1%, 5%, and 10% levels of significance, respectively.

## Appendix B. Sensitivity analysis

The baseline model consists on analyzing how public banks behave during and after a crisis. As explained in the manuscript, another approach has been developed to assess countercyclicility of public banks: the sensitivity of credit growth to macroeconomic growth. For sake of transparency, we present results using this model. We show that our findings are closed to those provided by Zins and Weill (2018).

### B.1. Empirical method

We follow approach adopted by previous works (Bertray et al., 2015; Zins and Weill, 2018) by running the following equation:

$$Credit\_Gr_{i,c,t} = \alpha_i + \beta_1 GDPPC\_Gr_{c,t} + \beta_2 GDPPC\_Gr_{c,t} * Public_i + \nabla X_{i,c,t-1} + \mu_t + \varepsilon_{i,c,t}$$

where $Credit\_Gr_{i,c,t}$ is the consumer credit growth of bank $i$ operating in country $c$ at year $t$, $GDPPC\_Gr_{c,t}$ is the annual growth of GDP per capita in country $c$ at year $t$, $Public_i$ and $Foreign_i$ are dummy variables equals to one if the firm is a public or a foreign bank, respectively. We add bank fixed effects ($\alpha_i$)[18] allowing us to control for all unobserved time-constant characteristics of the bank and time fixed effects ($\mu_t$) to control for common shocks (as change in monetary policy, which is common in WAEMU).

We finally add several bank-level control variables ($X_{i,c,t-1}$). The log of total assets (in constant local currency) controls for bank size. The ratio of equity to total assets is added to control for bank soundness. We also include the ratio of loans over assets that represents the relative importance of lending in a bank's activities. The liquidity ratio, constructed as the ratio of liquid assets to total assets, allows us to measure bank soundness and its ability to sustain lending. We finally include deposits over total liabilities as a measure of the stability of bank's funding (non-deposit funding tends to flee quickly during periods of instability). In line with previous works, all bank-level control variables are one-year lagged. Description of variables are displayed in Table A2.

Eq. (1) is first estimated using a static model. We then consider a dynamic model, by including the lagged dependent variable in regressions ($Credit\_Gr_{i,c,t-1}$). For the latter specification, we no longer rely on OLS and employ a dynamic GMM-System estimator developed by Blundell and Bond (1998) using two-step GMM estimation and the Windmeijer (2005) correction to minimize the downward bias in standard errors.

According to the hypothesis of procyclicality of banks, we expect that $\beta_1 > 0$ indicating that banks increase lending in periods of booms and reduces them during slowdowns. Public banks are less procyclical than domestic private banks if: $\beta_2 < 0$. Public banks act counter-cyclically if $(\beta_1 + \beta_2) < 0$.[19]

### B.2. Results

We first replicate a model of sensitivity of loan growth to macroeconomic growth to study whether public banks differ from their counterparts in West Africa. Table B1 displays econometric results for the static model. The first column only incorporates GDP per capita growth without interactions. The second column adds interactions with ownership variables (Public and Foreign). The third column incorporates bank-level control variables. The last two columns decompose analysis between periods of positive (column 4) and negative (column 5) growth to investigate whether public banks react differently in the two phases.

Result displayed in the first column of Table B1 indicate that banks are procyclical in WAEMU as indicated by the positive coefficient associated to the GDP per capita growth ($\beta_1$). In economic terms, a 1 % point increase of GDP per capita growth raises lending by 1.3 pp. We then interact GDP per capita growth with indicators for public ownership in the rest of the Table B1. While interactions are negative, they are not statistically significant at the usual thresholds. The results are therefore in line with those reported by Zins and Weill (2018) for a sample of North and sub-Saharan African banks but challenge results from other continents (cf. Table A1). Finally, we decompose between periods of positive and negative growth. We highlight that public banks do not differ from domestic private banks in periods of growth (procyclical). However, they tend to maintain their lending during slowdowns (column 5). This result should be treated with caution due to the sharp reduction in the number of observations.

Table B2 replicates the same model by using a dynamic panel data as often implemented in the literature (Bertray et al., 2015; Zins and Weill, 2018). The intuition behind the dynamic model is that the dependent variable presents an inertia. We employ the System-GMM estimators due to bias induced by OLS in dynamic panel model. We first validate the model specifications by reporting the usual

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[18] Contrary to existing works (Bertray et al., 2015; Zins and Weill, 2018) that rely on country dummies, we prefer to incorporate bank fixed effects that encapsulate country time-invariant factors. In addition, the bank status in level is taken into consideration by the inclusion of bank dummies. Results are not sensitive to this choice.

[19] The same analysis can be done for foreign-owned banks by referring to $\beta_3$ instead of $\beta_2$.

tests displayed at the bottom of the Table B2.[20] Findings regarding interest variable (GDP per capita growth and interactions with ownership) are in line with static model, even if statistical significance is reduced. The loss of efficiency can be explained by the nature of the estimator (instrumental variable approach). We no longer rely on dynamic panel because credit growth does not present a strong inertia. Coefficient associated with lagged credit growth is almost never statistically significant and its size is rather limited. As a result, the rest of the analysis is based on a static model.

We check whether our main findings are still observed when replacing GDP per capita growth with GDP growth rate as a measure of the business cycle. Results, available upon request, point out that this change does not alter our conclusion.

To sum up, the first analysis of the sensitivity of lending to economic growth point out that (i) banks in WEAMU are procyclical, (ii) public banks do not strongly differ from domestic private banks, except during downturns.

**Table B1**
Sensitivity of lending to GDP per capita growth, static model.

|  | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| *GDPpc growth* | *1.305\*\*\** | *2.243\*\** | *2.169\** | *1.731* | *8.225\*\** |
|  | *(3.00)* | *(2.18)* | *(1.83)* | *(0.50)* | *(2.43)* |
| **Public\*GDPpc growth** |  | −1.594 | −1.429 | −0.0585 | −7.863\*\* |
|  |  | (−1.32) | (−1.04) | (−0.01) | (−2.25) |
| Total Assets (log) |  |  | −0.146\*\* | −0.142\*\* | −0.205\*\* |
|  |  |  | (−2.35) | (−2.01) | (−2.35) |
| Equity |  |  | −0.108 | −0.179 | −0.214 |
|  |  |  | (−0.41) | (−0.61) | (−0.62) |
| Loan/TA |  |  | −1.120\*\*\* | −1.373\*\* | −0.842\*\* |
|  |  |  | (−3.00) | (−2.24) | (−2.13) |
| Deposit |  |  | 0.124 | −0.0465 | −0.0252 |
|  |  |  | (0.61) | (−0.16) | (−0.08) |
| Liquidity |  |  | 0.0762 | −0.227 | 0.440 |
|  |  |  | (0.20) | (−0.37) | (0.91) |
| b1 + b2 | – | 0.648 | 0.741 | 1.672 | 0.362 |
| b1 + b3 | – | 1.411\*\* | 0.806 | 0.953 | 3.619\* |
| Obs. | 1490 | 1490 | 1237 | 915 | 264 |
| # banks | 112 | 112 | 108 | 108 | 92 |
| Bank FE | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes |
| R² | 0.17 | 0.17 | 0.32 | 0.35 | 0.52 |

The dependent variable is Credit growth, which is the growth rate of loans in real Franc CFA. We regress Credit growth on bank ownership and bank-level variables in the period 2000–2019. GDP per capita growth is the annual percentage growth rate of GDP per capita. Public are dummies respectively equal to 1 if the bank is a domestic state-owned bank. The omitted category is privately-owned banks. Public bank category is interacted with GDP per capita growth in order to capture the different lending cyclicality relative to domestic private banks' lending cyclicality. Year and bank dummies are incorporated in all specifications. All control variables enter with on lag. Models is estimated using OLS estimator. The *p*-values for clustered standard errors at the bank level are given in parentheses and \*\*\*, \*\*, \* correspond to the 1%, 5%, and 10% levels of significance, respectively.

**Table B2**
Sensitivity of lending to GDP per capita growth, dynamic model.

|  | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Lag(credit growth) | 0.058 | 0.0614 | 0.0701\*\* | 0.0777 | 0.175 |
|  | (1.43) | (1.65) | (2.12) | (1.53) | (1.55) |
| *GDPpc growth* | *0.723* | *2.029* | *2.522* | *−0.969* | *−0.264* |
|  | *(1.46)* | *(1.46)* | *(0.91)* | *(−0.33)* | *(−0.11)* |
| **Public\*GDPpc growth** |  | −1.419 | −1.787 | 0.455 | 0.386 |
|  |  | (−0.80) | (−0.60) | (0.11) | (0.16) |
| Total Assets (log) |  |  | −0.159\* | −0.180 | −0.0469 |
|  |  |  | (−1.93) | (−1.48) | (−0.37) |
| Equity |  |  | −0.664 | −0.733 | −0.353 |
|  |  |  | (−1.37) | (−1.09) | (−0.86) |
| Loan/TA |  |  | −0.727 | −1.431\*\* | −0.867 |
|  |  |  | (−1.46) | (−2.54) | (−0.97) |
| Deposit |  |  | 0.0118 | 0.0501 | 0.429 |
|  |  |  | (0.05) | (0.13) | (0.77) |
| Liquidity |  |  | 0.622 | 0.690 | 1.040 |
|  |  |  | (1.45) | (1.39) | (1.43) |

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[20] As expected AR(1) is significant contrary to AR(2) validating the lag structure retained. In addition, instruments set is not endogenous as indicated by the Hansen over-identification test.

**Table B2** (*continued*)

|  | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| b1 + b2 | – | 0.610 | 0.735 | −0.514 | 0.122 |
| b1 + b3 | – | 1.003* | 1.155 | 0.520 | 1.082 |
| Obs. | 1424 | 1424 | 1179 | 915 | 264 |
| # banks | 111 | 111 | 108 | 108 | 92 |
| Bank FE | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes |
| # instruments | 56 | 94 | 166 | 166 | 135 |
| AR(1) | 0.011 | 0.011 | 0.016 | 0.064 | 0.099 |
| AR(2) | 0.319 | 0.323 | 0.859 | 0.970 | 0.301 |
| Hansen OIT | 0.187 | 0.225 | 0.999 | 0.999 | 0.994 |

The dependent variable is Credit growth, which is the growth rate of loans in real Franc CFA. We regress Credit growth on bank ownership and bank-level variables in the period 2000–2019. GDP per capita growth is the annual percentage growth rate of GDP per capita. Public are dummies respectively equal to 1 if the bank is a domestic state-owned bank. The omitted category is privately-owned banks. Public bank category is interacted with GDP per capita growth in order to capture the different lending cyclicality relative to domestic private banks' lending cyclicality. Year and bank dummies are incorporated in all specifications. All control variables enter with on lag. Models is estimated using GMM-System estimator (Blundell and Bond, 1998). The p-values for robust standard errors following the Windjmeier correction are given in parentheses and ***, **, * correspond to the 1%, 5%, and 10% levels of significance, respectively.

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