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Alexandra Zins

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THÈSE

présentée par :

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Essays on Banking in Africa

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A Simon et Marguerite,

« L'Université de Strasbourg n'entend donner ni approbation ni improbation aux opinions exprimées dans cette thèse. Ces opinions doivent être considérées comme propres à leur auteur. »

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List of Abbreviations and Acronyms

AERC	African Economic Research Consortium
AR	Autocorrelation
BGFI	Banque Gabonaise et Français Internationale
BMCE	Banque Marocaine du Commerce Extérieur
BNP	Banque Nationale de Paris
BPCE	Banque Populaire Caisse d'Epargne
BPI	Banco Português de Investimento
BSIC	Banque Sahélo-Saharienne pour l'Investissement et le Commerce
CV	Control Variables
DEA	Data Envelopment Analysis
DOTS	Direction of Trade Statistics
ES	Enterprise Surveys
GBCP	Groupe Banque Centrale Populaire
GDP	Gross Domestic Product
GFC	Global Financial Crisis
GFDD	Global Financial Development Database
GMM	General Method of Moments
G20	Group of Twenty
HSBC	Hong Kong and Shanghai Banking Corporation
I.I.D	Independent and Identically Distributed
IMF	International Monetary Fund
IT	Information Technology
IV	Instrumental Variable
NPL	Non-Performing Loan
OEA	Other Earning Assets
PAB	Pan-African Bank
ROAA	Return On Average Assets
ROE	Return On Equity
SME	Small and Medium Enterprises
SSA	Sub-Saharan Africa
TC	Total Costs

UBA	United Bank for Africa
UK	United Kingdom
WAEMU	West African Economic and Monetary Union
WDI	World Development Indicators
WGI	World Governance Indicators
2SLS	Two-Stage Least Squares

General Introduction

In spite of an acceleration in economic growth over the past two decades, the African continent still faces important challenges before achieving a sustainable and inclusive development. First, the Millennium goals have not been fully reached as health, education and poverty reduction need further improvements. Indeed, the amount of people living with less than US \$1.90 a day decreased from 57 percent in 1990 to 43 percent in 2012 and the number of people living in poverty increased from 288 to 389 million (Beegle et al., The World Bank, 2016). Second, the population is growing faster than anywhere else with 31 countries out of the 54 African countries that are projected to observe at least a doubling of their population by 2050 (Bourguignon, 2015; Ncube, 2015). The young population arriving on the job market increases the need for productive employment. Finally, the lack of infrastructures remains a key concern for African economies, notably access to safe drinkable water, power generation capacity, household electrification, transport networks and communication (Dethier, 2015). According to the African Development Bank, Africa's infrastructure needs represent \$130 to \$170 billion a year (African Development Bank Group, 2018).

The literature on the finance-growth nexus demonstrates that financial development leads to economic growth thanks to an increase in capital accumulation and in its allocation efficiency (e.g. Levine, 2005). Indeed, well-performing intermediaries strengthen resource allocation efficiency and total factor productivity growth (Beck et al., 2000). Moreover, an increase in financial development leads to poverty reduction by decreasing the amount of the population living with less than US \$ 1 a day (Beck et al., 2007). It also reduces income inequality and increases real per capita GDP (Beck et al., 2007). Financial intermediaries can thus play a key role in bringing about a sustainable and inclusive growth in Africa.

Assessing financial systems in Africa

Dominated by banks, African financial systems have been evolving a lot during the last decades. In the end of the 1980s, the banking sectors experienced financial liberalization reforms and institutional and regulatory improvements (Beck and Cull, 2015; Mecagni et al., 2015). Consequently, African banks have been turning into resilient and stable actors over the following period. They have been increasing their capitalization levels and developing

profitable activities. Their increasing soundness combined with little reliance on external funding, large amounts of liquidity and the absence of exposure to toxic financial assets helped them facing the 2008 global financial crisis (Mlachila et al., 2013). No systemic banking crisis has been recorded in Africa since 1995, illustrating the growing stability of African banking sectors. Indeed, the continent faced many systemic banking crises before reforms in the 1980s (Mlachila et al., 2013.).

However, characteristics of the economy and intrinsic features of African banks slow down the development of African banking sectors.

Characteristics of African economies can make financial intermediation harder for African banks. First, many economies in which banks are operating are still very small, preventing financial institutions from realizing scale economies (Beck and Cull, 2015). Moreover, a huge part of the population lacks formal documentation such as land titles, enterprise registration and even formal addresses (Beck and Cull, 2015). Many opaque customers are thus incapable of providing collateral and formal documentation, and banks have to bear higher risks and costs to meet customers' needs. Such situation leads to the exclusion of an important part of the population from formal financial services. Some excluded individuals thus resort on informal finance while others must give up their economic projects. Second, African financial institutions face volatility through fluctuations of customer income, currencies, and commodity prices and exports. Third, governance still needs improvements as corruption, low quality of contract enforcement and market failures threaten the activities of banks (Beck and Cull, 2015). Finally, banking systems in Africa still record high levels of concentration (Fosu, 2013). However, competition is increasing thanks to reforms cited above and African banking systems are comparable to other banking systems in emerging economies (Fosu, 2013).

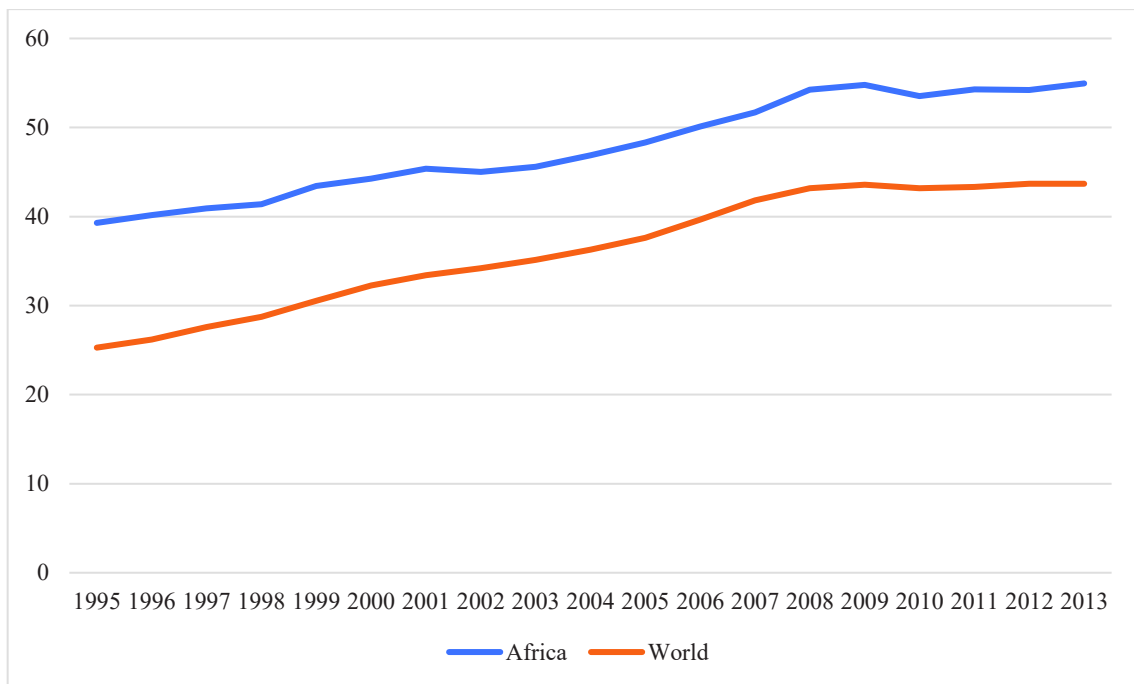
Financial intermediation is also complicated and insufficient because of intrinsic features of African banking systems. First, banks hold a lot of liquidity. Indeed, most of them choose to hold huge amounts of liquidity to face high loan default rates and the lack of developed capital markets (Andrianova et al., 2015; Mecagni et al., 2015; Nketcha Nana and Samson, 2014). Such attitude is reinforced because of the absence of deposit insurance schemes in many economies. Moreover, people are more used to resort to cash as payment systems are still underdeveloped. Second, African banks are also inefficient intermediaries as a large proportion of them invest in government securities like treasury bills rather than providing

credit to the private sector (Allen et al., 2011). Consequently, the ratio of domestic credit to the private sector as a percentage of GDP was of 36.3 percent in 2014 while such ratio was of 45.5 in Latin America and Caribbean and of 134.3 percent in OECD high income countries (Nyantakyi and Sy, 2015). Third, the services they provide are expensive for their customers. Indeed, interest rate spreads and service fee levels are important (Mlachila et al., 2013). Finally, they offer short-term maturities to their clients with on average 60 percent of loans that have a maturity of less than one year (Mlachila et al., 2013.).

The profile of financial intermediaries in Africa

An important change brought about with financial liberalization is the evolution of the ownership structure of the banking system. Dominated by state-owned banks in the 1980s, privatization reforms led to the increasing presence of foreign banks on the continent. As an illustration, Figure 1 shows that Africa follows the global trend with an increase in the number of foreign banks relative to total banks. However, figures are always higher in Africa than in the rest of the world. Foreign banks accounted for 39 percent of the banking system in 1995 and represented 55 percent in 2013. In terms of share, foreign banks held 42.7 percent of total bank assets in Africa in 2014 (Nyantakyi and Sy, 2015). It is however important to keep in mind that African banking sectors are heterogenous. Indeed, foreign banks held 61.7 percent of Sub-Saharan African total bank assets in 2014 (ibid.). Northern Africa records a lower proportion of foreign banks than the rest of the continent, and Sub-Saharan Africa is the developing region that concentrates the highest level of foreign banks in terms of numbers. Thanks to their expanding presence, foreign banks have been major players of the African banking systems' development (Allen et al., 2011).

Figure 1: Foreign banks among total banks (%)



Source: Author's calculation based on data from Claessens and Van Horen (2015) from the GFDD

However, the ownership structure of foreign banks in Africa has recently changed. Banks from Europe¹ that had been establishing their activities for a long time have been reducing their share while foreign banks from emerging economies slowly replace them. Besides foreign banks from non-African emerging countries², banks from African economies³ are spreading their activities and establishing important cross-border networks. These latter actors, also known as Pan-African banks (PABs), are majority-owned by African shareholders and their headquarters are in African cities. Major PABs have become systemic⁴, with the largest ones being present in at least 10 African countries (Enoch et al., 2015). As illustrated by Figure 2, some of them are now more important actors than the well-established European banks (Mecagni et al., 2015).

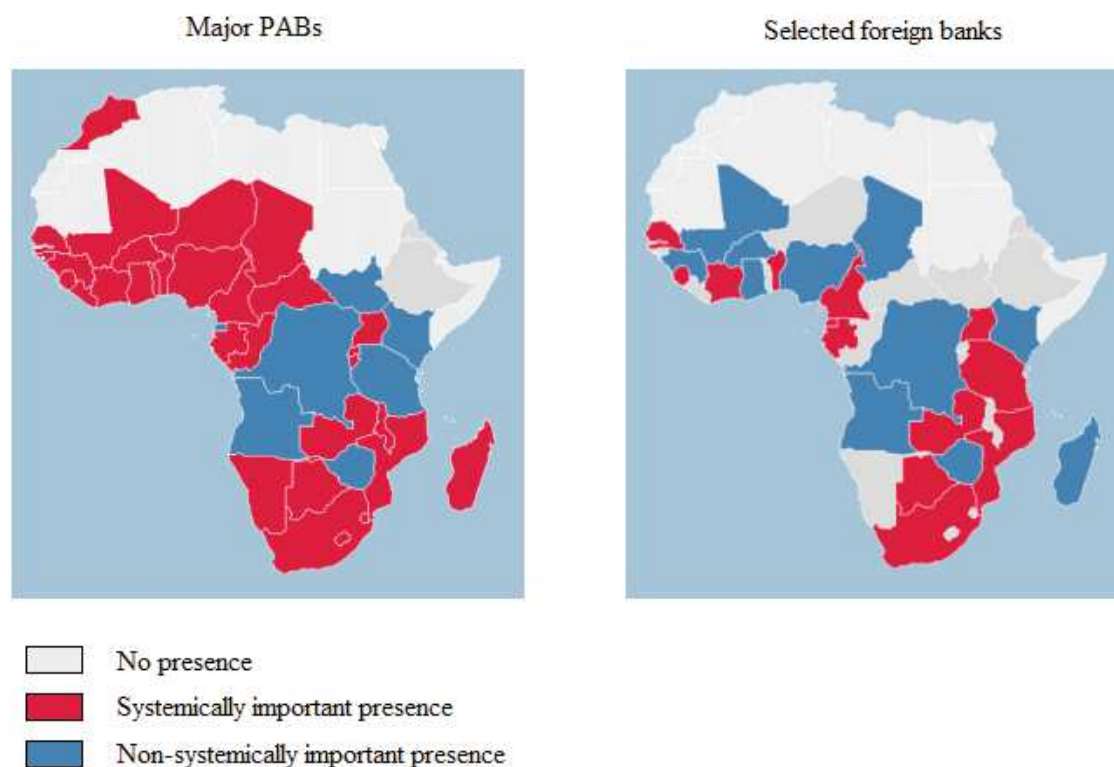
¹ For example, France Portugal or the United Kingdom.

² For example, China, Brazil, India or Bahrain.

³ Mainly from Kenya, Morocco, Nigeria, South Africa and Togo.

⁴ According to Beck et al. (2014), main PABs can be considered as systemically important because of the share of assets they hold in host banking systems. For example, in 2011, Ecobank held around 40 percent of bank assets in Liberia, the Central African Republic and Guinea, Standard bank held 47 percent of Lesotho's bank assets, BMCE held around 30 percent of bank assets in Madagascar and Benin, etc.

Figure 2: Selected Pan-African banks and foreign banks⁵: systemic importance by country, 2013



Note: Systemically important presence includes parents in their home countries and subsidiaries with a deposit share of more than 10 percent of banking system deposits. Sources: Enoch et al. (IMF, 2015).

The impact of foreign banks presence on host economies

The presence of foreign banks can have opposite effects on host economies in terms of efficiency and competition, stability, and financial depth and outreach.

First, as global banks, they can benefit from economies of scale, more advanced technologies, innovative skills and management tools, risk diversification and a better access to capital. Such advantages could be beneficial for host economies if the presence of foreign banks brings about new financial products and services, lower interest rates and advanced delivery channels. Consequently, foreign banks presence could increase competitive pressure and efficiency in the host banking system. Literature tends to conclude that foreign banks

⁵ Major PABs are: Attijariwafa, BMCE, GBCP (from Morocco), UBA (from Nigeria), Standard Bank (from South Africa), Ecobank and Oragroup (from Togo).

Selected foreign banks are Standard Chartered, Barclays, HSBC (from the UK), Société Générale, BNP Paribas, BPCE, Crédit Agricole (from France), Caixa Geral de Depositos, Banco Commercial Portugues, Banco BPI, Banco Espirito Santo, Banif Financial Group, Finibanco Portugal (from Portugal), Procredit Holdings, Deutsche Bank (from Germany), Citigroup (from the United States), and Bank of Baroda (from India).

present higher profits and interest margins than domestic banks and decrease intermediation costs (Barajas et al., 2000; Claessens et al., 2001). Studies realized in European transition countries (e.g. Weill, 2003; Bonin et al., 2005; Karas, et al., 2010) and in emerging countries (e.g. Bonaccorsi di Patti and Hardy in Pakistan, 2005; Berger et al. in China, 2009; Gulati and Kumar in India, 2016) show that foreign banks bring about higher efficiency in the banking system. However, some studies do not find any robust difference between foreign and domestic banks (Figueira et al. in Latin America, 2009; Barros and Wanke in Brazil, 2014), while studies focusing on developed countries conclude that foreign banks are less efficient (DeYoung and Nolle, 1996; Sathye, 2001) and have lower profits than domestic banks (Claessens et al., 2001). Africa is still understudied in this literature. Moreover, results tend to differ according to the geographic area under analysis. The literature is not conclusive regarding competition since some papers find that foreign banks participation brings about a less competitive environment (e.g. Yeyati and Micco in Latin America, 2007) while others conclude that foreign banks presence leads to higher competition in host economies (e.g. Barajas et al. in Colombia, 2000). In Africa, Léon (2016) observes an increase in competition since the mid-2000s correlated with the expansion of regional foreign banks on the continent.

Second, foreign banks presence may have an impact on the stability of the host economy. On the one hand, the presence of foreign banks can strengthen soundness of the financial host system through two channels. The first channel is through greater diversification. Foreign banks' home countries and host countries have different business cycles. When these business cycles are not synchronized, the presence of foreign banks can mitigate financial shocks in host countries (Bruno and Hauswald, 2014). Indeed, Arena et al. (2007) show that credit growth of foreign banks is less dependent on evolutions in monetary conditions in host economies. Moreover, customers in host economies have access to a wider choice of suppliers and can diversify across foreign and domestic banks. The second channel is through the fact that foreign banks presence can contribute to improve regulatory and supervisory frameworks (Beck et al., 2014). Prudential authorities face new challenges when foreign banks enter the market because of a spread in more sophisticated products and tools. They must improve regulatory quality in order to monitor these new actors. They might also be induced to enhance quality in regulatory frameworks in order to attract more foreign banks in the economy. On the other hand, foreign banks presence can bring about more risk in the host financial system. As mentioned above, foreign banks' home countries and host countries have different business cycles. Foreign banks can be impacted by both home and host business cycles. When a

recession or a crisis occurs in the home economy, foreign banks can propagate shocks in host economies where they are active. Indeed, they can impact customers by decreasing their lending (Iwanicz-Drozdowska and Witkowski, 2016). Moreover, they can withdraw liquidity from their subsidiaries in order to help the headquarter through their internal capital market (De Haas and Lelyveld, 2014). Foreign banks can thus increase contagion risks by synchronizing business cycles (Popov and Udell, 2012; Kalemli-Ozcan et al., 2013).

Finally, foreign bank presence may influence financial depth and outreach. Financial depth and outreach deal with financial inclusion, defined as access to formal financial services. Once again, foreign banks' impact on financial inclusion is ambiguous. By diversifying the offer of financial services and providing innovations, greater competition and efficiency in the financial system, foreign banks may bring about an increase in financial inclusion in host economies. Several empirical studies show that foreign banks participation reduces barriers to accessing financial services (Beck, et al., 2008; Clarke et al., 2006). Financial inclusion deals with information asymmetries: to grant access to financial services, banks need first to assess the financial situation of their clients. To avoid the problem of information asymmetries, banks can resort on hard and soft information. Hard information refers to accounting information, credit history and collateral values, and allows banks to score their customers. Soft information refers to information gathered by a bank through its relationship with the customers. A large part of the population in developing countries, and notably in Africa, lacks the official documentation required to have access to financial services. Soft information is thus of prime interest to help the opaquest customers to be financially included. However, foreign banks and domestic banks differ in their use of soft information. Domestic banks have a comparative advantage as they can build relationships with customers in an easier way than foreign banks thanks to their knowledge of the environment and of the clients. Foreign banks offset their lack of expertise of the host environment with innovative techniques to monitor their customers, but these techniques mainly use hard information. Because of the use of hard information, foreign banks can cherry-pick their customers and focus on the wealthier, formally employed households (Beck and Brown, 2014) and most profitable, transparent firms (Mian, 2006; Beck and Martínez Pería, 2010; Gormley, 2010). If domestic banks used to serve opaque, riskier clients thanks to their benefits linked to transparent, wealthier ones, they cannot do this anymore when foreign banks enter the market and attract transparent customers. To keep competitive, domestic banks must reduce their activities with opaque clients, letting them credit-constrained. A cream-skimming phenomenon emerges and leads to a decrease in financial outreach,

observed in many empirical studies (Detragiache et al., 2008; Claessens and Van Horen, 2014a). However, the cherry-picking behaviour of foreign banks may not necessarily lead to a cream-skimming phenomenon. The market pressure they put in the banking system can push domestic banks to discipline their activities and to reduce their costs and prices. Foreign banks and domestic banks would then share the market. Foreign banks presence can thus increase access to financial services by expanding the global outreach to financial inclusion (Clarke et al., 2006; Giannetti and Ongena, 2012).

The aim of this dissertation is to provide some empirical insights on the impact of foreign banks on the three issues of efficiency, stability and financial inclusion in Africa.

Foreign banks not only differ from domestic banks, but they also differ from each other. Acknowledging the heterogeneity in the ownership structure of foreign banks is crucial to assess the impact of foreign banks on host economies (Van Horen, 2007; Claessens and Van Horen, 2014a). According to Van Horen (2007), foreign banks from developing countries have a competitive advantage in economies with a fragile institutional climate where foreign banks from developed countries are reluctant to establish their activities. She also concludes that proximity, economic integration and common language play a key role in attracting foreign banks. Such a result is confirmed by Claessens and Van Horen (2014b) who show that geographical, institutional and cultural dimensions influence location decisions of foreign banks. In addition, according to Mian (2006), geographic and cultural proximity between a subsidiary host country and its parent bank home country reduces the informational disadvantages faced by foreign banks.

Pan-African banks, as foreign banks from developing countries, might be less unwilling to spread their activities in neighbouring countries where contract enforcement and institutional frameworks are weak. Moreover, as regional foreign banks, they might benefit from more geographic and cultural proximity than foreign banks from non-African developing countries. They would thus be less exposed to informational disadvantages than foreign banks from non-African developing countries. We thus consider that Pan-African banks differ from both foreign banks from developed countries and foreign banks from non-African developing countries.

In this dissertation, we distinguish between the three kinds of foreign banks coexisting on the continent⁶ and compare them with domestic private and public banks. Each chapter attempts to assess the global impact of foreign banks on African banking systems, but also the specific impact of Pan-African banks. One key question we ask is to determine **whether Pan-African banks are major actors of the development of a sustainable and inclusive financial sector.**

Contribution

The dissertation contributes to a better understanding of the evolution of African banking systems with a specific focus on foreign banks. The contribution is threefold. First, the dissertation adds to the literature on African banking systems by studying how recent structural changes influence both the economies and the financial intermediaries on the continent. Our dissertation assesses some of the impacts of liberalization reforms that led to the increase in foreign banks participation in Africa. Second, the dissertation contributes to the understanding of the implications of Pan-African banks' expansion for Africa. It analyses regional foreign banking and provides some conclusions about their impacts on host banking systems. This work thus assesses whether regional foreign banks' expansion is detrimental or beneficial for African financial systems. In doing so, this work hopes to inform policy-makers in their decision to favour or discourage the expansion of such actors. Expanding knowledge on this issue is even more important as Pan-African banks are tremendously expanding their activities. Finally, the dissertation contributes more globally to the literature on bank ownership by adding information on the heterogeneity of foreign banks and its impact on host banking systems through multiple issues.

Contents of the dissertation

The first chapter⁷ studies cost efficiency of the different types of banks exerting their activities in African countries. Cost efficiency measures how close a bank's cost is to its optimal cost when producing the same bundle of output.

⁶ Foreign banks from developed countries, foreign banks from non-African developing countries and foreign banks from African developing countries (PABs).

⁷ Co-written with Laurent Weill, currently revised and resubmitted in Economic Systems.

As mentioned earlier, the empirical literature linking bank ownership and efficiency gives different results depending on the area under study. To explain such differences, Berger et al. (2000) suggest two key hypotheses. On the one hand, domestic banks might benefit from the home field advantage hypothesis. As local banks, they know their clients and the environment better while foreign banks bear higher costs in order to adjust their services to the customers. On the other hand, foreign banks might benefit from the global advantage hypothesis. As global banks, they succeeded in establishing better management abilities, best-practice policies and innovative tools enabling them to reduce their costs. The global advantage hypothesis would explain why foreign banks are more efficient in developing countries; they offset their lack of knowledge of the local environment with their global experience. In developed countries however, domestic banks would also benefit from higher skills while foreign banks would not have any comparative advantage anymore. Our first aim is thus to compare cost efficiency of foreign and domestic banks since no consensus seems to emerge in the literature dedicated to Africa (Chen, 2009; Kirpatrick et al., 2008; Hauner and Peiris, 2008; Okeahalam, 2008; Kablan, 2007).

The second objective of the chapter is to compare the three foreign ownership types (developed, non-African developing, Pan-African) to see whether one category is more cost efficient. Our main hypothesis here lies on the fact that Pan-African banks would benefit from both the local advantage and the global advantage described by Berger et al. (2000). PABs might bear less informational costs as they resort to stand-alone subsidiaries (Beck et al., 2014). As regional foreign banks, cultural differences between host and home countries might be less important than for non-regional foreign banks. Moreover, as they are becoming systemic on the continent, they are developing innovative tools to strengthen their activities.

To check whether foreign banks are more efficient than domestic banks and whether PABs are the most efficient banks on the continent, we study 248 banks in 39 African countries over the period 2002 to 2015. We use the one-step stochastic frontier model developed by Battese and Coelli (1995), a model commonly used to investigate the impact of ownership on efficiency in the literature (e.g., Fries and Taci, 2005; Karas et al., 2010). In our additional work, we go deeper in the understanding of the role of proximity. We consider institutional similarity and geographic distance between host and home countries.

Our results reveal that foreign banks are more cost efficient than domestic banks in Africa. Moreover, Pan-African banks are shown to be the most cost efficient on the continent.

When considering our additional estimations, we find that institutional similarity increases PABs' cost efficiency while geographic distance reduces PABs' cost efficiency. Our results seem to demonstrate that regional foreign banks in Africa benefit from both local and global advantages.

The second chapter⁸ analyses cyclical lending according to bank ownership in Africa. Banks adopt a pro-cyclical lending behaviour when they grant too many loans during economic booms and significantly cut lending during economic recessions. Such behaviour can amplify recessions during downturns and generate an overheating of the economy during booms. Cyclical lending is thus linked with the more global issue of stability in the economy.

The ownership structure of banks matters as foreign banks and domestic banks might adopt a different lending behaviour. On the one hand, foreign banks might be more subjected to adopt a cyclical lending behaviour because of a “lack of loyalty” on their behalf (Fungáčová et al., 2013). On the other hand, well-established foreign banks might consider the host country as a “second home market” and would thus have less incentives to adopt a pro-cyclical behaviour (Bonin and Louie, 2017). Domestic state-owned banks might be more willing to adopt a less pro-cyclical, or even counter-cyclical, lending behaviour because of a credit smoothing role (Micco and Panizza, 2006; Bertay et al., 2015; Behr et al., 2017).

To analyse the cyclical lending behaviour of banks in Africa, we measure the sensitivity of bank lending growth to GDP per capita growth of the host country on a panel of 230 commercial banks in 38 African countries during the period 2002 to 2015. To control for potential endogeneity issues, we resort to dynamic GMM estimations (Arellano and Bover, 1995; Blundell and Bond, 1998). In addition, we analyse the sensitivity of foreign banks' lending to the home business cycle. We thus estimate the sensitivity of foreign banks' lending growth to GDP per capita growth of the home country. Such issue matters as transmission shocks can occur through cross-border banking.

Our first main result is that banks in Africa adopt a pro-cyclical lending behaviour, no matter the ownership structure. However, Pan-African banks seem to adopt a less cyclical behaviour than other banks. Moreover, foreign banks' lending growth is sensitive to home GDP per capita growth, but such result is less robust than for the sensitivity to host GDP per capita

⁸ Co-written with Laurent Weill, currently revised and resubmitted in Emerging Markets Review.

growth. We can thus conclude that foreign banks entry does not lead to an increase in lending cyclicity but rather to a reduction of this behaviour thanks to Pan-African banks' expansion.

The third and fourth chapters analyse financial inclusion in Africa. The third chapter⁹ introduces the topic by studying the determinants of financial inclusion of African households. The basic way to measure financial inclusion is to utilize bank account ownership. Once an individual owns an account at a formal financial institution, he can realize payments and transfers, save money and contract a loan.

To help building policies to promote financial inclusion, we study the microeconomic determinants of financial inclusion by analysing the impact of gender, age, income and education on three indexes of financial inclusion: formal account ownership, formal saving and formal credit. To do so, we realize probit estimations using the comprehensive World Bank Global Findex database on 37 African countries in 2014. We also study the impact of individual characteristics on barriers to financial inclusion, on mobile banking, on saving motivations and on loan-taking motivations. Finally, we analyse how individual characteristics differently influence the use of informal finance through informal saving and informal borrowing.

Our results show that being a male, wealthier, more educated and older to a certain extent increases the probability of being financially included. Moreover, education and income play a key role while gender is less influential, and even non-influential regarding formal credit.

Regarding barriers to financial inclusion, we find that women seem to be financially excluded because of cultural reasons while characteristics of the banking system play a less significant role for them. Moreover, all barriers to financial inclusion are less important when people are more educated. Concerning mobile banking, we show that microeconomic characteristics influence the probability of having a mobile account in the same direction as other indexes of financial inclusion. Thus, mobile banking does not help reducing the gender gap in access to finance as we could have expected from this new innovative tool.

The fourth chapter¹⁰ analyses the link between bank ownership and financial inclusion. This last chapter allows us to combine the work of our three previous chapters. The idea is once

⁹ Co-written with Laurent Weill, published in *Review of Development Finance* (2016).

¹⁰ Co-written with Florian Léon.

again to check whether foreign banks presence influences financial inclusion and how. Moreover, as previously, we separate foreign banks according to their home country in order to analyse the specific impact of Pan-African banks on financial inclusion. Indeed, as regional foreign banks, PABs may use more soft information than non-regional foreign banks thanks to more proximity between host and home countries.

Probit estimations are used to assess the impact of foreign banks on financial inclusion of both firms and households. To control for potential endogeneity issues, an instrumental variable approach is realized. We combine a sample of 230 banks with the World Bank Enterprise Surveys for the period 2006-2014 for firms and with the World Bank Global Findex database in 2008 and 2014 for households. In our additional work, we study the impact of foreign banks and the specific influence of PABs on barriers to financial inclusion.

Our results indicate that Pan-African banks have a positive and robust influence on firms' access to credit while a less robust impact is observed for households. We explain this result by the fact that PABs benefit from both their foreign bank status with higher expertise and their regional bank status with cultural, institutional and geographical proximity. They would thus resort more to soft information than non-regional foreign banks. Moreover, we also document that PABs increase trust in the banking system and seem to require less strict procedures.

References

- African Economic Outlook 2018. African Development Bank Group.
- Allen, F., Otchere, I., Senbet, L.W., 2011. African Financial Systems: A Review. *Review of Development Finance* 1, 79 – 113.
- Andrianova, S., Baltagi, B., Demetriades, P., Fielding, D., 2015. Why Do African Banks Lend so Little? *Oxford Bulletin of Economics and Statistics* 77, 0305–9049.
- Arellano, M., Bover, O., 1995. Another Look at the Instrumental-Variable Estimation of Error-Components. *Journal of Econometrics* 68, 29–52.
- Arena, M., Reinhart, C., Vázquez, F., 2007. The Lending Channel in Emerging Economies: Are Foreign Banks Different? (IMF Working Paper). International Monetary Fund, Washington, DC.
- Barajas, A., Steiner, R., Salazar, N., 2000. The Impact of Liberalization and Foreign Investment in Colombia's Financial Sector. *Journal of Development Economics* 63, 157–196.
- Beck, T., Brown, M., 2015. Foreign Bank Ownership and Household Credit. *Journal of Financial Intermediation* 24, 466–486.
- Beck, T., Cull, R., 2015. Banking in Africa, in: *The Oxford Handbook of Banking*, Oxford University Press. Allen N. Berger, Philip Molyneux and John O.S. Wilson, pp. 913 – 937.
- Beck, T., Demirgüç-Kunt, A., 2006. Small and Medium-Size Enterprises: Access to Finance as a Growth Constraint. *Journal of Banking and Finance* 30, 2931–2943.
- Beck, T., Demirgüç-Kunt, A., Levine, R., 2007. Finance, Inequality and the Poor. *Journal of Economic Growth* 12, 27–49.
- Beck, T., Demirgüç-Kunt, A., Martínez Pería, M.S.M., 2008. Banking Services for Everyone? Barriers to Bank Access and Use Around the World. *The World Bank Economic Review* 22, 397–430.
- Beck, T., Fuchs, M., Singer, D., Witte, M., 2014. Making Cross-Border Banking Work for Africa. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and International Bank for Reconstruction and Development / The World Bank.
- Beck, T., Levine, R., 2004. Stock Markets, Banks, and Growth: Panel Evidence. *Journal of Banking and Finance* 28, 423–442.
- Beck, T., Levine, R., Loayza, N., 2000. Finance and the Sources of Growth. *Journal of Financial Economics* 58, 261–300.
- Beck, T., Martínez Pería, M.S., 2010. Foreign Bank Participation and Outreach: Evidence from

- Mexico. *Journal of Financial Intermediation* 19, 52–73.
- Beegle, K., Christiaensen, L., Dabalen, A., Gaddis, I., 2016. Poverty in a Rising Africa (Africa Poverty Report). The World Bank, Washington, DC.
- Behr, P., Foos, D., Norden, L., 2017. Cyclicalities of SME Lending and Government Involvement in Banks. *Journal of Banking and Finance* 77, 64–77.
- Berger, A.N., DeYoung, R., Genay, H., Udell, G.F., 2000. The Globalization of Financial Institutions: Evidence from Cross-Border Banking Performance. *Brookings-Wharton Papers on Financial Services* 3, 23–125.
- Berger, A.N., Hasan, I., Zhou, M., 2009. Bank Ownership and Efficiency in China: What Will Happen in the World's Largest Nation? *Journal of Banking and Finance* 33, 113–130.
- Bertay, A.C., Demirgüç-Kunt, A., Huizinga, H., 2015. Bank Ownership and Credit over the Business Cycle: Is Lending by State Banks Less Procyclical? *Journal of Banking and Finance* 50, 326 – 339.
- Blundell, R., Bond, S., 1998. Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. *Journal of Econometrics* 87, 115–143.
- Bonaccorsi di Patti, E., Hardy, D.C., 2005. Financial Sector Liberalization, Bank Privatization, and Efficiency: Evidence from Pakistan. *Journal of Banking and Finance* 29, 2381–2406.
- Bonin, J.P., Iftekhar, H., Wachtel, P., 2005. Bank Performance, Efficiency and Ownership in Transition Countries. *Journal of Banking and Finance* 29, 31 – 53.
- Bonin, J.P., Louie, D., 2016. Did Foreign Banks Stay Committed to Emerging Europe During Recent Financial Crisis? *Journal of Comparative Economics* Article in press, 1–16.
- Bourguignon, F., 2015. Thoughts on Development: The African Experience, in: *The Oxford Handbook of Africa and Economics*. Volume 1: Context and Concepts. Célestin Monga and Justin Yifu Lin.
- Bruno, V., Hauswald, R., 2013. The Real Effect of Foreign Banks. *Review of Finance* 18, 1683–1716.
- Chen, C., 2009. Bank Efficiency in Sub-Saharan African Middle-Income Countries (Working Papers 09/14). International Monetary Fund, Washington, DC.
- Claessens, S., Demirgüç-Kunt, A., Huizinga, H., 2001. How Does Foreign Entry Affect Domestic Banking Markets? *Journal of Banking and Finance* 25, 891–911.
- Claessens, S., Van Horen, N., 2014a. Foreign Banks: Trends and Impacts. *Journal of Money, Credit and Banking* 46, 295–326.
- Claessens, S., Van Horen, N., 2014b. Location Decisions of Foreign Banks and Competitor

- Remoteness. *Journal of Money, Credit and Banking* 46, 145–170.
- Clarke, G.R.G., Cull, R., Martínez Pería, M.S., 2006. Foreign Bank Participation and Access to Credit Across Firms in Developing Countries. *Journal of Comparative Economics* 34, 774–795.
- De Haas, R., van Lelyveld, I., 2010. Internal Capital Markets and Lending by Multinational Bank Subsidiaries. *J. Finan. Intermediation* 19, 1–25.
- Demirgüç-Kunt, A., Klapper, L., 2013. Measuring Financial Inclusion: Explaining Variation in Use of Financial Services Across and Within Countries. *Brookings Papers on Economic Activity* 279–321.
- Dethier, J.-J., 2015. Infrastructure in Africa, in: *The Oxford Handbook of Africa and Economics*. Volume 1: Context and Concepts. Célestin Monga and Justin Yifu Lin.
- Detragiache, E., Tressel, T., Gupta, P., 2008. Foreign Banks in Poor Countries: Theory and Evidence. *The Journal of Finance* 63, 2123–2160.
- DeYoung, R., Nolle, D., 1996. Foreign-Owned Banks in the United States: Earning Market Share or Buying It? *Journal of Money, Credit and Banking* 28, 622–636.
- Enoch, C., Mathieu, P., Mecagni, M., 2015. Pan-African Banks. Opportunities and Challenges for Cross-Border Oversight. International Monetary Fund, Washington, D.C.
- Figueira, C., Nellis, J., Parker, D., 2009. The Effects of Ownership on Bank Efficiency in Latin America. *Applied Economics* 41, 2353–2368.
- Fosu, S., 2013. Banking Competition in Africa: Sub-Regional Comparative Studies. *Emerging Markets Review* 15, 233 – 254.
- Fries, S., Taci, A., 2005. Cost Efficiency of Banks in Transition: Evidence from 289 Banks in 15 Post-Communist Countries. *Journal of Banking and Finance* 29, 55-81.
- Fungáčová, Z., Herrala, R., Weill, L., 2013. The Influence of Bank Ownership on Credit Supply: Evidence from the Recent Financial Crisis. *Emerging Markets Review* 15, 136–147.
- Giannetti, M., Ongena, S., 2012. “Lending by Example”: Direct and Indirect Effects of Foreign Banks in Emerging Markets. *Journal of International Economics* 86, 167–180.
- Gormley, T.A., 2010. The Impact of Foreign Bank Entry in Emerging Markets: Evidence from India. *Journal of Financial Intermediation* 19, 26–51.
- Gulati, R., Kumar, S., 2016. Assessing the Impact of the Global Financial Crisis on the Profit Efficiency of Indian Banks. *Economic Modelling* 58, 167–181.
- Hauer, D., Peiris, S.J., 2008. Banking Efficiency and Competition in Low Income Countries: the Case of Uganda. *Applied Economics* 40, 2703–2720.

- Iwanicz-Drozdowska, M., Witkowski, B., 2016. Credit Growth in Central, Eastern, and South-Eastern Europe: The Case of Foreign Bank Subsidiaries. *International Review of Financial Analysis* 43, 146–158.
- Kablan, S., 2007. Measuring Bank Efficiency in Developing Countries: the Case of WAEMU (West Africa Economic Monetary Union). African Economic Research Consortium.
- Kalemli-Ozcan, S., Papaioannou, E., Perri, F., 2013. Global Banks and Crisis Transmission. *Journal of International Economics* 89, 495–510.
- Karas, A., Schoors, K., Weill, L., 2010. Are Private Banks More Efficient than Public Banks? Evidence from Russia. *Economics of Transition* 18, 209–244.
- Kirpatrick, C., Murinde, V., Tefula, M., 2008. The Measurement and Determinants of X-Inefficiency in Commercial Banks in Sub-Saharan Africa. *European Journal of Finance* 14, 625–639.
- Léon, F., 2016. Does the Expansion of Regional Cross-Border Banks Affect Competition in Africa? Indirect Evidence. *Research in International Business and Finance* 37, 66–77.
- Levine, R., Loayza, N., Beck, T., 2000. Financial Intermediation and Growth: Causality and Causes. *Journal of Monetary Economics* 46, 31–77.
- Levine, R., 2005. Finance and Growth: Theory and Evidence, in: *The Handbook of Economic Growth*. Volume 1A. Ed. Aghion, P., Durlauf, S.N., Elsevier, Amsterdam.
- Mecagni, M., Marchettini, D., Maino, R., 2015. Recent Trends in Banking in Sub-Saharan Africa: from Financing to Investment. The European Investment Bank.
- Mian, A., 2006. Distance Constraints: The Limits of Foreign Lending in Poor Economies. *The Journal of Finance* 61, 1465–1505.
- Micco, A., Panizza, U., 2006. Bank Ownership and Lending Behaviour. *Economics Letters* 93, 248–254.
- Mlachila, M., Dykes, D., Zajc, S., Aithnard, P.-H., Beck, T., Ncube, M., Nelvin, O., 2013. Banking in Sub-Saharan Africa: Challenges and Opportunities. The European Investment Bank.
- Ncube, M., 2015. Inclusive Growth in Africa, in: *The Oxford Handbook of Africa and Economics*. Volume 1: Context and Concepts. Célestin Monga and Justin Yifu Lin.
- Nyantakyi, E.B., Sy, M., 2015. The Banking System in Africa: Main Facts and Challenges (Chief Economist Complex No. 6). African Development Bank Group.
- Okeahalam, C.C., 2008. Internationalization and Firm Performance: Evidence from Estimates of Efficiency in Banking in Namibia and Tanzania. *Journal of International Development* 20, 942–964.

- Popov, A., Udell, G., 2012. Cross-Border Banking, Credit Access, and the Financial Crisis. *Journal of International Economics* 87, 147–161.
- Sathye, M., 2001. X-Efficiency in Australian Banking: An Empirical Investigation. *Journal of Banking and Finance* 25, 613–630.
- Van Horen, N., 2007. Foreign Banks in Developing Countries: Origin Matters. *Emerging Markets Review* 8, 81–105.
- Wanke, P., Barros, C.P., Emrouznejad, A., 2016. Assessing Productive Efficiency of Banks using Integrated Fuzzy-DEA and Bootstrapping: A case of Mozambican Banks. *European Journal of Operational Research* 249, 378–389.
- Yeyati, E.L., Micco, A., 2007. Concentration and Foreign Penetration in Latin American Banking Sectors: Impact on Competition and Risk. *Journal of Banking and Finance* 31, 1633–1647.
- Weill, L., 2003. Banking Efficiency in Transition Economies: The Role of Foreign Ownership. *Economics of Transition* 11, 569–592.

Chapter 1¹¹

Do Pan-African Banks Have the Best of Both Worlds?

Abstract

There has been a large expansion of foreign banks in Africa over the two decades with Pan-African banks playing a key role in this phenomenon. This paper questions if this development is beneficial for bank efficiency in African countries by investigating if Pan-African banks are more efficient than other types of foreign banks and domestic banks. We analyse the relation between ownership type and bank efficiency on a large sample of African banks covering 39 African countries over the period 2002-2015. We find that Pan-African banks are the most efficient banks in African banking industries. We explain this finding by the fact that these banks combine the best of both worlds: they have the global advantages of foreign banks and the home field advantages of domestic banks. They are then able to be more efficient than foreign banks from developed countries but also than domestic banks. This suggests that favouring entry of Pan-African banks would be beneficial to bank efficiency in Africa.

JEL Codes: G21, G32, N27.

Keywords: Africa, Bank, Efficiency, Ownership.

¹¹ This chapter refers to the article revised and resubmitted in Economic Systems with Laurent Weill.

1.1. Introduction

There has been a large expansion of foreign banks in Africa over the last two decades. According to Beck et al. (2014), the number of cross-border banks present on the continent increased from 120 in 1995 to 227 in 2009. Liberalization and privatization reforms enforced on the continent associated with increased integration of Africa in international trade have contributed to favour this evolution.

This trend is comparable to what has been observed in other emerging and developing countries, such as European transition countries and Latin American countries in the 90s. However, foreign bank expansion in Africa presents a major difference. While the development of foreign banks in other regions of the world has been fuelled by banks from developed countries, in Africa it associates foreign banks from countries of the same continent with Pan-African banks (PABs).

PABs are banks headquartered in African countries that expand their activities on the African continent. Their expansion has mainly occurred since the mid-2000s leading to a very important role in African banking systems today. They are present in 36 African countries, with the seven major PABs having activities in at least ten African countries (Enoch, Mathieu and Mecagni, 2015).

The expansion of PABs raises major questions about its consequences on bank efficiency. Literature on the relation between foreign bank ownership and bank efficiency has shown that this link can vary with the country of origin of the foreign bank. Berger et al. (2000) propose two hypotheses to explain this relation. Under the home field advantage hypothesis, domestic banks are more efficient than foreign banks because they have informational advantages relative to their foreign counterparts. Their better knowledge of the local customers and environment gives them an advantage. Under the global advantage hypothesis, foreign banks would be more efficient than domestic banks since they would benefit from lower costs thanks to their better management abilities and best-practice policies.

Therefore, foreign banks would be more efficient in developing and emerging countries since they come from developed countries with better expertise, which would dominate the informational advantage of domestic banks (Berger, Hasan and Zhou, 2009; Karas, Schoors and Weill, 2010). But foreign banks would be less efficient in developed countries, since then

domestic banks would not suffer from a disadvantage in such expertise (DeYoung and Nolle, 1996; Sathye, 2001).

The aim of this study is to examine whether PABs are more efficient than other types of banks in African countries. While a few studies have measured efficiency of banks in Africa (e.g., Hauner and Peiris, 2008; Kirkpatrick, Murinde and Tefula, 2008), no work has ever investigated this question. Our hypothesis is that PABs can combine the best of both worlds. On the one hand, they have the global advantages of foreign banks by working on a broader scale and by having better expertise from larger experience. As a consequence, they have greater efficiency than domestic banks. On the other hand, Pan-African banks have the local advantages of domestic banks with a better knowledge of local customers and environment. Their managers would have a better appraisal of the institutional framework and of the way banking activities take place in African countries, making the Pan-African banks the most efficient.

To investigate this issue, we measure cost efficiency on a large sample of African banks covering 39 African countries over the period 2002-2015. All ownership types of banks observable in Africa are considered: Pan-African banks, foreign banks from developed economies, foreign banks from developing countries, domestic private banks, and domestic state-owned banks. We analyse the relation between bank ownership and cost efficiency via the one-step stochastic frontier model proposed by Battese and Coelli (1995). This model is commonly adopted in studies comparing bank efficiency by ownership in developing and emerging countries (e.g., Fries and Taci, 2005; Karas, Schoors and Weill, 2010).

We find that PABs are the most efficient banks in African banking industries. They benefit from higher efficiency in comparison to domestic banks but also to foreign banks originating from developed or developing countries. This conclusion is explained by the fact that these banks have the best of both worlds. They have the global advantage relative to domestic banks because of their broader scale and the home field advantage relative to foreign banks thanks to a better knowledge of local environment.

Our contribution is twofold. First, we help understanding the implications of the expansion of PABs which are still understudied. Few studies have been done to examine how the development of PABs can influence African banking systems, exceptions being Kodongo, Natto and Biekpe (2015) on the drivers of cross-border bank expansion in East Africa, Beck

(2015) on the impact of the forms of foreign banks on access to finance for firms in Africa and Léon (2016) on the link between PABs and bank competition in the WAEMU region. By providing the first study on the efficiency impact of PABs, we bring information for policymakers to favour or discourage this expansion. Second, we contribute to the literature on foreign ownership and bank efficiency by analysing the case of PABs. By studying whether PABs can combine global and local advantages to dominate domestic and other foreign banks in terms of efficiency, we add to the debate on both hypotheses pioneered by Berger et al. (2000).

The paper is organized as follows. Section 2 provides the background of the research question. Section 3 presents data and methodology. Section 4 reports the results. Section 5 provides concluding remarks.

1.2. Background

1.2.1. Cross-border banking in Africa

Foreign-owned banks presence across the African continent has almost doubled over the past decades, increasing from 120 to 227 cross-border banks over the period 1995 to 2009 (Beck et al., 2014).

A first type of foreign banks concerns the ones from developed countries. For historical and economic reasons, European groups are concentrated in Anglophone countries for British banks like Standard Chartered, Francophone countries for French banks like Société Générale, and Lusophone countries for Portuguese banks like Caixa Geral de Depósitos. A second type of foreign banks comes from emerging countries with the presence of banks from China, India, Bahrain, or Pakistan. Their presence on African banking markets is a recent phenomenon.

A third type of foreign banks is PABs, which are financial institutions headquartered in African countries. This expansion has started in the 1990s but the most part of this trend has occurred since the mid-2000s. The expansion of PABs takes place through subsidiaries, with the parent bank providing a common framework – for risk sharing and internal audit for example – and centralized services – such as information technologies or centralized treasury. Most PABs resort to stand-alone subsidiaries with limited integration across affiliate networks

or with parent banks in order to bring about an “indigenization” process (Beck et al., 2014). Thus, PABs are integrated but use local IT functions, local labour and local management functions. Arising from their home markets, PABs generally spread their activities first to neighbouring economies, then across the region and, for some of them, even across the continent and beyond (Beck et al., 2014). Push and pull factors explain this expansion.

Push factors are events and circumstances in the home country that drive banks to move beyond their borders. In South Africa, the end of the apartheid increased the potential for South African banks to expand abroad. In Kenya, the innovations and the increased depth of the Kenyan market allowed banks to broaden their activities across East Africa. In Nigeria, the regulatory changes increased the capabilities of banks to expand abroad.

Pull factors are opportunities in host countries that encourage a bank to expand abroad. First, economic integration favours cross-border banking. Second, the reduced presence of foreign banks from developed countries following the 2007 crisis has opened opportunities for PABs. This has been illustrated with the acquisition of French bank *Crédit Agricole*’s banking network in five Western African countries in 2008 by the Moroccan bank *Attijariwafa*. A final factor has been the fact that cross-border banking has been eased thanks to the liberalization that occurred in the late 1980s and early 1990s among the continent.

Research remains however very limited on the expansion of PABs. Kodongo, Natto and Biekpe (2015) examine the drivers of cross-border bank expansion in East Africa. They analyse the factors pushing Kenyan banks to expand in three neighbouring countries (Rwanda, Tanzania, and Uganda) and conclude that Kenyan banks expand abroad because of their deeper home financial markets and their more efficient operations, while the follow-the-client hypothesis does not play a role. Macroeconomic factors of the host country exert an impact on the decision to expand abroad with a positive influence of institutional quality and a negative influence of inflation perceived as a signal of macroeconomic instability.

In his investigation of bank competition in seven Western African countries, Léon (2016) shows that competition has increased over the period 2002-2009 coinciding with the rapid expansion of African banking groups and the relative decline of incumbent foreign banks from developed countries.

Beck (2015) examines the impact of cross-border banking on access to finance for firms using data on 29 African countries. He considers separately the three different forms of foreign banks in African countries (PABs, from developing countries, from developed countries). He finds that greater market shares of PABs and of foreign banks from developing countries have a positive relation with access to finance while the relation is negative with the market share of foreign banks from developed countries.

Pelletier (2018) provides a recent comparison of performance between the three different forms of foreign banks in African countries and domestic banks. She measures performance with two ratios: return on equity, and cost-to-income ratio. She finds that PABs are less profitable and have greater costs than foreign banks from developed countries. In addition, she does not find clear difference in performance between PABs and domestic banks.¹²

1.2.2. Bank ownership and efficiency

The influence of foreign ownership on bank efficiency has been extensively tackled in the literature. We present the main results of this debate by distinguishing geographic areas.

First, a bunch of works has been done in European transition countries in which foreign banks have gradually reached a large market share during the 90s. These studies conclude to better cost efficiency of foreign banks relative to domestic banks (Weill, 2003; Yildirim and Philippatos, 2003; Bonin, Hasan and Wachtel, 2005; Fries and Taci, 2005; Karas, Schoors and Weill, 2010).

Second, studies on emerging countries from Asia and Latin America tend to find greater efficiency for foreign banks. In China, Berger, Hasan and Zhou (2009) conclude that foreign banks are more cost and profit efficient than all types of domestic banks. In India, Gulati and Kumar (2016) observe that foreign banks are more profit efficient than domestic banks. In Pakistan, Bonaccorsi di Patti and Hardy (2005) find that domestic state-owned banks are less efficient than domestic private banks and foreign banks, while privatized domestic banks can outperform foreign banks. Figueira, Nellis and Parker (2009) do not find significant differences

¹² Two recent studies have also shown that the presence of information sharing offices has a different impact on the behavior of foreign vs domestic banks in Africa (Asongu, 2017; Boateng et al., 2018).

between foreign and domestic banks for a sample of 20 Latin American countries. Barros and Wanke (2014) also conclude to the lack of a significantly different efficiency level for state-owned banks and foreign banks relative to private banks in Brazil.

Third, no consensus tends to emerge from the scarce literature on Africa regarding the most efficient ownership type of banks. In a study on six Western African countries over the period 1996-2004, Kablan (2007) finds that domestic private banks are more cost efficient than foreign banks, which outperform domestic state-owned banks. But Okeahalam (2008), using data for 1998-2003 for two African countries, concludes that foreign banks are less cost efficient than domestic banks in Namibia while they are more cost efficient than domestic banks in Tanzania. However, Chen (2009) concludes that foreign banks are more efficient than domestic private and state-owned banks in ten Sub-Saharan African middle-income countries over the period 2000–2007. Similarly, Hauner and Peiris (2008) find that foreign banks are more efficient than any other bank type in Uganda over the period 1999–2004. Additionally, Kirpatrick, Murinde and Tefula (2008) find that foreign bank entry enhances efficiency in a study on nine Anglophone African countries over the period 1992–1999.

Fourth, domestic banks tend to outperform foreign banks in developed countries. Overall the question of foreign ownership of banks is less studied in developed countries given the lower presence of foreign banks in these countries relative to developing and emerging countries. DeYoung and Nolle (1996) in the US and Sathye (2001) in Australia find that domestic banks are more efficient than foreign banks. On a global scale, Claessens, Demirgüç-Kunt and Huizinga (2001) find that foreign banks have higher profits and interest margins than domestic banks in developing countries while the opposite is observed in developed countries.

To sum it up, literature tends to show that foreign banks would be more efficient than domestic banks in developing and emerging countries, but less efficient than domestic banks in developed countries. How can these contrasted results be interpreted? Berger et al. (2000) have proposed two key hypotheses on the link between foreign ownership and bank efficiency which can provide an explaining pattern: the home field advantage hypothesis versus the global advantage hypothesis. Under the home field advantage hypothesis, domestic banks are more efficient than foreign banks since they have informational advantages. Foreign banks can endure various managerial costs such as hard monitoring from abroad and high costs in persuading managers to work out of the country. Thus, managerial efficiency may be more complicated to ensure. Foreign banks can also suffer from having difficulties to build deposit

and lending relationships with local clients. They can require more information and suffer from barriers due to country-specific characteristics, such as language, culture, law enforcement, currency, regulatory and supervisory frameworks, etc.

Under the global advantage hypothesis, foreign banks are more efficient than domestic banks and would be able to overcome the cross-border drawbacks mentioned above. They would succeed in lowering their costs by expanding abroad their superior management abilities and best-practice policies. They would also resort to better risk management expertise and would be able to reach customers with superior service quality and diversity.

Therefore, in developing countries, the global advantage hypothesis can play a greater role given the better expertise of foreign banks from developed countries, while the home field advantage hypothesis can be more relevant in developed countries in which domestic banks do not suffer from lower expertise in comparison to foreign banks.

The impact of state-ownership on bank efficiency has also been studied in the literature. From a theoretical perspective, we find two theories explaining why state-owned banks might be less efficient than privately-owned banks. Under the principal-agent theory, managers have greater incentives to maximize profits in the private sector than in the public sector because private investors are better monitors of their behaviour than civil servants (Rowthorn and Chang, 1993; Boycko, Shleifer and Vishny, 1996). Under the public choice theory, government agents and civil servants would be motivated by electoral goals and their own interests. Such attitude leads to waste and inefficiencies (Stigler, 1971; Shleifer and Vishny, 1994, 1998).

However, studies measuring state-owned banks' efficiency do not lead to the same conclusion. In their global study, Lensink, Meesters and Naaborg (2008) find that state-owned banks are generally less efficient than non-state-owned banks. In transition countries, Karas, Schoors and Weill (2010) do not find any cost efficiency difference between domestic private and domestic state-owned banks in Russia, whereas Bonin, Hasan and Wachtel (2005) find that state-owned banks are least cost and profit efficient in six transition countries. In developing countries, Bonaccorsi di Patti and Hardy (2005) find that state-owned banks are the least efficient in Pakistan. Berger, Hasan and Zhou (2009) also conclude that Chinese state-owned Big Four banks are the least efficient. However, Bhattacharya, Lowell and Sahay (1997) find that Indian state-owned banks have been the most efficient, followed by foreign banks and

domestic private banks. Figueira, Nellis and Parker (2009) do not find significant differences between private and state-owned banks in Latin America.

Third, studies in Africa mainly conclude that privatization leads to efficiency improvements. Kablan (2007) concludes that state-owned banks are the least efficient ones in six WAEMU countries. Profitability and portfolio quality increased after the privatization of Tanzania's National Bank of Commerce (Cull and Spreng, 2011) while ROE increased and NPLs decreased in Nigeria, indicating performance improvements thanks to the privatization program launched in the early 1990s (Beck, Cull and Jerome, 2005). The privatization of Uganda Commercial Bank (UCB) to the South Pan-African bank Stanbic led to profitability improvement while no outreach deterioration was observed (Clarke, Cull and Fuchs, 2009). Finally, Omran (2007) finds that reducing state presence in banks is related to higher performance in Egypt.

From this literature, we can extract hypotheses on efficiency of banks in African countries. First, we assume that foreign banks are more efficient than domestic banks. In Africa, the global advantage hypothesis should have the upper hand over the home field advantage hypothesis in line with what has been found in studies in developing and emerging countries.

Second, our key hypothesis is that PABs are more efficient than other types of foreign banks. On the one hand, they have the global advantages of foreign banks by working on a broader scale and by having better expertise from larger experience. As a consequence, they have greater efficiency than domestic banks. On the other hand, PABs have the local advantages of domestic banks with a better knowledge of local customers and environment in comparison to other foreign banks. Their managers have a better knowledge of the institutional framework and of the way banking activities take place in African countries, which makes them suffer less than other types of foreign banks from informational disadvantages. Among others, PABs share a lot of similar characteristics like cultural features, language but also legal characteristics and even currency for economic communities. Thus, PABs can also benefit from the home field advantage. In a nutshell, PABs would then combine the best of both worlds to be the most efficient banks in African banking systems.

1.3. Econometric framework

1.3.1. Methodology

In this work, we measure cost efficiency of banks. Cost efficiency measures how close a bank's cost is to its optimal cost when producing the same bundle of outputs. Distance from an efficient cost frontier can be measured using a non-parametric technique such as Data Envelopment Analysis (DEA) or a parametric technique such as the stochastic frontier approach. In our study, we resort to the stochastic frontier approach to measure cost efficiency for African banking industries as it has been widely used to estimate cost efficiency scores in the literature on foreign ownership and bank efficiency (e.g., Berger, Hasan and Zhou, 2009; Karas, Schoors and Weill, 2010). The main advantage, compared to a non-parametric approach, is in separating inefficiencies from external random shocks or data measurement errors.

Two approaches are proposed in the literature to study determinants of banking efficiency. The two-step approach, which involves first the estimation of the cost frontier, predicts efficiency by decomposing the error term between its random and inefficiency components. The second step is the regression of efficiency scores on a set of explanatory variables. This approach entails two econometric problems. First, the first step assumes that the inefficiency terms are identically distributed, whereas the second-step regression assumes that the distributions of inefficiency terms are conditional on a set of explanatory variables. Second, including explanatory variables in a second-step regression means that the first-step frontier estimation might suffer from omitted variables bias if the explanatory variables are correlated with the variables of the cost frontier model.

Hence, we use the 'one-step approach' proposed by Battese and Coelli (1995) for panel data, which solves these issues. This approach consists of estimating a model that includes the cost frontier and the equation modelling the inefficiency term as a function of several explanatory variables. The general framework can be expressed as:

$$TC_{it} = f(Y_{it}, P_{it}) + \varepsilon_{it} \quad (1)$$

where TC_{it} represents total cost for bank i at time t , Y_{it} is the vector of outputs, P_{it} the vector of input prices, and ε_{it} the error term. The error term is the sum of a random error component v_{it} , representing external shocks or data measurement errors, and a positive cost-inefficiency term u_{it} . The v_{it} is assumed to be i.i.d and normally distributed with mean 0 and standard

deviation σ_v^2 . u_{it} follows a truncated normal distribution (at zero) with mean $z_{it}\delta$ and standard deviation σ^2 , where z_{it} is a vector of explanatory variables associated with bank inefficiency over time and δ is a vector of parameters to be estimated. Consequently, the u_{it} are independently but not identically distributed, as they are each expressed as a function of z_{it} :

$$u_{it} = z_{it}\delta + W_{it} \quad (2)$$

where W_{it} is a random variable defined by the truncation of the $N(0, \sigma^2)$ distribution, with the point of truncation $-z_{it}\delta$. The coefficients in equations (1) and (2) are then estimated simultaneously using the method of maximum likelihood.

We adopt the intermediation approach for the specification of inputs and outputs which is widely chosen in the literature (Bonaccorsi di Patti and Hardy, 2005; Hauner and Peiris, 2008; Chen, 2009). This approach considers that the bank collects deposits to transform them with labour and capital into loans. We consider two outputs: total loans and other earning assets. The inputs, whose prices are used to estimate the cost frontier, include labour, physical capital, and borrowed funds. Since data on the number of employees are not available, the price of labour is defined as the ratio of personnel expenses to total assets following Karas, Schoors and Weill (2010). The price of physical capital is measured by the ratio of other non-interest expenses to fixed assets. The price of borrowed funds is defined as the ratio of paid interests to deposits and short-term funding. Total cost is the sum of personnel expenses, other non-interest expenses, and paid interests. Following Berger, Hasan and Zhou (2009), we employ a translog form to model the cost function of banks.

The cost frontier is given by:

$$\begin{aligned} \ln TC = & \beta_0 + \sum_m \alpha_m \ln y_m + \sum_n \beta_n \ln w_n + \frac{1}{2} \sum_m \sum_j \alpha_{mj} \ln y_m \ln y_j \\ & + \frac{1}{2} \sum_n \sum_k \beta_{nk} \ln w_n \ln w_k + \sum_n \sum_m \gamma_{nm} \ln w_n \ln y_m + \varepsilon \end{aligned} \quad (3)$$

where TC is total costs (computed as the sum of interest expenses, personnel expenses, and other operating expenses), y_m is the m^{th} bank's output ($m=1,2$), w_n is the n^{th} input price ($n=1,2$), and w_3 is the price of borrowed funds. For simplicity of presentation, the indices for each bank have been dropped. We consider several specifications of the cost frontier in the estimations.

The basic one is as presented before, while we test the inclusion of year dummy variables and of country-specific variables to control for the evolution of technology over time and the influence of macroeconomic environment. By including country-specific variables in the cost frontier, we take into account the possible cross-country differences in the cost frontier.

Following Fries and Taci (2005) among others, we use the Battese and Coelli (1995) model first to compute cost efficiency scores for each type of banks and each year. This way, we can compare efficiency by ownership type and consider the evolution over time of efficiency. In that case, the second equation of the model does not include tested determinants. We then include determinants in the second equation to analyse the relation between ownership type and efficiency.

1.3.2. Data and variables

The sample includes 248 banks covering 39 African countries over the period 2002–2015, which represents 2,196 observations. Unconsolidated accounting data come from the Bankscope database issued by Bureau van Dijk. Ownership information is collected from Bankscope database and from banks' websites and newspaper releases. We then build a comprehensive database that gives the ownership structure of each bank of the panel for every year.

Table 1.1. gives the composition of the sample by bank type for each country. For a total of 248 banks in our sample, 67 banks are Pan-African, 55 are non-African foreign banks from developed countries, 22 are foreign banks from developing countries, 90 are domestic privately-owned and 30 are domestic publicly-owned.

A bank is considered as foreign when the majority of the shares is controlled by foreign companies or when a foreign organization is the first shareholder and the rest of the shares are divided between several shareholders. The same definition is used for the other ownership types. We have five ownership types in our sample, corresponding to five dummies: *Pan African Bank*, *Foreign Developed*, *Foreign Developing*, *Domestic Private* and *Domestic Public*. Table 1.2. provides additional information on Pan-African banks in the sample by mentioning their home country and their host countries in Africa.

Table 1.3. displays descriptive statistics for variables considered in the estimation of cost efficiency scores for the full sample while Table 1.4. provides this information by ownership type. In terms of total assets, domestic banks – both private and public – are larger than foreign banks in Africa. PABs have the smallest mean of total assets.

We include four control variables in the equation explaining inefficiency. We consider bank-specific variables which can also influence inefficiency and whose omission can bias the investigation of the relation between ownership and inefficiency. Following Berger, Hasan and Zhou (2009), we consider bank size through two dummy variables. *Medium Bank* is equal to one if the bank ranges between the 25th and the 75th percentile of total assets of the sample and zero otherwise. *Large Bank* is equal to one if the bank has a size above the 75th percentile of total assets. *Loans to Other Earning Assets* is the ratio of loans to investment assets which allows controlling for the asset mix. *Bank Soundness* is the ratio of equity to total assets.

We include four country-level variables in some specifications of the cost frontier to control for the macroeconomic environment. *GDP per Capita*, *Domestic Credit to Private Sector* and *Inflation* are obtained in the World Bank World Development Indicators (WDI). *GDP per Capita* is gross domestic product divided by midyear population and is expressed in current US\$. *Domestic Credit to Private Sector* refers to financial resources provided to the private sector by financial institutions divided by GDP. It measures the level of banking development in the economy. *Inflation* as measured by the consumer price index in annual percent is a proxy for macroeconomic instability. *Rule of Law*, which is a measure for the quality of the institutions, is extracted from the World Bank World Governance Indicators (WGI). The score for *Rule of Law* is between 0 and 10, 0 being the worse score and 10 the best. Finally, in the last two specifications we add *Bank Concentration* as a fifth country-level control variable. *Bank Concentration* is the percent of assets held by the three largest commercial banks as a share of total commercial banking assets and is extracted from the Global Financial Development Database (GFDD). We include bank concentration in the last specifications only since we lose many observations for this variable.

1.4. Results

This section compares the efficiency for the different types of banks. We first present the efficiency scores by ownership type. We then perform a multivariate analysis to study the link between ownership type and bank efficiency.

1.4.1. Efficiency scores by ownership type

Table 1.5. reports the efficiency scores for each ownership type and each year of the period of the sample with significance tests for differences in Table 1.6. We find that the mean cost efficiency score is 77.1% for all African banks, which means that the average African bank produces 77.1% of the maximal production it could have for its level of total cost. This figure is of the same order of magnitude than what has been found in other studies on African banks. Kablan (2007) finds that the mean cost efficiency score in the WAEMU region is 70% in 2004 while Chen (2009) observes an average cost efficiency score ranging from 72.5 to 78 % in ten Sub-Saharan African middle-income countries for the 2000–2007 period with a mean score for the full sample being overall constant over time.

The key finding is the greatest efficiency for PABs relative to all other types of banks. PABs have the highest mean cost efficiency score (79.1%) among all five types of banks over the period. Efficiency of PABs is significantly higher than efficiency of all other types of banks over the period. These results then support the view that Pan-African banks are the most efficient banks since they combine advantages of foreign banks relative to domestic banks and of African banks relative to foreign banks from developed countries.

After PABs, we observe that foreign banks from developed economies (77.6%) are the most efficient. Foreign banks from developing countries have the lowest mean efficiency score (71.9%) which is significantly lower than for all other types of banks. These results tend to indicate that the origin of the foreign shareholder impacts the efficiency of foreign-owned banks.

Interestingly domestic public and private banks have very similar mean efficiency scores with respectively 76.5% and 76.2%. The mean efficiency scores for foreign banks from developed countries, domestic public banks, and domestic private banks over the period are not significantly different.

The finding that domestic state-owned do not have lower efficiency than domestic private banks accords with Karas, Schoors and Weill (2010) in Russia and Figueira, Nellis and Parker (2009) in Latin America who do not find that privately-owned banks perform better than state-owned banks. It nonetheless contrasts with Bonin, Hasan and Wachtel (2005) for European transition countries and Berger, Hasan and Zhou (2009) for China. According to Berger, Hasan and Zhou (2009), government subsidies can in part reduce costs of state-owned banks. Indeed, public banks may benefit from below-market rates on deposits, lower rents for offices or grant-aided equity capital. Such advantages can reduce total costs and explain the positive cost efficiency score of state-owned banks.

1.4.2. Multivariate analysis

The comparison of mean efficiency scores has shown that Pan-African banks are the most efficient banks. We now proceed to a multivariate analysis on efficiency scores to confirm the observed difference in efficiency by controlling for other characteristics which can influence this finding. We perform the Battese and Coelli (1995) model in which inefficiency is explained by a set of variables in the second equation. As a consequence, a minus sign for a tested determinant indicates that an increase in the explanatory variable leads to less inefficiency, or in other words that there is a positive relation between the variable and efficiency.

We provide two tables of estimations in which we consider six specifications to test the robustness of our results. In all six specifications, we include bank-level control variables in the equation explaining inefficiency. The specification (1) only includes the input and output mix in the frontier. The specification (2) adds year dummies in the frontier. The specification (3) adds country-level variables in the frontier but does not include year dummies, and the specification (4) contains year dummies and country-level variables in the frontier. The specification (5) adds *Bank Concentration* as a fifth country-level variable and the specification (6) contains *Bank Concentration*, country-level variables and year dummies.

We first provide estimations comparing foreign banks, domestic state-owned banks, and domestic private banks. We want to check whether foreign banks and domestic banks differ in terms of cost efficiency and whether state-owned banks perform better or worse than their domestic private counterparts. Therefore, we include two dummies for the ownership – *Domestic Private* and *Foreign Bank* – and we omit the dummy *Domestic Public*. The dummy

Foreign Bank covers PABs and banks headquartered in both developed and developing countries. These results are displayed in Table 1.7. Two main conclusions emerge. First, we observe that foreign banks are significantly more efficient than domestic state-owned banks. *Foreign Bank* is significantly negative in all estimations. This means that being a foreign-owned bank reduces cost inefficiency relative to state-owned banks. Managers from foreign banks are more efficient in handling their costs than their domestic public counterparts. In addition, we have also tested the estimations by omitting *Domestic Private* instead of *Domestic Public*, which is not reproduced for conciseness. We also obtain a significant and negative coefficient for *Foreign Bank*, confirming that foreign-owned banks are most efficient than both types of domestic banks.

Our first hypothesis seems to be confirmed: foreign banks perform more efficiently than domestic banks. As the African continent is in the developing world, we expected the global advantage hypothesis to overtake the home field advantage hypothesis. Moreover, Claessens, Demirgüç-Kunt and Huizinga (2001) find that foreign banks have higher profits than domestic banks in developing countries while the opposite occurs in developed economies. Our result is in line with many findings in the developing world and in transition economies (Weill, 2003; Bonin, Hasan and Wachtel, 2005; Berger, Hasan and Zhou, 2009; Chen, 2009; Karas, Schoors and Weill, 2010).

Second, we find that domestic private banks are more efficient than domestic state-owned banks. *Domestic Private* is negative in the four estimations with a significant coefficient in the three last specifications. Managers in privately-owned banks seem to handle costs in a more efficient way than their publicly-owned counterparts. Therefore, the comparison of mean cost efficiency scores suggests that domestic state-owned banks are the least efficient banks relative to foreign and private banks in African banking systems.

The second table of estimations compares all types of banks. It therefore allows analysing if types of foreign banks differ in efficiency. We are then able to test our hypothesis that Pan-African banks are the most efficient banks over the African continent. We include four dummy variables for ownership – *Pan African*, *Foreign Developing*, *Domestic Private* and *Domestic Public* – and we skip *Foreign Developed*. By omitting this latter variable, our estimations allow analysing if a difference exists between Pan-African banks and foreign banks from developed countries, which have been shown to be the most efficient types of banks in the

comparison of efficiency scores. The results are reported in Table 1.8. Several findings are fairly striking.

First, PABs are the most efficient banks. *Pan African* is significantly negative in all six estimations, while no other ownership dummy variable is significantly negative. Therefore, these results show that PABs are the only type of banks being more efficient than foreign banks from developed countries. They confirm our comparative analysis of the mean efficiency scores according to which PABs have the highest average cost efficiency. We thus provide strong evidence supporting our hypothesis that PABs are the most efficient banks in African banking systems.

Our interpretation of this result is that PABs benefit from both the global advantage and the home field advantage. By expanding their activities abroad, PABs have developed higher skills like their counterparts from developed economies. Moreover, PABs resort to an “indigenization” process as suggested by Beck et al. (2014). Their subsidiaries are integrated in the group but are generally separate legal entities in host countries using local labour and local management functions. Thanks to this strategy, they obtain an edge over their foreign counterparts because they do not suffer from informational problems.

Second, foreign banks from developing countries tend to be less efficient than other banks. *Foreign Developing* is positive in all six estimations and significant in three. Therefore, being a bank from a developing country reduces cost efficiency relative to banks from developed economies.

Third, we do not observe a significant difference in efficiency between foreign banks from developed countries and domestic banks. Neither *Domestic Public*, nor *Domestic Private* are significant in all estimations, with the exception of the specification (6). Therefore, foreign banks from developed countries do not have an advantage in efficiency relative to domestic banks in African countries. This result suggests that the global advantage of these foreign banks would compensate the home field advantage from domestic banks without being sufficient to exceed it.

Fourth, we point out that size and output mix have an impact on cost efficiency of African banks. Namely, *Medium Bank* is significantly negative in two specifications while *Large Bank* is never significant. These results support the view that medium-sized banks are the most efficient, suggesting that size would favour cost efficiency until a certain scale. In

addition, *Loans to Other Earning Assets* is significantly negative in five specifications, which suggests that a greater share of loans relative to other earning assets would be beneficial to cost efficiency. In other words, asset mix does not seem to be neutral to cost efficiency. Finally, *Bank Soundness* is significantly negative in all estimations suggesting that greater equity to assets ratio is associated with higher efficiency.

1.4.3. Additional estimations

Our key finding of the best efficiency for PABs is explained by the fact that these banks combine the global advantage and the home field advantage. To dig deeper this interpretation, we investigate the reality of the home field advantage based on the view that PABs are the foreign banks with the best knowledge of the host country and therefore the ones suffering the least of informational problems.

We therefore provide additional estimations performed only on the foreign banks of our sample to check if proximity from an institutional and from a geographic perspective between the home country and the host country exerts a beneficial impact on bank efficiency in particular for PABs.

We first investigate the role of institutional proximity between host and home countries with the presence of colonial ties following Liou and Rao-Nicholson (2017). This latter work studies the impact of colonial ties on South African cross-border firms' acquisitions. We assume that countries that belonged to a same colonial empire share similar institutional features. We build the dummy variable *Colonial Ties* equal to one if the host country of the bank is a former colony of its home country and zero otherwise. For example, *Colonial Ties* is equal to one for the subsidiary of the French bank BNP Paribas in Togo since Togo used to be a French colony. This variable refers only to foreign banks from developed countries. We build another dummy variable, *Similar Colonial Ties*, which is equal to one if both the home country and the host country of the bank used to belong to the same colonial empire, and zero otherwise. For example, *Similar Colonial Ties* is equal to one for the subsidiary of the Moroccan bank Attijariwafa Bank in Senegal since Morocco and Senegal were part of the French colonial empire. Thus, *Similar Colonial Ties* refers to Pan-African banks and foreign banks from

developing countries¹³. In line with our hypothesis, we expect that both dummy variables are positively related to bank efficiency.

Table 1.9. displays the results for these estimations. We observe that *Colonial Ties* and *Similar Colonial Ties* are both significantly negative in all estimations. These results show that colonial links favour efficiency in accordance with our hypothesis that home and host countries share similar institutional features thanks to their common colonial past. Thus, this institutional proximity contributes to reduce costs of foreign banks which expand abroad. These estimations provide evidence of the beneficial influence of institutional proximity between home country and host country on bank efficiency.

We go one step further in the estimations to investigate if PABs benefit from the home field advantage through institutional similarity and geographic proximity in comparison to other foreign banks.

To measure institutional similarity, we follow the approach of Lensink, Meesters and Naaborg (2008) who calculate it by the correlation coefficient between six home and six host country governance indicators from World Governance Indicators provided by the World Bank (*Similarity*). These authors have provided an investigation of the influence of institutional similarity between home and host country on efficiency of foreign banks in a worldwide study and show that it increases efficiency. Geographic distance is measured with the crow-fly distance between host and home countries of the bank (*Distance*). This variable has been normalized through a feature scaling so that it ranges between 0 and 1 with the following operation: $x' = (x - \min(x)) / (\max(x) - \min(x))$ where x is the original value and x' the normalized value.

Our hypothesis is that the home field advantage of PABs is notably based on the fact that these banks are the foreign banks benefiting the most of institutional similarity and closer geographic distance.

To investigate this hypothesis, we include *Similarity* and *Distance* in the estimations and add interaction terms of these variables with ownership dummy variables *Pan African* and *Foreign Developing*. We are then able to check if the impact of institutional similarity and

¹³ Regarding foreign banks from developing countries, only banks from India present in Kenya and Mauritius are concerned in our database since India was part of the British colonial empire. Otherwise, the dummy *Similar Colonial Ties* refers to Pan-African banks.

geographic distance plays a more beneficial role on efficiency for PABs in comparison to foreign banks from developed countries, the omitted category in the estimations, which also benefit from the global advantage.

Tables 1.10. and 1.11. respectively display the estimations for institutional similarity and for geographic distance. Two conclusions emerge. First, we observe that *Pan African × Similarity* is significantly negative in three of the six estimations while *Pan African* is significantly negative in all estimations. This result shows that Pan African banks are more efficient than foreign banks from developed countries while the advantage in efficiency increases with institutional similarity.

Second, we find that *Pan African × Distance* is significantly positive while *Pan African* is significantly negative in all estimations. Therefore, Pan-African banks are more efficient than foreign banks from developed countries while the advantage in efficiency is reduced with greater geographic distance between home and host countries.

Thus, these estimations support the hypothesis that PABs enhance their advantage in efficiency relative to foreign banks from developed countries through greater proximity from an institutional and a geographic perspective.

1.4.4. Robustness checks

The intermediation approach has been used to specify inputs and outputs. However, the production approach according to which the bank uses labour and physical capital to produce loans and deposits has also been often adopted to measure bank efficiency in developing and emerging countries (e.g., Karas, Schoors and Weill, 2010).

We can therefore question whether our main findings are robust to the specification of the production approach to select inputs and outputs. In this aim, we redo the multivariate estimations by using the production approach. We then consider two outputs, total loans and total deposits, and two input prices, price of labour and price of physical capital defined as before.

Table 1.12. provides the new estimations comparing foreign banks, domestic state-owned banks, and domestic private banks. We find support for the findings obtained in the main

estimations with the intermediation approach: foreign banks and domestic private banks are significantly more efficient than domestic state-owned banks. *Foreign Bank* and *Domestic Private* are significantly negative in all six estimations.

Table 1.13. displays the new estimations comparing all types of banks. They confirm our key finding that Pan-African banks are the most efficient banks. We again observe that *Pan African* is significantly negative in all estimations while no other ownership dummy variable is significantly negative. In addition, we still find evidence that foreign banks from developing countries are less efficient than foreign banks from developed countries, the omitted category, with *Foreign Developing* being significantly positive in all estimations. For the rest, we observe differences for domestic banks. While *Domestic Public* and *Domestic Private* were not significant in the main estimations with the intermediation approach, they are now significantly positive in all estimations with the production approach. This latter result suggests that foreign banks from developed countries are more efficient than domestic banks when considering the production approach. Therefore, the choice of the approach for the specification of inputs and outputs does not influence our findings with the exception of the efficiency comparison between foreign banks from developed countries and domestic countries.

1.5. Conclusion

The development of PABs has been a major change for African banking systems in the recent years. In this study, we examine if these banks are more efficient than domestic banks and other forms of foreign banks. Our major conclusion is that PABs are the most efficient banks in African banking industries. They have greater efficiency than domestic banks, either privately-owned or state-owned, but also than foreign banks originating from developed or developing countries.

We explain this finding by the fact that these banks have the best of both worlds. PABs benefit from the global advantage relative to domestic banks since they work on a broader scale and have better expertise from larger experience. Simultaneously PABs have the home field advantage relative to foreign banks from non-African countries with a better knowledge of local environment. Additional estimations show that PABs are the foreign banks benefiting the most from institutional similarity and closer geographic distance between home and host countries.

Moreover, we do not find robust evidence that foreign banks from developed countries would be more efficient than domestic banks. Finally, foreign banks from developing countries tend to be less efficient than all other forms of banks.

Therefore, this paper provides a contribution to the debate on the link between foreign ownership and bank efficiency. While the debate tends to find opposing conclusions in developed and developing countries, we show that the origin of the bank associated with the host region can influence the efficiency of foreign banks with the case of Pan-African banks.

In terms of policy implications, this work contributes to a better understanding of the implications of the expansion of Pan-African banks. We argue that foreign bank entry can favour bank efficiency in African countries, which is a major issue for these bank-based financial systems. However, the type of foreign banks matters since Pan-African banks can contribute to promote efficiency relative to domestic banks. Favouring Pan-African bank entry appears to be a relevant policy.

Our research is an initial step towards understanding the effects of Pan-African banking development. This expansion can have key implications for financial stability by fostering contagion effects across African countries and by creating systemic banks leading to moral hazard issues for financial authorities. We let these questions for further research.

References

- Asongu, S., 2017. The Effect of Reducing Information Asymmetry on Loan Price and Quantity in the African Banking Industry. *Research in International Business and Finance* 41, 185-197.
- Barros, C.P., Wanke, P., 2014. Banking Efficiency in Brazil. *Journal of International Financial Markets, Institutions and Money* 28, 54-65.
- Battese, G.E., Coelli, T.J., 1995. A Model for Technical Inefficiency Effects in a Stochastic Frontier Production Function for Panel Data. *Empirical Economics* 20, 325–332.
- Beck, T., 2015. Cross-Border Banking and Financial Deepening: The African Experience. *Journal of African Economies* 24, 32–45.
- Beck, T., Cull, R., Jerome, A., 2005. Bank Privatization and Performance: Empirical Evidence from Nigeria. *Journal of Banking and Finance* 29, 2355–2379.
- Beck, T., Fuchs, M., Singer, D., Witte, M., 2014. Making Cross-Border Banking Work for Africa. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and International Bank for Reconstruction and Development / The World Bank.
- Berger, A.N., DeYoung, R., Genay, H., Udell, G.F., 2000. The Globalization of Financial Institutions: Evidence from Cross-Border Banking Performance. *Brookings-Wharton Papers on Financial Services* 3, 23–125.
- Berger, A.N., Hasan, I., Zhou, M., 2009. Bank Ownership and Efficiency in China: What Will Happen in the World's Largest Nation? *Journal of Banking and Finance* 33, 113–130.
- Bhattacharyya, A., Lovell, C.A.K., Sahay, P., 1997. The Impact of Liberalization on the Productive Efficiency of Indian Commercial Banks. *European Journal of Operational Research* 98, 332–345.
- Boateng, A., Asongu, S., Akamavi, R., Tchamyou, V., 2018. Information Asymmetry and Market Power in the African Banking Industry. *Journal of Multinational Financial Management* 44, 69-83.
- Bonaccorsi di Patti, E., Hardy, D.C., 2005. Financial Sector Liberalization, Bank Privatization, and Efficiency: Evidence from Pakistan. *Journal of Banking and Finance* 29, 2381–2406.
- Bonin, J.P., Hasan, I., Wachtel, P., 2005. Privatization Matters: Bank Efficiency in Transition Countries. *Journal of Banking and Finance* 29, 2155–2178.
- Boycko, M., Shleifer, A., Vishny, R., 1996. A Theory of Privatisation, *Economic Journal* 106, 309-319.

- Chen, C., 2009. Bank Efficiency in Sub-Saharan African Middle-Income Countries (Working Papers 09/14). International Monetary Fund, Washington, DC.
- Claessens, S., Demirgüç-Kunt, A., Huizinga, H., 2001. How Does Foreign Entry Affect Domestic Banking Markets? *Journal of Banking and Finance* 25, 891–911.
- Clarke, G.R.G., Cull, R., Fuchs, M., 2009. Bank Privatization in Sub-Saharan Africa: The Case of Uganda Commercial Bank. *World Development* 37, 1506–1521.
- Cull, R., Spreng, C.P., 2011. Pursuing Efficiency while Maintaining Outreach: Bank Privatization in Tanzania. *Journal of Development Economics* 94, 254–261.
- DeYoung, R., Nolle, D., 1996. Foreign-Owned Banks in the United States: Earning Market Share or Buying It? *Journal of Money, Credit and Banking* 28, 4, 622–636.
- Enoch, C., Mathieu, P., Mecagni, M., 2015. Pan-African Banks. Opportunities and Challenges for Cross-Border Oversight. International Monetary Fund, Washington, D.C.
- Figueira, C., Nellis, J., Parker, D., 2009. The Effects of Ownership on Bank Efficiency in Latin America. *Applied Economics* 41, 2353–2368.
- Fries, S., Taci, A., 2005. Cost Efficiency of Banks in Transition: Evidence from 289 Banks in 15 Post-Communist Countries. *Journal of Banking and Finance* 29, 55–81.
- Gulati, R., Kumar, S., 2016. Assessing the Impact of the Global Financial Crisis on the Profit Efficiency of Indian Banks. *Economic Modelling* 58, 167–181.
- Hauer, D., Peiris, S.J., 2008. Banking Efficiency and Competition in Low Income Countries: The Case of Uganda. *Applied Economics* 40, 2703–2720.
- Hermes, N., Meesters, A., 2015. Financial Liberalization, Financial Regulation and Bank Efficiency: a Multi-Country Analysis. *Applied Economics* 47, 2154–2172.
- Kablan, S., 2007. Measuring Bank Efficiency in Developing Countries: The Case of WAEMU (West Africa Economic Monetary Union). African Economic Research Consortium.
- Karas, A., Schoors, K., Weill, L., 2010. Are Private Banks More Efficient than Public Banks? Evidence from Russia. *Economics of Transition* 18, 209–244.
- Kirpatrick, C., Murinde, V., Tefula, M., 2008. The Measurement and Determinants of X-Inefficiency in Commercial Banks in Sub-Saharan Africa. *European Journal of Finance* 14, 7, 625–639.
- Kodongo, O., Natto, D., Biekpe, N., 2015. Explaining Cross-Border Bank Expansion in East Africa. *Journal of International Financial Markets, Institutions and Money* 36, 71–84.
- Lensink, R., Meesters, A., Naaborg, I., 2008. Bank Efficiency and Foreign Ownership: Do Good Institutions Matter? *Journal of Banking and Finance* 32, 834–844.
- Léon, F., 2016. Does the Expansion of Regional Cross-Border Banks Affect Competition in

- Africa? Indirect Evidence. *Research in International Business and Finance* 37, 66–77.
- Liou, R.-S., Rao-Nicholson, R.-N., 2017. Out of Africa: The Role of Institutional Distance and Host-Home Colonial Tie in South African Firms' Post-Acquisition Performance in Developed Economies. *International Business Review* 26, 1184–1195.
- Okeahalam, C.C., 2008. Internationalization and Firm Performance: Evidence from Estimates of Efficiency in Banking in Namibia and Tanzania. *Journal of International Development* 20, 942–964.
- Omran, M., 2007. Privatization, State Ownership, and Bank Performance in Egypt. *World Development* 35, 714–733.
- Pelletier A., 2018. Performance of Foreign Banks in Developing Countries: Evidence from Sub-Saharan African Banking Markets. *Journal of Banking and Finance* 88, 292-311.
- Rowthorn, B., Chang, H.-J, 1993. Public Ownership and the Theory of the State, in *The Political Economy of privatisation* (Eds.) T. Clarke and C. Pitelis, Routledge, London.
- Sathye, M., 2001. X-Efficiency in Australian Banking: An Empirical Investigation. *Journal of Banking and Finance* 25, 3, 613-630.
- Shleifer, A., Vishny, R., 1994. Politicians and Firms. *Quarterly Journal of Economics* 106, 995-1025.
- Shleifer, A., Vishny, R., 1998. *The Grabbing Hand: Government Pathologies and Their Cures*. Harvard University Press, Cambridge.
- Stigler, G., 1971. The Theory of Economic Regulation. *Bell Journal of Economics* 2, 1, 3-21.
- Weill, L., 2003. Banking Efficiency in Transition Economies: The Role of Foreign Ownership. *Economics of Transition* 11, 569–592.
- Yildirim, H.S., Philippatos, G.C., 2007. Efficiency of Banks: Recent Evidence from the Transition Economies of Europe, 1993-2000. *European Journal of Finance* 13, 123–143.

Tables

Table 1.1. Sample information

This table shows the number of banks in the sample by category and country. Some banks might be included twice when a change in ownership occurred during the sample period.

Country	N	Banks by ownership				
		Foreign			Domestic	
		Pan African	Developed	Developing	Private	Public
Algeria	13	0	3	4	1	5
Angola	11	1	4	0	4	2
Benin	4	4	0	0	0	0
Botswana	5	3	1	0	1	0
Burkina Faso	5	4	0	0	2	0
Cameroon	6	3	3	0	1	0
Cape Verde	2	0	1	0	1	0
Congo	4	4	1	0	0	0
Cote d'Ivoire	6	4	3	0	0	0
Dem. Rep. of Congo	4	0	2	0	2	1
Djibouti	2	1	2	0	0	0
Egypt	24	0	5	9	4	6
Equatorial Guinea	2	1	1	0	0	0
Eritrea	1	0	0	0	0	1
Ethiopia	7	0	0	0	6	1
Gabon	3	1	1	0	1	0
Ghana	10	5	2	0	2	1
Kenya	17	4	2	1	10	1
Lesotho	1	1	0	0	0	0
Libya	9	0	1	3	3	2
Madagascar	2	1	1	0	0	0
Mali	5	4	1	0	2	0
Mauritius	12	4	3	2	5	0
Morocco	9	0	2	0	6	1
Mozambique	5	2	2	0	1	0
Namibia	4	3	0	0	1	0
Niger	1	1	0	0	0	0
Nigeria	18	2	2	0	14	1
Rwanda	1	0	0	0	0	1
Senegal	8	4	2	0	2	1
Seychelles	1	0	1	0	0	0
South Africa	8	0	1	0	7	0
Sudan	4	0	0	1	1	2
Tanzania	7	2	2	0	3	0
Togo	2	0	0	0	2	0
Tunisia	13	2	3	2	5	3
Uganda	5	2	1	0	2	0
Zambia	5	3	2	0	0	1
Zimbabwe	2	1	0	0	1	0
Total	248	67	55	22	90	30

Table 1.2. Pan-African banks in the sample

This table shows Pan-African banks in the sample with home country and host countries in Africa.

Bank	Home country	Host countries in Africa
Standard Bank Group	South Africa	Angola, Botswana, Democratic Republic of Congo, Ghana, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Nigeria, South Africa, Swaziland, Uganda, Tanzania, Zambia, Zimbabwe
Bank of Africa	Mali (Morocco since 2010)	Benin, Burkina Faso, Burundi, Cote d'Ivoire, Democratic Republic of Congo, Djibouti, Ethiopia, Ghana, Kenya, Madagascar, Mali, Niger, Rwanda, Senegal, Tanzania, Togo, Uganda
Banque Marocaine du Commerce Extérieur (BMCE)	Morocco	Benin, Burkina Faso, Burundi, Cote d'Ivoire, Democratic Republic of Congo, Djibouti, Ethiopia, Ghana, Kenya, Madagascar, Mali, Morocco, Niger, Rwanda, Senegal, Tanzania, Togo, Uganda
Ecobank	Togo	Angola, Benin, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Congo, Cote d'Ivoire, Democratic Republic of Congo, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Kenya, Liberia, Malawi, Mali, Mozambique, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, South Sudan, South Africa, Tanzania, Togo, Uganda, Zambia, Zimbabwe
Diamond Bank	Nigeria	Benin, Cote d'Ivoire, Nigeria, Senegal, Togo
Groupe Banque Centrale Populaire (GBCP)	Morocco	Benin, Burkina Faso, Central African Republic, Cote d'Ivoire, Guinea, Mali, Niger, Morocco, Senegal, Togo
United Bank for Africa	Nigeria	Benin, Burkina Faso, Cameroon, Chad, Congo, Cote d'Ivoire, Democratic Republic of Congo, Gabon, Ghana, Guinea, Kenya, Liberia, Mali, Mozambique, Nigeria, Senegal, Sierra Leone, Tanzania, Uganda, Zambia
Firststrand Limited	South Africa	Botswana, Ghana, Lesotho, Mauritius, Mozambique, Namibia, Nigeria, South Africa, Swaziland, Tanzania, Zambia
Barclays Africa Group	South Africa	Botswana, Ghana, Kenya, Mauritius, Mozambique, Namibia, Nigeria, Seychelles, South Africa, Uganda, Tanzania, Zambia
BGFI Bank	Congo	Benin, Cameroon, Congo, Côte d'Ivoire, Democratic Republic of Congo, Equatorial Guinea, Gabon, Madagascar
Access Bank	Nigeria	Democratic Republic of Congo, Gambia, Ghana, Nigeria, Rwanda, Sierra Leone, Zambia
Afriland first bank	Cameroon	Cameroon, Congo, Democratic Republic of Congo, Equatorial Guinea, Guinea, Liberia, Sao Tome and Principe, South Sudan, Zambia
Zenith Bank	Nigeria	Gambia, Ghana, Nigeria, Sierra Leone
Nedbank Group	South Africa	Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zimbabwe
Investec Bank Limited	South Africa	Botswana, Mauritius, Namibia, South Africa
CIEL Limited	Mauritius	Botswana, Kenya, Madagascar, Mauritius, Seychelles, South Africa, Tanzania, Uganda, Zambia
Attijariwafa Bank	Morocco	Benin, Burkina Faso, Cameroon, Congo, Côte d'Ivoire, Gabon, Guinea Bissau, Mali, Mauritania, Morocco, Niger, Senegal, Tunisia, Togo
Banque Atlantique	Togo (Morocco since 2012)	Benin, Burkina Faso, Central African Republic, Cote d'Ivoire, Guinea, Mali, Niger, Senegal, Togo
Libyan Foreign Bank	Libya	Algeria, Burkina Faso, Chad, Egypt, Libya, Mali, Mauritania, Niger, Sudan, Tunisia, Togo, Uganda, Zimbabwe

Table 1.3. Descriptive statistics

This table indicates the mean values and standard deviations for the variables used for efficiency scores for the full sample. All statistics are computed for observations over the period 2002–2015.

Variable	All Banks	
	Mean	Std Dev
Total Costs	243,706.7	862,066.3
Loans	2,093,456	7,773,007
Other Earning Assets	1,339,957	4,073,008
Price of Labor (%)	1.81	1.15
Price of Borrowed Funds (%)	3.75	9.64
Price of Physical Capital (%)	157.87	271.09
Loans to Other Earning Assets	378.44	16,993.07
Bank Soundness (%)	10.81	5.88
Total Assets	3,897,652	12,100,000
GDP per Capita	2,743.71	2,657.99
Domestic Credit to Private Sector (% of GDP)	33.54	32.21
Inflation, consumer prices (annual %)	7.77	9.18
Rule of Law	4.02	1.26
Bank Concentration (%)	65.21	16.86
Colonial Ties	0.26	0.44
Similar Colonial Ties	0.44	0.5
Institutional Similarity	0.06	0.58
Geographic Distance (in miles)	2,102.40	1,607.91

Table 1.4. Descriptive statistics by ownership type

This table indicates the mean values for the bank-level variables used for efficiency scores for each ownership type. All statistics are computed for observations over the period 2002–2015.

Variable	Pan-African Banks	Foreign Developed Banks	Foreign Developing Banks	Domestic Private Banks	Domestic Public Banks
Total Costs	64,601.13	86,394.52	86,268.61	524,933.3	269,761.6
Loans	442,717.5	748,369.8	663,321.2	4,675,826	2,145,793
Other Earning Assets	295,626.4	622,400.3	635,043.7	2,297,907	3,041,748
Price of Labor (%)	2.09	1.86	0.99	1.74	1.66
Price of Borrowed Funds (%)	2.88	2.48	3.82	4.88	5.09
Price of Physical Capital (%)	171.23	221.55	83.84	145.29	82.90
Loans to Other Earning Assets	2.05	1767.54	24.44	14.91	2.42
Total Assets	912,226	1,624,500	1,594,284	7,714,873	6,096,978
Bank Soundness (%)	9.96	11.11	13.94	11.37	8.85

Table 1.5. Cost efficiency scores by ownership type

This table shows the cost efficiency scores obtained with the Battese and Coelli (1995) model. Means are displayed with standard deviations between parentheses.

Year	All Banks	Pan African Banks	Foreign Developed Banks	Foreign Developing Banks	Domestic Private Banks	Domestic Public Banks
All	0.771 (0.139)	0.791 (0.118)	0.776 (0.137)	0.719 (0.170)	0.762 (0.146)	0.765 (0.142)
2002	0.800 (0.134)	0.838 (0.083)	0.825 (0.120)	0.851 (0.045)	0.810 (0.032)	0.633 (0.145)
2003	0.805 (0.115)	0.825 (0.094)	0.815 (0.096)	0.833 (0.089)	0.790 (0.144)	0.772 (0.125)
2004	0.792 (0.144)	0.808 (0.095)	0.794 (0.139)	0.661 (0.327)	0.809 (0.142)	0.783 (0.108)
2005	0.801 (0.122)	0.835 (0.069)	0.804 (0.135)	0.800 (0.080)	0.780 (0.151)	0.780 (0.110)
2006	0.794 (0.135)	0.822 (0.099)	0.799 (0.148)	0.761 (0.108)	0.775 (0.156)	0.778 (0.135)
2007	0.793 (0.113)	0.803 (0.099)	0.801 (0.110)	0.684 (0.192)	0.800 (0.119)	0.774 (0.091)
2008	0.773 (0.121)	0.784 (0.096)	0.784 (0.120)	0.736 (0.113)	0.754 (0.148)	0.796 0.102
2009	0.762 (0.138)	0.770 (0.121)	0.772 (0.119)	0.651 (0.217)	0.768 (0.145)	0.780 (0.111)
2010	0.763 (0.154)	0.773 (0.131)	0.757 (0.145)	0.705 (0.223)	0.773 (0.159)	0.767 (0.161)
2011	0.755 (0.149)	0.781 (0.135)	0.741 (0.149)	0.731 (0.161)	0.745 (0.152)	0.755 (0.176)
2012	0.749 (0.149)	0.764 (0.146)	0.745 (0.161)	0.708 (0.161)	0.736 (0.139)	0.787 (0.161)
2013	0.762 (0.146)	0.782 (0.135)	0.754 (0.166)	0.727 (0.147)	0.754 (0.136)	0.776 (0.173)
2014	0.758 (0.140)	0.787 (0.119)	0.774 (0.122)	0.697 (0.166)	0.743 (0.147)	0.745 (0.169)
2015	0.759 (0.138)	0.797 (0.110)	0.770 (0.126)	0.723 (0.133)	0.742 (0.150)	0.721 (0.178)

Table 1.6. Significance of differences in cost efficiency between ownership types

This table reports the differences in cost efficiency scores between ownership types of banks. Pan : Pan-African banks. Fod: Foreign developed banks. Fog: Foreign developing banks. Pri: Domestic private banks. Pub: Domestic public banks. *, **, *** indicates a significant mean difference at 10%, 5% and 1% level.

Year	Diff (Pan – Fod)	Diff (Pan-Fog)	Diff (Pan-Pri)	Diff (Pan-Pub)	Diff (Fod-Fog)	Diff (Fod-Pri)	Diff (Fod-Pub)	Diff (Fog-Pri)	Diff (Fog-Pub)	Diff (Pri-Pub)
All	0.015**	0.072***	0.029***	0.026***	0.057***	0.013	0.011	-0.043***	-0.046***	-0.003
2002	0.013	-0.012	0.029	0.205***	-0.026	0.015	0.191***	0.041	0.217**	0.176***
2003	0.010	-0.008	0.035	0.053	-0.018	0.025	0.044	0.043	0.061	0.018
2004	0.014	0.147*	-0.001	0.025	0.133	-0.015	0.011	-0.147*	-0.121	0.026
2005	0.030	0.035	0.055*	0.054**	0.004	0.024	0.024	0.020	0.020	-0.000
2006	0.023	0.061	0.047	0.044	0.038	0.023	0.021	-0.014	-0.017	-0.003
2007	0.002	0.119**	0.003	0.029	0.117**	0.001	0.027	-0.116**	-0.090	0.026
2008	0.000	0.048	0.030	-0.012	0.047	0.030	-0.012	-0.017	-0.060	-0.042
2009	-0.001	0.120***	0.002	-0.009	0.121**	0.004	-0.008	-0.117**	-0.129**	-0.012
2010	0.016	0.068	-0.000	0.006	0.052	-0.016	-0.010	-0.068	-0.062	0.006
2011	0.040	0.050	0.036	0.026	0.010	-0.004	-0.014	-0.014	-0.024	-0.010
2012	0.018	0.055	0.028	-0.023	0.037	0.009	-0.042	-0.027	-0.079	-0.051
2013	0.028	0.055	0.028	0.006	0.027	0.000	-0.022	-0.027	-0.049	-0.022
2014	0.013	0.091**	0.045*	0.043	0.078*	0.032	0.030	-0.046	-0.048	-0.002
2015	0.028	0.075**	0.055**	0.076**	0.047	0.027	0.048	-0.020	0.001	0.021

Table 1.7. Efficiency estimations: The role of foreign banks

This table shows estimations with the one-step model of Battese and Coelli (1995). We only report estimates of the tested country-level variables for the cost frontier. We report all estimates of the equation explaining inefficiency. *Foreign Bank* and *Domestic Private* are dummy variables representing foreign ownership and domestic private ownership. *Domestic Public* is the omitted dummy variable. *GDP per Capita* is gross domestic product divided by midyear population. *Domestic Credit to Private Sector* is the ratio of financial resources provided to the private sector by financial institutions divided by GDP. *Inflation* is measured by the consumer price index in annual percent. *Rule of Law* is a measure for the quality of the institutions between 0 and 10, 0 being the worse score and 10 the best. *Bank Concentration* is the percent of assets held by the three largest commercial banks as a share of total commercial banking assets. *Medium Bank* is equal to one if the bank ranges between the 25th and the 75th percentile of total assets of the sample and zero otherwise. *Large Bank* is equal to one if the bank has a size above the 75th percentile of total assets. *Loans to Other Earning Assets* is the ratio of loans to investment assets. *Bank Soundness* is the ratio of equity to total assets. Values of t-statistics are shown in parentheses. *, **, *** denote statistical significance at the 10, 5 and 1% levels.

Cost Frontier						
	(1)	(2)	(3)	(4)	(5)	(6)
GDP per Capita	-	-	0.07***	0.05***	0.07***	0.06***
			(-8.76)	(-6.76)	(-8.91)	(-7.54)
Domestic Credit to Private Sector	-	-	-0.30***	-0.32***	-0.28***	-0.29***
			(-9.50)	(-10.16)	(-8.49)	(-8.97)
Inflation	-	-	0.19**	0.19**	0.16*	0.18**
			(-2.26)	(-2.20)	(-1.82)	(-2.05)
Rule of Law	-	-	-0.02***	-0.02***	-0.03***	-0.02***
			(-3.58)	(-2.67)	(-4.04)	(-3.44)
Bank Concentration	-	-	-	-	0.07*	0.10***
					(-1.81)	(-2.75)
Year fixed effects	No	Yes	No	Yes	No	Yes
Equation Explaining Inefficiency						
Domestic Private	-0.36*	-0.36**	-0.44**	-0.52**	-0.39***	-0.48***
	(-1.66)	(-2.04)	(-2.07)	(-2.21)	(-2.89)	(-3.51)
Foreign Bank	-0.63**	-0.64***	-0.72***	-0.85**	-0.57***	-0.71***
	(-2.17)	(-2.77)	(-2.85)	(-2.38)	(-3.90)	(-5.03)
Medium Bank	-0.13	-0.11	-0.24	-0.30	-0.31***	-0.39***
	(-0.85)	(-0.79)	(-1.51)	(-1.01)	(-2.77)	(-3.54)
Large Bank	-0.30	-0.17	-0.49	-0.48**	-0.40***	-0.43**
	(-1.09)	(-0.78)	(-1.62)	(-2.27)	(-2.69)	(-2.35)
Loans to Other Earning Assets	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***
	(-15.74)	(-12.99)	(-15.74)	(-13.55)	(-20.00)	(-23.93)
Bank Soundness	-0.90	-2.33**	-0.80	-1.60***	-0.39	-0.93
	(-1.01)	(-1.98)	(-1.04)	(-2.93)	(-0.52)	(-1.26)
Number of observations	2196	2196	1959	1959	1823	1823
Number of banks	248	248	242	242	235	235
Log likelihood	-214.54	-177.28	-84.37	-54.48	-61.62	-41.46

Table 1.8. Efficiency estimations: The role of Pan-African banks

This table shows estimations with the one-step model of Battese and Coelli (1995). We only report estimates of the tested country-level variables for the cost frontier. We report all estimates of the equation explaining inefficiency. *Pan African*, *Foreign Developing*, *Domestic Private* and *Domestic Public* are dummy variables representing the different ownership types. *Foreign Developed* is the omitted dummy variable. *GDP per Capita* is gross domestic product divided by midyear population. *Domestic Credit to Private Sector* is the ratio of financial resources provided to the private sector by financial institutions divided by GDP. *Inflation* is measured by the consumer price index in annual percent. *Rule of Law* is a measure for the quality of the institutions between 0 and 10, 0 being the worse score and 10 the best. *Bank Concentration* is the percent of assets held by the three largest commercial banks as a share of total commercial banking assets. *Medium Bank* is equal to one if the bank ranges between the 25th and the 75th percentile of total assets of the sample and zero otherwise. *Large Bank* is equal to one if the bank has a size above the 75th percentile of total assets. *Loans to Other Earning Assets* is the ratio of loans to investment assets. *Bank Soundness* is the ratio of equity to total assets. Values of t-statistics are shown in parentheses. *, **, *** denote statistical significance at the 10, 5 and 1% levels.

Cost Frontier						
	(1)	(2)	(3)	(4)	(5)	(6)
GDP per Capita	-	-	0.06*** (-8.15)	0.06*** (-6.98)	0.07*** (-8.44)	0.06*** (-6.73)
Domestic Credit to Private Sector	-	-	-0.31*** (-9.43)	-0.31*** (-9.72)	-0.28*** (-8.66)	-0.30*** (-9.21)
Inflation	-	-	0.20** (-2.41)	0.20** (-2.36)	0.15* (-1.81)	0.16* (-1.83)
Rule of Law	-	-	-0.02*** (-3.57)	-0.02*** (-3.00)	-0.02*** (-3.67)	-0.02*** (-2.87)
Bank Concentration	-	-	-	-	0.07* (-1.91)	0.11*** (-3.02)
Year fixed effects	No	Yes	No	Yes	No	Yes
Equation Explaining Inefficiency						
Pan African	-0.24** (-2.17)	-0.33** (-2.20)	-0.24*** (-2.85)	-0.33*** (-3.10)	-0.48** (-2.49)	-0.73*** (-5.88)
Foreign Developing	0.19** (-2.50)	0.17* (-1.92)	0.18* (-1.92)	0.16 (-1.40)	0.11 (-0.99)	0.06 (-0.44)
Domestic Private	0.02 (-0.28)	-0.02 (-0.23)	0.00 (-0.05)	-0.03 (-0.31)	-0.16 (-1.34)	-0.25*** (-2.72)
Domestic Public	-0.06 (-0.67)	-0.05 (-0.50)	-0.14 (-1.52)	-0.14 (-1.21)	-0.31** (-2.17)	-0.33*** (-2.62)
Medium Bank	0.02 (-0.24)	-0.01 (-0.12)	-0.09 (-1.22)	-0.15 (-1.37)	-0.29* (-1.86)	-0.42*** (-4.50)
Large Bank	0.08 (-0.65)	0.07 (-0.51)	-0.05 (-0.56)	-0.09 (-0.72)	-0.14 (-0.98)	-0.20 (-1.64)
Loans to Other Earning Assets	-0.00*** (-12.05)	-0.00*** (-12.10)	-0.00*** (-22.29)	0.00 (-0.16)	-0.00*** (-24.84)	-0.00*** (-22.32)
Bank Soundness	-1.27** (-2.24)	-1.88*** (-2.62)	-1.37*** (-3.07)	-1.81*** (-4.34)	-1.13** (-2.49)	-2.01*** (-4.64)
Number of observations	2196	2196	1959	1959	1823	1823
Number of banks	248	248	242	242	235	235
Log likelihood	-211.05	-186.59	-87.04	-68.06	-55.19	-29.99

Table 1.9. Efficiency estimations: The influence of colonial ties

This table shows estimations with the one-step model of Battese and Coelli (1995). We only report estimates of the tested country-level variables for the cost frontier. We report all estimates of the equation explaining inefficiency. The estimations are performed only for foreign banks. *Colonial Ties* is a dummy variable equal to one if the host country of the bank is a former colony of its home country. *Similar Colonial Ties* is a dummy variable equal to one if both the home country and the host country of the bank used to belong to the same colonial empire. *GDP per Capita* is gross domestic product divided by midyear population. *Domestic Credit to Private Sector* is the ratio of financial resources provided to the private sector by financial institutions divided by GDP. *Inflation* is measured by the consumer price index in annual percent. *Rule of Law* is a measure for the quality of the institutions between 0 and 10, 0 being the worse score and 10 the best. *Bank Concentration* is the percent of assets held by the three largest commercial banks as a share of total commercial banking assets. *Medium Bank* is equal to one if the bank ranges between the 25th and the 75th percentile of total assets of the sample and zero otherwise. *Large Bank* is equal to one if the bank has a size above the 75th percentile of total assets. *Loans to Other Earning Assets* is the ratio of loans to investment assets. *Bank Soundness* is the ratio of equity to total assets. Values of t-statistics are shown in parentheses. *, **, *** denote statistical significance at the 10, 5 and 1% levels.

Cost Frontier						
	(1)	(2)	(3)	(4)	(5)	(6)
GDP per Capita	-	-	0.00 (0.52)	-0.01 (-0.97)	-0.01 (-0.78)	-0.02* (-1.92)
Domestic Credit to Private Sector	-	-	-0.56*** (-12.55)	-0.58*** (-13.30)	-0.49*** (-10.19)	-0.50*** (-10.77)
Inflation	-	-	0.50*** (5.42)	0.50*** (5.13)	0.51*** (5.12)	0.54*** (5.19)
Rule of Law	-	-	0.00 (0.06)	0.00 (0.64)	0.00 (0.29)	0.01 (0.75)
Bank Concentration	-	-			0.11*** (2.75)	0.14*** (3.74)
Year fixed effects	No	Yes	No	Yes	No	Yes
Equation Explaining Inefficiency						
Colonial Ties	-0.38*** (-2.61)	-0.28** (-2.00)	-0.68*** (-3.80)	-0.58*** (-3.39)	-0.51*** (-3.95)	-0.42*** (-3.66)
Similar Colonial Ties	-0.46*** (-3.00)	-0.49*** (-2.86)	-0.47*** (-3.35)	-0.53*** (-3.30)	-0.44*** (-3.96)	-0.46*** (-4.09)
Medium Bank	-0.14 (-1.11)	-0.15 (-1.11)	-0.10 (-0.93)	-0.07 (-0.69)	-0.13 (-1.34)	-0.11 (-1.19)
Large Bank	0.01 (0.05)	0.08 (0.44)	0.05 (0.35)	0.14 (1.00)	0.11 (0.83)	0.17 (1.45)
Loans to Other Earning Assets	-0.00*** (-9.39)	-0.00*** (-3.79)	-0.00*** (-15.91)	-0.00*** (-14.25)	-0.00** (-2.34)	-0.00*** (-2.72)
Bank Soundness	-1.57* (-1.70)	-2.70** (-2.04)	-0.34 (-0.64)	-1.29 (-1.20)	0.40 (1.02)	-0.00 (-0.01)
Number of observations	1239	1239	1128	1128	1025	1025
Number of banks	139	139	138	138	133	133
Log likelihood	53.27	77.48	171.73	210.92	167.52	203.41

Table 1.10. Efficiency estimations: The influence of institutional similarity

This table shows estimations with the one-step model of Battese and Coelli (1995). We only report estimates of the tested country-level variables for the cost frontier. We report all estimates of the equation explaining inefficiency. The estimations are performed only for foreign banks. *Pan African*, and *Foreign Developing* are dummy variables representing the different ownership types. *Foreign Developed* is the omitted dummy variable. *Similarity* is the correlation coefficient between six home and six host country governance indicators from World Governance indicators from the World Bank. *GDP per Capita* is gross domestic product divided by midyear population. *Domestic Credit to Private Sector* is the ratio of financial resources provided to the private sector by financial institutions divided by GDP. *Inflation* is measured by the consumer price index in annual percent. *Rule of Law* is a measure for the quality of the institutions between 0 and 10, 0 being the worse score and 10 the best. *Bank Concentration* is the percent of assets held by the three largest commercial banks as a share of total commercial banking assets. *Medium Bank* is equal to one if the bank ranges between the 25th and the 75th percentile of total assets of the sample and zero otherwise. *Large Bank* is equal to one if the bank has a size above the 75th percentile of total assets. *Loans to Other Earning Assets* is the ratio of loans to investment assets. *Bank Soundness* is the ratio of equity to total assets. Values of t-statistics are shown in parentheses. *, **, *** denote statistical significance at the 10, 5 and 1% levels.

Cost Frontier						
	(1)	(2)	(3)	(4)	(5)	(6)
GDP per Capita	-	-	0.01 (0.80)	-0.01 (-0.72)	-0.01 (-1.11)	-0.02** (-1.98)
Domestic Credit to Private Sector	-	-	-0.50*** (-11.25)	-0.53*** (-12.41)	-0.43*** (-9.21)	-0.46*** (-10.14)
Inflation	-	-	0.46*** (4.72)	0.45*** (4.64)	0.44*** (4.23)	0.49*** (4.64)
Rule of Law	-	-	-0.00 (-0.47)	0.00 (0.35)	0.00 (0.22)	0.01 (0.72)
Bank Concentration	-	-	-	-	0.11*** (2.84)	0.14*** (3.92)
Year fixed effects	No	Yes	No	Yes	No	Yes
Equation Explaining Inefficiency						
Pan African	-0.22*** (-2.66)	-0.32** (-2.52)	-0.12* (-1.87)	-0.22*** (-2.69)	-0.21*** (-2.69)	-0.27*** (-3.45)
Pan African × Similarity	-0.18 (-1.54)	-0.27* (-1.84)	-0.17* (-1.78)	-0.24** (-2.18)	-0.10 (-1.04)	-0.15 (-1.42)
Foreign Developing	0.19 (1.61)	0.12 (0.77)	0.20* (1.90)	0.16 (1.25)	0.20** (2.04)	0.16 (1.45)
Foreign Developing x Similarity	-0.60*** (-2.65)	-0.80** (-2.53)	-0.60*** (-2.96)	-0.79*** (-3.13)	-0.47*** (-2.62)	-0.56*** (-2.89)
Medium Bank	-0.12 (-1.21)	-0.13 (-0.97)	-0.13 (-1.50)	-0.12 (-1.32)	-0.19** (-2.04)	-0.18** (-2.02)
Large Bank	0.08 (0.61)	0.16 (0.98)	0.04 (0.32)	0.12 (1.02)	0.03 (0.30)	0.09 (0.83)
Loans to Other Earning Assets	-0.00*** (-21.26)	-0.00*** (-4.60)	-0.00** (-2.33)	-0.00*** (-5.89)	-0.00** (-2.04)	-0.00*** (-8.82)
Bank Soundness	-1.24** (-2.30)	-2.58** (-2.50)	-0.48 (-0.99)	-1.49** (-2.02)	0.26 (0.73)	-0.13 (-0.28)
Similarity	0.17** (2.07)	0.23** (2.30)	0.19*** (2.75)	0.25*** (3.18)	0.17** (2.57)	0.22*** (3.12)
Number of observations	1137	1137	1128	1128	1025	1025
Number of banks	139	139	138	138	133	133
Log likelihood	43.99	73.99	150.54	200.20	155.42	198.67

Table 1.11. Efficiency estimations: The influence of geographic distance

This table shows estimations with the one-step model of Battese and Coelli (1995). We only report estimates of the tested country-level variables for the cost frontier. We report all estimates of the equation explaining inefficiency. The estimations are performed only for foreign banks. *Pan African*, and *Foreign Developing* are dummy variables representing the different ownership types. *Foreign Developed* is the omitted dummy variable. *Distance* is the crow-fly distance between host and home countries of the bank and has been normalized through a feature scaling. *GDP per Capita* is gross domestic product divided by midyear population. *Domestic Credit to Private Sector* is the ratio of financial resources provided to the private sector by financial institutions divided by GDP. *Inflation* is measured by the consumer price index in annual percent. *Rule of Law* is a measure for the quality of the institutions between 0 and 10, 0 being the worse score and 10 the best. *Bank Concentration* is the percent of assets held by the three largest commercial banks as a share of total commercial banking assets. *Medium Bank* is equal to one if the bank ranges between the 25th and the 75th percentile of total assets of the sample and zero otherwise. *Large Bank* is equal to one if the bank has a size above the 75th percentile of total assets. *Loans to Other Earning Assets* is the ratio of loans to investment assets. *Bank Soundness* is the ratio of equity to total assets. Values of t-statistics are shown in parentheses. *, **, *** denote statistical significance at the 10, 5 and 1% levels.

Cost Frontier						
	(1)	(2)	(3)	(4)	(5)	(6)
GDP per Capita	-	-	0.00	-0.01	-0.02	-0.02**
			-0.32	(-1.02)	(-1.46)	(-2.26)
Domestic Credit to Private Sector	-	-	-0.48***	-0.52***	-0.41***	-0.44***
			(-10.90)	(-12.13)	(-8.47)	(-9.57)
Inflation	-	-	0.45***	0.45***	0.45***	0.48***
			(4.68)	(4.57)	(4.32)	(4.57)
Rule of Law	-	-	-0.00	0.00	0.00	0.00
			(-0.47)	(0.17)	(0.15)	(0.54)
Bank Concentration	-	-	-	-	0.12***	0.14***
					(3.18)	(4.11)
Year fixed effects	No	Yes	No	Yes	No	Yes
Equation Explaining Inefficiency						
Pan African	-1.33***	-0.94**	-0.56***	-0.62***	-0.65**	-0.65***
	(-4.25)	(-2.19)	(-3.23)	(-3.14)	(-2.37)	(-2.71)
Pan African × Distance	3.49***	2.27**	1.77***	1.69***	1.64**	1.48**
	(3.74)	(2.07)	(3.29)	(2.91)	(2.30)	(2.38)
Foreign Developing	-0.81	-0.67	-0.63**	-0.93**	-0.48	-0.65*
	(-1.61)	(-1.26)	(-2.15)	(-2.12)	(-1.33)	(-1.78)
Foreign Developing x Distance	2.99*	2.13	2.51**	3.31**	2.06*	2.45**
	(1.71)	(1.16)	(2.46)	(2.28)	(1.68)	(2.00)
Medium Bank	-0.46**	-0.29	-0.22**	-0.16	-0.31**	-0.26**
	(-2.57)	(-1.51)	(-2.19)	(-1.56)	(-2.16)	(-2.06)
Large Bank	-0.28	0.01	-0.01	0.16	-0.03	0.10
	(-1.22)	(0.04)	(-0.08)	(1.17)	(-0.17)	(0.73)
Loans to Other Earning Assets	-0.00***	-0.00***	-0.00***	-0.00***	-0.00**	-0.00**
	(-10.45)	(-2.76)	(-12.82)	(-9.53)	(-2.01)	(-2.08)
Bank Soundness	-0.91	-2.48*	-0.23	-1.47**	0.60	0.04
	(-0.83)	(-1.94)	(-0.36)	(-2.27)	(1.14)	(0.07)
Distance	-1.25**	-0.50	-0.45	-0.36	-0.42	-0.33
	(-2.29)	(-0.96)	(-1.53)	(-1.23)	(-1.18)	(-1.07)
Number of observations	1239	1239	1128	1128	1025	1025
Number of banks	139	139	138	138	133	133
Log likelihood	55.61	81.37	154.54	202.12	157.62	199.25

Table 1.12. Robustness check: The role of foreign banks with the production approach

This table shows estimations with the one-step model of Battese and Coelli (1995). We only report estimates of the tested country-level variables for the cost frontier. We report all estimates of the equation explaining inefficiency. *Foreign Bank* and *Domestic Private* are dummy variables representing foreign ownership and domestic private ownership. *Domestic Public* is the omitted dummy variable. *GDP per Capita* is gross domestic product divided by midyear population. *Domestic Credit to Private Sector* is the ratio of financial resources provided to the private sector by financial institutions divided by GDP. *Inflation* is measured by the consumer price index in annual percent. *Rule of Law* is a measure for the quality of the institutions between 0 and 10, 0 being the worse score and 10 the best. *Bank Concentration* is the percent of assets held by the three largest commercial banks as a share of total commercial banking assets. *Medium Bank* is equal to one if the bank ranges between the 25th and the 75th percentile of total assets of the sample and zero otherwise. *Large Bank* is equal to one if the bank has a size above the 75th percentile of total assets. *Loans to Other Earning Assets* is the ratio of loans to investment assets. *Bank Soundness* is the ratio of equity to total assets. Inputs and outputs are chosen following the production approach. Values of t-statistics are shown in parentheses. *, **, *** denote statistical significance at the 10, 5 and 1% levels.

Cost Frontier						
	(1)	(2)	(3)	(4)	(5)	(6)
GDP per Capita	-	-	-0.01 (-0.85)	-0.02** (-2.26)	0.00 (0.30)	-0.01 (-0.96)
Domestic Credit to Private Sector	-	-	-0.11*** (-2.65)	-0.10** (-2.56)	-0.09** (-2.26)	-0.09** (-2.12)
Inflation	-	-	0.57*** (5.53)	0.59*** (5.70)	0.51*** (4.71)	0.53*** (4.76)
Rule of Law	-	-	0.01* (1.84)	0.02** (2.10)	0.01 (0.80)	0.01 (0.89)
Bank Concentration	-	-	-	-	-0.16*** (-3.19)	-0.14*** (-2.84)
Year fixed effects	No	Yes	No	Yes	No	Yes
Equation Explaining Inefficiency						
Domestic Private	-0.34*** (-2.85)	-0.36*** (-2.87)	-0.22* (-1.93)	-0.23* (-1.95)	-0.25* (-1.93)	-0.26* (-1.95)
Foreign Bank	-0.66*** (-4.17)	-0.69*** (-4.13)	-0.54*** (-3.56)	-0.57*** (-3.56)	-0.51*** (-3.14)	-0.54*** (-3.14)
Medium Bank	0.00 (-0.04)	0.01 (0.09)	0.04 (0.41)	0.06 (0.64)	0.05 (0.45)	0.07 (0.65)
Large Bank	0.29*** (2.84)	0.33*** (3.22)	0.28*** (2.80)	0.34*** (3.33)	0.33*** (3.10)	0.37*** (3.52)
Loans to Other Earning Assets	0.00 (1.14)	0.00 (1.00)	0.00 (1.10)	0.00 (0.84)	0.00 (0.92)	0.00 (0.68)
Bank Soundness	-0.25 (-0.42)	-0.73 (-1.08)	-0.10 (-0.18)	-0.62 (-0.98)	-0.58 (-0.88)	-1.15 (-1.44)
Number of observations	2196	2196	1959	1959	1823	1823
Number of banks	248	248	242	242	235	235
Log likelihood	-682.93	-665.03	-600.01	-577.93	-578.16	-558.86

Table 1.13. Robustness check: The role of Pan-African banks with the production approach

This table shows estimations with the one-step model of Battese and Coelli (1995). We only report estimates of the tested country-level variables for the cost frontier. We report all estimates of the equation explaining inefficiency. *Pan African*, *Foreign Developing*, *Domestic Private* and *Domestic Public* are dummy variables representing the different ownership types. *Foreign Developed* is the omitted dummy variable. *GDP per Capita* is gross domestic product divided by midyear population. *Domestic Credit to Private Sector* is the ratio of financial resources provided to the private sector by financial institutions divided by GDP. *Inflation* is measured by the consumer price index in annual percent. *Rule of Law* is a measure for the quality of the institutions between 0 and 10, 0 being the worse score and 10 the best. *Bank Concentration* is the percent of assets held by the three largest commercial banks as a share of total commercial banking assets. *Medium Bank* is equal to one if the bank ranges between the 25th and the 75th percentile of total assets of the sample and zero otherwise. *Large Bank* is equal to one if the bank has a size above the 75th percentile of total assets. *Loans to Other Earning Assets* is the ratio of loans to investment assets. *Bank Soundness* is the ratio of equity to total assets. Inputs and outputs are chosen following the production approach. Values of t-statistics are shown in parentheses. *, **, *** denote statistical significance at the 10, 5 and 1% levels.

Cost Frontier						
	(1)	(2)	(3)	(4)	(5)	(6)
GDP per Capita	-	-	-0.01 (-1.16)	-0.03*** (-2.67)	-0.00 (-0.16)	-0.02 (-1.46)
Domestic Credit to Private Sector	-	-	-0.13*** (-3.27)	-0.13*** (-3.18)	-0.12*** (-2.84)	-0.11*** (-2.67)
Inflation	-	-	0.55*** (5.47)	0.58*** (5.54)	0.51*** (4.78)	0.53*** (4.77)
Rule of Law	-	-	0.02* (1.93)	0.02** (2.40)	0.01 (1.17)	0.01 (1.47)
Bank Concentration	-	-	-	-	-0.13*** (-2.72)	-0.11** (-2.25)
Year fixed effects	No	Yes	No	Yes	No	Yes
Equation Explaining Inefficiency						
Pan African	-0.28*** (-3.11)	-0.33*** (-3.39)	-0.17** (-2.18)	-0.23*** (-2.70)	-0.21** (-2.25)	-0.27*** (-2.59)
Foreign Developing	0.43*** (5.75)	0.42*** (5.43)	0.41*** (-5.91)	0.40*** (5.54)	0.38*** (5.16)	0.37*** (4.78)
Domestic Private	0.13** (2.42)	0.12** (2.10)	0.19*** (3.97)	0.18*** (3.61)	0.14** (2.53)	0.13** (2.23)
Domestic Public	0.17** (2.51)	0.18*** (2.59)	0.14** (2.27)	0.15** (2.37)	0.11* (1.66)	0.12* (1.76)
Medium Bank	0.03 (0.45)	0.04 (0.51)	0.09 (1.41)	0.10 (1.55)	0.09 (1.29)	0.11 (1.39)
Large Bank	0.28*** (3.67)	0.31*** (3.93)	0.33*** (4.16)	0.36*** (4.52)	0.36*** (4.28)	0.39*** (4.54)
Loans to Other Earning Assets	0.00 (0.92)	0.00 (0.75)	0.00 (0.94)	0.00 (0.66)	0.00 (0.78)	0.00 (0.54)
Bank Soundness	-1.17** (-2.56)	-1.55*** (-3.01)	-0.77** (-2.04)	-1.13*** (-2.62)	-1.02** (-2.20)	-1.39** (-2.50)
Number of observations	2196	2196	1959	1959	1823	1823
Number of banks	248	248	242	242	235	235
Log likelihood	-668.74	-649.69	-585.68	-562.25	-565.08	-545.22

Chapter 2¹⁴

Cyclicalities of Lending in Africa: The Influence of Bank Ownership

Abstract

Ownership structure of banks has dramatically changed over the past two decades in African countries with privatization and foreign bank entry, including the expansion of Pan-African banks. The objective of this paper is to investigate how bank ownership influences cyclicalities of lending in Africa. We are then able to assess how changes in bank ownership influence the economy. To this end, we measure the sensitivity of bank loan growth to GDP per capita growth of the host country with dynamic GMM estimations. We use panel data from 230 commercial banks covering 38 African countries spanning the period from 2002 to 2015. We find that lending of African banks is procyclical for all types of banks. However, we observe that Pan-African banks are the least procyclical banks, while no significant difference in procyclicalities is observed between state-owned banks, domestic private banks, and other foreign banks. In addition, we find limited evidence that foreign banks are influenced by GDP per capita growth of their home country. Therefore, our findings support the view that the expansion of Pan-African banks contributes to reduce cyclicalities of lending. However, foreign bank entry can enhance the transmission of external shocks.

JEL Codes: G21, G32, N27.

Keywords: Africa, Bank, Loan growth, Business cycles, Financial stability, Pan-African banks.

¹⁴ This chapter refers to the article revised and resubmitted in *Emerging Markets Review* with Laurent Weill.

2.1. Introduction

African banking systems have remarkably and rapidly changed over the past two decades. A key change has been the evolution of the ownership structure of banks with liberalization and privatization reforms which have diminished the market share of state-owned banks and promoted foreign bank entry.

Foreign bank expansion on the African continent has taken place through the entry of banks from developed and developing countries but also through the emergence of Pan-African banks (PABs), which come from African countries. PABs have now become major banking players with a presence in 36 African countries and with the eight major PABs having activities in at least ten African countries.¹⁵ Moreover, major PABs have a large market share in several African countries going from 15 to 45 percent (Beck, Fuchs, Singer and Witte, 2014).¹⁶

The expansion of PABs raises questions about its implications for African countries. The scarce literature on this topic has analyzed its consequences on financial inclusion (Beck, 2015), bank competition (Léon, 2016), bank market power (Nguyen, Perrera and Skully, 2016), bank efficiency (Zins and Weill, 2017) and on the determinants of this expansion (Kodongo, Natto and Biekpe, 2015).

However, the impact of foreign bank entry on cyclicity of bank lending remains unexplored. Cyclicity of bank lending refers to the fact that banks would grant too many loans during economic booms and cut too much lending during economic downturns. As a consequence, a cyclical lending behavior would have undesirable effects by amplifying recessions and by generating excessive credit expansion leading to an overheating of the economy. It can therefore have major detrimental consequences for the economy.

Cyclicity of bank lending is a key question associated with the debate around foreign bank expansion since foreign banks can have a more cyclical lending behavior than domestic banks. The argument is that economic troubles of the host country can lead foreign banks to reduce lending more than domestic banks because of a “lack of loyalty” (Fungáčová, Herrala

¹⁵ According to Beck, Fuchs, Singer and Witte (2014), the eight major PABs are the Togolese Ecobank, the Nigerian United Bank for Africa, the Southern African Standard Bank Group, the Moroccan Banque Marocaine du Commerce Extérieur (BMCE), the Libyan Banque Sahélo-Saharienne pour l'Investissement et le Commerce (BSIC), the Moroccan Attijariwafa Bank, the Moroccan Groupe Banque Centrale Populaire du Maroc (GBCP) and the Southern African Barclays Africa Group.

¹⁶ In 2011, major PABs such as Ecobank, Standard Bank or BMCE own a market share from 15 to 45 percent in many African countries (Beck, Fuchs, Singer and Witte, 2014).

and Weill, 2013). Former literature has provided evidence in favor of a more cyclical behavior of foreign banks (e.g., De Haas and van Lelyveld, 2010, in European transition countries; Fungáčová, Herrala and Weill, 2013, in Russia; Bertay, Demirgüç-Kunt and Huizinga, 2013, in a worldwide study).

The objective of this paper is thus to examine whether the cyclical behavior of lending depends on bank ownership. We want first to know whether foreign banks have a different cyclical behavior in bank lending than domestic banks, second to find out whether PABs differ in cyclical behavior of bank lending from other non-African foreign banks.

To this end, we measure lending cyclical behavior by estimating the sensitivity of bank lending growth to GDP per capita growth of the host country. A greater sensitivity is associated with a more cyclical lending behavior. We use panel data from 230 commercial banks covering 38 African countries spanning the period from 2002 to 2015. Our dataset includes five groups of banks based on ownership: domestic privately-owned, domestic state-owned, Pan-African banks, banks owned by foreign developed investors, and banks owned by foreign developing investors. We are therefore able to compare lending behavior between all types of bank ownership in Africa.

We also investigate whether foreign banks have a lending behavior influenced by the business cycle in their home country. Namely, foreign banks can be more or less sensitive than domestic banks to the economic situation of the host country, but they can also contribute to transmit external shocks. We then estimate the sensitivity of bank lending for the foreign banks of our dataset to GDP per capita growth in their home country. We can then check if the business cycle in the home country exerts an influence on the lending behavior of foreign banks, and we can check whether Pan-African banks differ in this aspect from foreign banks from developed countries and from foreign banks from developing countries. This question is of major importance to assess the cross-border transmission of shocks.

Our main findings can be summarized as follows. First, lending of African banks is procyclical with loan growth positively linked to host GDP per capita growth. Second, Pan-African banks are the least procyclical banks among the five types of banks. Other foreign banks do not differ from domestic banks for cyclical behavior. Foreign bank entry does not enhance procyclical behavior of lending in Africa and may even diminish it through the expansion of Pan-African banks. Third, we observe limited evidence that foreign banks are influenced by

GDP per capita growth of their home country. This finding is observed for all types of foreign banks with no difference in the sensitivity to the business cycle in the home country. This finding therefore suggests that, to some extent, foreign banks in African countries can contribute to increase cross-border contagion since their lending behavior in the host country is sensitive to the economic situation in the home country.

Our contribution is threefold. First, we contribute to the burgeoning literature on African banks by examining how bank ownership influences cyclicity of lending behavior. We therefore provide important insights to assess how recent changes in the structure of the African banking markets can have macroeconomic effects.

Second, we provide a contribution to the literature on cyclicity of lending behavior. Several recent works have checked the link between bank ownership and cyclicity (e.g., Bertay, Demirgüç-Kunt and Huizinga, 2013, for state ownership; Behr, Foos and Norden, 2017, for banks with government involvement; Cull and Martínez Pería, 2013, for foreign banking). The unique feature of African banking markets with the coexistence of foreign banks from other continents and foreign banks from Africa combined with the absence of former works help us contributing to the better understanding of how bank ownership shapes cyclicity of lending.

Third, we add to the literature studying the sensitivity of foreign banks to home economic conditions (e.g. Popov and Udell, 2012; Kalemlı-Ozan et al., 2013; Iwanicz-Drozdowska and Witkowski, 2016). By synchronizing business cycles, foreign banks can increase contagion risks between home and host countries.

The remainder of this paper is organized as follows. Section 2 reviews the existing literature and the hypotheses. In Section 3 we describe the data and the empirical methodology. Section 4 presents our empirical findings. Section 5 concludes.

2.2. Background

This section is devoted to the background for our research question. We first provide theoretical and empirical elements from the literature on how bank lending reacts to the business cycle. We then present the hypotheses on how bank ownership can exert an impact on this relation.

2.2.1. Literature review

We briefly survey the literature related to our research question.

The first strand of literature concerns the theoretical elements with two recent models. Althammer and Haselmann (2011) show that foreign banks improve host banking systems' stability, particularly during economic downturns. Soft information loses reliability during recession and thus domestic banks lose their comparative advantage in comparison to foreign banks that resort more to hard information. Brei and Schlarek (2015) theorize that credit growth is comparable between state-owned and private banks during normal times but that state-owned banks would adopt a countercyclical role during recession times while private banks would be more procyclical. They give three explanations to such result. First, state-owned banks differ from private banks in terms of objectives: they aim at stabilizing the economy. Second, state-owned banks would be less hurt by deposit withdrawals thanks to a better access to recapitalization funds. Third, state-owned banks would suffer less from deposit withdrawals thanks to a higher trustworthiness in promising a future recapitalization.

The second strand of literature concerns empirical works on cyclicity of bank lending. We can survey these studies by considering separately cross-country studies gathering different groups of countries, studies on developed countries, and studies on developing and transition countries.

Concerning the cross-country works including different groups of countries, several works show that state-owned banks would be less pro-cyclical than their private counterparts (Micco and Panizza, 2006; Bertay, Demirgüç-Kunt and Huizinga, 2015) suggesting a credit smoothing role of state-owned banks.

State-owned banks' credit growth would however increase during election times, suggesting a political link (Dinç, 2005). In their study on 1633 banks in 111 countries covering the 1999-2010 period, Bertay, Demirgüç-Kunt and Huizinga (2015) also find that foreign-owned banks' lending is particularly procyclical. Regarding the lending pattern during the GFC, results are different. Studying over 21,000 banks located in 193 countries around the world, Dekle and Lee (2015) find no credit growth differences between state-owned banks and private banks during the GFC. However, Brei and Schlarek (2013), analyzing 764 banks in 50 countries, find that state-owned banks' lending increases during crises relative to normal times, whereas private-banks' lending declines, suggesting that public banks play an active

countercyclical role. Studying 45 multinational banks from 18 home countries implanted across 46 countries over the 1991-2004 period, De Haas and Lelyveld (2010) show that parent banks manage the lending growth of their subsidiaries through an internal capital market, meaning that subsidiaries and parent banks are financially linked. Dekle and Lee (2015) confirm that such internal capital market influences cross-border credit.

Concerning the empirical works in developed countries, Behr, Foos and Norden (2017) find that German banks with a public mandate are 25 percent less procyclical than other local banks because of differences in business objectives. Studying 12 Western European economies, Ferri, Kalmi and Kerola (2014) find that stakeholder banks' lending is less cyclical than shareholder banks' lending, confirming the idea that credit growth depends on banks' business objectives. Meriläinen (2016) shows that credit growth decreased in 18 Western European countries as a result of the financial crisis, but stakeholder banks reduced the negative impact of the crisis. Cooperative and public saving banks would stabilize Western European financial systems. Sapienza (2004) shows that Italian public banks' credit growth is linked to the electoral agenda, highlighting again the political objective state-owned banks may pursue.

Considering the empirical studies in developing and transition countries, Glen and Mondragon-Vélez (2011) study 22 developing economies over the 1996-2008 period and find that bank loan portfolio performance, measured with loan loss provisions, is driven by GDP growth. Ibrahim (2016) shows that Malaysian banks are procyclical and that Islamic banks are not more procyclical than their conventional counterparts and can even be countercyclical. Regarding the impact of the crisis, Fungáčová, Herrala and Weill (2013) show that Russian banks' lending decreased during the financial crisis. Foreign-owned banks' credit growth decreased more and state-owned banks' lending decreased less relative to domestic private banks. Studying Eastern European and Latin American banks over the 2004-2009 period, Cull and Martínez Pería (2013) find different results between both geographic areas. In Eastern Europe, foreign-owned banks reduced their credit supply more than domestic private banks while state-owned banks did not adopt a countercyclical behavior. In Latin America, however, state-owned banks were less procyclical than the other banks and less robust differences were found between foreign and domestic banks during the crisis. Such findings highlight the fact that the influence of bank ownership on lending is not homogenous across developing countries. Coleman and Feler (2015) find that Brazilian state-owned banks adopted a countercyclical behavior during a recession, but such lending pattern was politically oriented and raised

allocation inefficiency issues. Analyzing the behavior of foreign banks during financial crises in eight emerging European economies over the 2004-2010 period, Bonin and Louie (2017) separate foreign banks into two categories: “the Big 6 banks” – referring to subsidiaries of the Big 6 European multinational banks – versus the other foreign banks. They find that the non-Big 6 banks acted pro-cyclically and decreased their lending tremendously during the financial crisis. The Big 6 banks, however, staid committed to the region; their credit growth did not differ from that of domestic banks, supporting according the authors the idea that multinational banks consider their host countries as “second home markets”.

The third strand of literature concerns the sensitivity of foreign bank lending to home country situation and its impact on host economies. Iwanicz-Drozowska and Witkowski (2016) study the credit growth of foreign-owned banks in Central and Eastern European countries during the 2000-2014 period and find that both the parent bank situation and the home country macroeconomic context influence a subsidiary lending behavior. Such influence is amplified in the crisis and post-crisis periods. Popov and Udell (2012) confirm that the foreign parent banks’ situation influences subsidiaries’ lending in Central and Eastern Europe by analyzing the supply of credit to small and medium enterprises as a transmission channel. Studying a sample of 18/20 developed countries, Kalemlı-Ozcan (2013) show that global banks affected by financial shocks played a key role in spreading the 2008 global financial crisis. Such result is confirmed by De Haas and van Lelyveld (2014) who demonstrate that the 48 largest multinational banks play a stabilizing effect in normal times but contributed to spreading financial shocks by cutting their subsidiaries’ lending during the GFC. Focusing on Central and Eastern European countries for the 1994-2010 period, Allen et al. (2017) show that the type of crisis – namely, host, home, global and simultaneous crisis – shapes the impact of ownership structure on a bank’s lending behavior. Finally, Dekle and Lee (2015) show that the level of sovereign debt in the country where a foreign bank is headquartered influences its lending behavior.

The final strand of literature we want to briefly describe deals with African banking systems. Studies investigating these systems remain scarce. Akinboade and Makina (2010) study the relation between bank lending and the business cycle in South Africa during the 1980-2005 period and find that South African banks’ credit growth is procyclical. Ftiti, Kablan and Guesmi (2016) realize a study in Burkina Faso, Côte d’Ivoire and Niger on the period 1980-2013 and find a robust relationship between credit to the private sector and commodities on the

long term, suggesting that lending is sensitive to commodity shocks. Dwumfour (2017) analyzes banking stability in 32 Sub-Saharan African countries from 2000 to 2014. He shows that an important presence of foreign-owned banks weakens stability in normal times, but foreign-owned banks would help stabilizing African banking sectors during crises periods. Allen and Giovannetti (2011) study the transmission channels of the global financial crisis to 46 Sub-Saharan African countries and find that trade is the main direct channel followed by intra-African remittances. Concerning the financial sector, they find that banking sectors dominated by foreign banks suffered more (highlighting Mozambique, Swaziland and Madagascar) and that the most integrated financial markets – South Africa, Kenya, Ghana and Nigeria – endured a direct impact and propagated the adverse spill-overs to neighboring countries.

2.2.2. Hypotheses

We now derive hypotheses from the literature.

We first focus on the cyclicity of foreign banks relative to domestic banks.

There are two arguments from the literature supporting a greater cyclicity of foreign banks. First, these banks resort more on hard information and less on relationship lending. Empirical works tend to show that banks employing soft information are less procyclical (Ferri, Kalmi and Kerola, 2014; Meriläinen, 2016). Second, foreign banks would reduce lending more than domestic banks during economic troubled times because of a “lack of loyalty” (Fungáčová, Herrala and Weill, 2013).

Hypothesis 1a: Foreign banks’ lending is more cyclical than domestic privately-owned banks’ lending.

However, three arguments are in favor of the opposing view. First, foreign banks can benefit from parental support. In times of economic difficulties in the host country, the subsidiary can rely on the parent bank to give financial support that allows the foreign bank to keep its activities normally. Moreover, foreign banks are dependent on the internal capital market, and internal capital market might be little or even not sensitive to the host macroeconomic conditions. Second, well-established foreign banks may consider the host country as a “second home market” (Bonin and Louie, 2017). Because of the importance they

play in the host market, such banks have incentives to stay committed during financial turmoil. Third, following Althammer and Haselmann (2011), foreign banks would be less affected than domestic banks by economic downturns since they resort more to hard information. In opposition, soft information more utilized by domestic banks would become less reliable during troubled times.

Hypothesis 1b: Foreign banks' lending is less cyclical than domestic privately-owned banks' lending.

We turn to the comparison between PABs and other foreign banks. As shown by Bonin and Louie (2017), foreign banks can differ in terms of lending behavior. PABs, foreign banks from developed countries and foreign banks from developing countries can therefore adopt a different lending pattern. PABs expanded their activities aggressively and recently (Beck et al., 2014). Their main development started in the mid-2000s, whereas foreign banks from the developed countries are established for a longer time. Such rapid and relatively new expansion could lead to less loyal banks and thus more pro-cyclical behaviors.

In addition, parent banks from developed countries can have a larger internal capital market than those from African countries, leading to lower sensitivity of foreign banks from developed countries to host country economic conditions.

Hypothesis 2a: Pan-African banks are more procyclical than other foreign banks.

However, according to Beck et al. (2014), PABs resort to local labor, local IT functions and local management functions, leading to an “indigenization process”. Thanks to such process, PABs can build more relationship lending than the other foreign banks. Moreover, according to Nguyen, Perera and Skully (2016), PABs have a different business model as they focus more on traditional intermediation activities and less on revenue diversification in comparison to other foreign banks in Africa. Such different business model may lead to the use of more soft information. Relationship lending and the use of soft information lead to less procyclical behaviors (Ferri, Kalmi and Kerola, 2014; Meriläinen, 2016).

Hypothesis 2b: Pan-African banks are less procyclical than other foreign banks.

Former literature on cyclicity of state-owned banks helps us deriving hypotheses for state-owned banks relative to domestic private banks. State-owned banks have different objectives leading them to support the economy during economic turmoil through lending boost

(Bertay, Demirgüç-Kunt and Huizinga; 2015; Behr, Foos and Norden, 2017). In addition, state-owned banks' lending behavior can be influenced by political motivations to preserve social stability in particular during troubled times (Sapienza, 2004; Dinç, 2005). We thus expect the government involvement in banks to lead to a less procyclical behavior than domestic private banks.

Hypothesis 3: State-owned banks are less procyclical than domestic private banks.

Finally, we consider the sensitivity of lending by foreign banks to the business cycle in their home country. We expect that lending by foreign banks is positively influenced by home-country economic conditions for two reasons. First, the internal capital market influences the lending behavior (Dekle and Lee, 2015). We thus expect foreign banks' credit behavior to be sensitive to home GDP per capita growth as the parent bank's situation can spread through the internal capital market. The internal capital market allows parent banks to expand financial support in times of home economic booms and to shorten it during financial downturns. Second, economic situation in the home country of the foreign bank can influence decisions at the banking group level and can therefore contribute to affect the lending policy of the foreign bank in the host country.

Hypothesis 4: Foreign banks' lending in Africa is sensitive to home-country business cycle.

2.3. Data and methodology

2.3.1. Data

Our analysis is based on an unbalanced panel of 230 commercial banks covering 38 African countries for the period going from 2002 to 2015. Unconsolidated accounting level data are from Bureau van Dijk's Bankscope database and macroeconomic data are from World Development Indicators database from the World Bank. We built a comprehensive database indicating the ownership structure of each bank for every year. Ownership information was collected from Bankscope database and from websites and annual reports of banks and central banks.

A bank is considered as foreign if a foreign organization is the first shareholder or if the majority of the shares is controlled by foreign companies. The same definition applies for the other ownership types. We distinguish foreign banks between those owned by African investors, by investors from developed countries, and by investors from other developing countries¹⁷.

Five ownership types coexist in our sample, corresponding to five dummies: *Pan African*, *Foreign Developed*, *Foreign Developing*, *Domestic Private*, and *Public*. If there is a merger or acquisition in year t , we include it from year $t+1$ onwards in our database. Our dependent variable is loan growth, defined as the change of bank i 's total net loans in real US dollars from the year $(t-1)$ to the year t as follows:

$$\frac{\text{Total Loans } (t)_i - \text{Total Loans } (t - 1)_i}{\text{Total Loans } (t - 1)_i}$$

We winsorize loan growth at the 5% and 95% percentile in order to remove the outliers in line with Behr, Foos and Norden (2017)¹⁸. We keep only banks for which we have three-year observations available.

The explanatory variable of interest is the host GDP per capita growth rate and is an indicator of the business cycle. We test the alternative use of the GDP growth rate as a robustness check. In the additional estimations on foreign banks, we consider home GDP per capita growth rate as the main explanatory variable to test its influence on the lending behavior of foreign banks in the host country.

We include three bank-level control variables in line with former literature (Ferri, Kalmi and Kerola, 2014). The first is *Bank Size* defined as the log of total assets. Its expected sign is ambiguous. On the one hand, large banks can be in a better position to face economic downturns in the host country thanks to a greater diversification. On the other hand, small banks can be less hampered in times of financial turmoil because they resort more to relationship lending (Brei and Schclarek, 2015). The second is *Bank Soundness*, measured by the ratio of equity to total assets, while the third is *Liquidity* defined as the ratio of liquid assets to total assets. Controlling for liquidity is even more important since banks in Africa hold a large amount of

¹⁷ For the classification of the countries, see Appendix 2.2.

¹⁸ We also realize the estimations by dropping the 5% and 95% percentiles in order to remove the outliers. Results are consistent and can be obtained on request.

liquidity (Nketcha, Nana and Samson, 2013). The impact of both latter variables on loan growth is ambiguous. On the one hand, banks that are more capitalized and that hold higher amounts of liquidity may have more funds available for lending, especially in times of crisis. On the other hand, undercapitalized and less liquid banks may be subject to moral hazard and aggressive lending behaviors (Allen et al., 2017).

We control for macroeconomic conditions with two country-level variables: *Inflation* and *GDP per Capita*. Inflation and GDP per capita have been log-transformed to curtail the effects of extreme values. Finally, following Allen et al. (2017), we create a dummy variable *Global Crisis* that equals one for the years 2008, 2009 and 2010 to control for the impact of the crisis on banks' lending behavior in our third robustness check.

Table 2.1. provides descriptive statistics for our sample, while Table 2.2. displays a comparison of the balance sheet variables by ownership type.

2.3.2. Methodology

Following empirical studies on banks' cyclicity (Bertay, Demirgüç-Kunt and Huizinga, 2015; Ibrahim, 2016; Behr, Foos and Norden, 2017; Allen, Jackowicz, Kowalewski and Kozłowski, 2017), we estimate the following equation with data on bank *i* in country *j* in year *t*:

$$\begin{aligned}
Credit_{Growth_{i,j,t}} &= \alpha + \sigma Credit_{Growth_{i,j,t-1}} + \beta_1 HostGDPperCapita_{Growth_{j,t}} + \beta_2 PAB_{i,j,t} \\
&+ \beta_3 (PAB * HostGDPperCapita_{Growth})_{i,j,t} + \beta_4 Developed_{i,j,t} \\
&+ \beta_5 (Developed * HostGDPperCapita_{Growth})_{i,j,t} + \beta_6 Developing_{i,j,t} \\
&+ \beta_7 (Developing * HostGDPperCapita_{Growth})_{i,j,t} + \beta_8 Public_{i,j,t} \\
&+ \beta_9 (Public * HostGDPperCapita_{Growth})_{i,j,t} + \delta B_{i,j,t-1} + \gamma W_{j,t} \\
&+ YEARdummy_t + COUNTRYdummy_j + \varepsilon_{i,j,t}
\end{aligned}$$

The loan growth rate is regressed on the real GDP per capita growth rate in order to estimate procyclicality: a positive and significant coefficient β_1 is associated with procyclicality of African banks.

To examine the differences in cyclicity across ownership types, we add interaction terms between the real GDP per capita growth rate and ownership dummy variables. For example, we put the dummy variable $PAB_{i,j,t}$, which is equal to one if the bank is Pan-African and zero otherwise, and we interact this dummy with the GDP per capita growth rate $(PAB \times HostGDPperCapitaGrowth)_{i,j,t}$. We do it for each ownership type by considering domestic private banks as the omitted category. Therefore, the coefficients of the interaction terms provide information on the differences in cyclicity between domestic private banks and each other ownership type.

The one-period-lagged dependent variable is included to capture potential dynamics in real lending. In order to address endogeneity issues and fixed effects problems, we employ a dynamic System-GMM panel estimator (Arellano and Bover, 1995; Blundell and Bond, 1998) using lagged first differences as instruments. We use two-step GMM estimation and the Windmeijer (2005) correction to minimize the downward bias in standard errors¹⁹. We evaluate the appropriateness of our GMM estimations and of our instruments with the Hansen test of over-identifying restrictions and the Arellano-Bond tests for error autocorrelation (Arellano and Bond, 1991). For all our results discussed later, the Hansen and the Arellano-Bond AR(2) tests confirm the appropriateness of our instruments and detect no second-order serial correlation.

The vector $B_{i,j,t-1}$ consists of bank-level control variables, all lagged one year to alleviate a possible endogeneity problem. We also include macroeconomic control variables in the vector $W_{j,t}$. In some specifications, we include year dummies to capture year specific economic conditions ($YEARdummy_t$) and country dummies ($COUNTRYdummy_j$).

Our second range of estimations aims at determining whether foreign banks' lending behavior is sensitive to the home country macroeconomic situation. To study this issue, we realize our empirical work only on the 131 foreign banks from our sample. We use the following regression:

¹⁹ The one-step GMM estimation has also been realized and gives the same results but is not in the paper for consistency.

$$\begin{aligned}
& \text{Credit}_{Growth_{i,j,t}} \\
& = \alpha + \sigma \text{Credit}_{Growth_{i,j,t-1}} + \beta_1 \text{HomeGDPperCapita}_{Growth_{j,t}} \\
& + \beta_2 \text{HostGDPperCapita}_{Growth_{i,j,t}} + \beta_3 \text{Developed}_{i,j,t} \\
& + \beta_4 (\text{Developed} * \text{HomeGDPperCapita}_{Growth})_{i,j,t} + \beta_5 \text{Developing}_{i,j,t} \\
& + \beta_6 (\text{Developing} * \text{HomeGDPperCapita}_{Growth})_{i,j,t} + \delta B_{i,j,t-1} + \gamma W_{j,t} \\
& + \text{YEARdummy}_t + \text{COUNTRYdummy}_j + \varepsilon_{i,j,t}
\end{aligned}$$

$\text{HomeGDPperCapita}_{Growth_{j,t}}$ is the GDP per capita growth rate in the country where the parent bank is headquartered. We interact this variable with dummy variables for foreign banks from developed countries and from developing countries, meaning that the omitted category is Pan-African banks. The coefficient β_1 measures the lending' cyclicalities of foreign banks in Africa relative to their home country situation. β_4 and β_6 measure whether a different behavior exists between PABs and other foreign banks in terms of sensitivity to the home country economic situation.

2.4. Results

2.4.1. Baseline results

Table 2.3. shows the baseline results. In odd-numbered columns, we include all the ownership dummies and their interaction terms with *Host GDP per Capita Growth*, domestic private banks being the omitted category. In even-numbered columns, we only include *Pan-African* and *PAB x Host GDP per Capita Growth*, in order to compare PABs to the rest of the banks in our sample. The results for the AR(2) and Hansen tests confirm the validity of our instrumentation for all the regressions.

We provide alternative specifications to test the sensitivity of the results. Columns (1) and (2) display estimations without control variables, country fixed effects, and year fixed effects. Columns (3) and (4) add control variables. Columns (5) and (6) add control variables and year fixed effects. Columns (7) and (8) add control variables and country fixed effects. Columns (9) and (10) include control variables, country fixed effects, and year fixed effects. Several conclusions emerge.

First, we find evidence of procyclicality of lending for African banks. The coefficient of *Host GDP per Capita Growth* is significantly positive in all estimations, showing that loan growth evolves with the business cycle.

Second, we show that Pan-African banks are less cyclical than domestic private banks. Namely the interaction term *Pan-African × Host GDP per Capita Growth* is significantly negative in nine of the ten estimations. We therefore provide support for the hypothesis 2b.

Third, we observe no difference in cyclicity for foreign banks from developed countries, foreign banks from developing countries, and state-owned banks with domestic private banks. Interaction terms of dummy variables *Foreign Developed*, *Foreign Developing*, and *Domestic Public*, with *Host GDP per Capita Growth* are not significant (with one exception for *Foreign Developed* and for *Domestic Public*) in the estimations.

Hence, we do not find evidence supporting neither the hypothesis 1a, nor the hypothesis 1b. There is no systematic difference in cyclicity between foreign banks and domestic private banks.

The finding of no different lending behavior between state-owned banks and domestic private banks contributes to reject our hypothesis 3: state-owned banks do not adopt a different lending behavior than domestic private banks in Africa. It differs from the findings of Micco and Panizza (2006), Bertay, Demirgüç-Kunt and Huizinga (2015) and Behr, Foos and Norden (2017) who find that state-owned banks are less procyclical. It suggests that the situation would be different on this question in Africa.

Both latter findings therefore support the view that PABs are the least cyclical banks among the different bank ownership types of African banks. How can we explain this conclusion?

First, the fact that PABs are less cyclical than other foreign banks can result from their “indigenization process” as developed by Beck et al. (2014) with a greater use of local labor, local IT functions and local management functions. This process helps PABs using more soft information which can favor lower procyclicality.

Second, the fact that PABs are also less cyclical than domestic banks, private and state-owned, can be explained by the importance of PABs in several African countries. As explained before, the market share of PABs can be very high in many cases. This situation leads the parent

bank to consider the host country as a “second home market” (Bonin and Louie, 2017). As a consequence, these banks have incentives to be “loyal” to the host country during recessions. In addition, PABs can benefit from parental support like all foreign banks and as such can use an internal capital market which makes them less sensitive to host country business cycle.

These latter arguments explain why we do not observe greater cyclicity for foreign banks in general in Africa. But PABs combine these reasons with the “indigenization process” allowing them to be the least cyclical banks.

The conclusion that PABs are the least cyclical banks is of utmost interest in terms of implications. It suggests that the expansion of these banks can contribute to reduce cyclicity of lending behavior and can therefore diminish the amplification of the business cycle.

This finding does not mean that Pan-African banks are not procyclical. In all estimations, the overall effect of *Host GDP per Capita Growth* on loan growth of Pan-African banks is positive. For instance, if we consider the column (1), the global effect of *Host GDP per Capita Growth* is the sum of the coefficient of this variable and the coefficient of the interaction term between this variable and PAB which is equal to $3.540 - 2.454 = 1.086$.

The analysis of control variables shows a negative and significant coefficient for bank size in all estimations, suggesting that smaller banks have higher credit growth. This result is in line with the findings of Bertay, Demirgüç-Kunt and Huizinga (2015), Brei and Schclarek (2013) and Ibrahim (2016) for other geographic samples. It may be explained by the fact that smaller banks succeed in expanding lending thanks to relationship lending and the higher use of soft information. Liquidity is significantly positive in all regressions, suggesting that banks holding more liquid assets have a higher credit growth in Africa. This finding is at odds with Allen et al. (2017) in Central and Eastern Europe and with Ferri, Kalmi and Kerola (2014) in the Euro area, who find that more liquid banks lend less. Finally, bank soundness is not significant in all estimations. It accords with the findings of Bertay, Demirgüç-Kunt and Huizinga (2015) and Ibrahim (2016) who do not observe any link between this variable and credit growth.

2.4.2. Sensitivity of foreign banks to home country growth

We test now the hypothesis that home country economic growth exerts an influence on lending behavior of foreign banks. We therefore restrict our analysis to the sample of foreign banks. *Foreign Developed* and *Foreign Developing* dummy variables are interacted with *Home GDP per Capita Growth*, with PABs being the omitted category.

Table 2.4. displays the estimations. We test again several specifications to check the sensitivity of our results. In column (1), we adopt the specification without control variables, year dummy variables, and country dummy variables. In column (2), we add control variables. In column (3), we include control variables and year dummy variables. In column (4), we include control variables and country dummy variables. In column (5), we include control variables, year dummy variables, and country dummy variables. The Hansen tests and the AR(2) tests validate our empirical model in all specifications.

We find some evidence that home country economic growth influences the lending behavior of foreign banks in host countries. *Home GDP per Capita Growth* is positive in all five estimations, and significant in two of them. We thus obtain some limited support for the hypothesis 4 according to which foreign bank's lending is sensitive to home country business cycle in Africa. It accords with the findings of Iwanicz-Drozowska and Witkowski (2016) that the home country macroeconomic context influences subsidiaries' lending behavior.

Furthermore, we observe no difference in the sensitivity to home country growth between the three types of foreign banks: *Developed* \times *Home GDP per Capita Growth* and *Developing* \times *Home GDP per Capita Growth* are not significant in all estimations. Therefore Pan-African banks do not differ from foreign banks from developed countries and from developing countries in this aspect.

For the rest, we still observe a significantly positive coefficient for *Host GDP per Capita Growth* in all estimations, confirming the procyclical behavior of foreign banks in Africa. The comparison of the results for *Home GDP per Capita Growth* and *Host GDP per Capita Growth* shows that foreign banks are more sensitive to growth in the host country than in the home country.

To sum it up, these estimations show that lending behavior of all foreign banks are sensitive to home country economic conditions and may therefore contribute to transmit

external shocks to the host country. However, this potential drawback of foreign bank entry should not be overestimated since this sensitivity is not significant in all estimations and since it is weaker than the sensitivity of lending behavior of foreign banks to host country growth.

2.4.3. Robustness checks

We perform three robustness checks. In each case, we redo first the baseline estimations in a first table, then the sensitivity of foreign banks to home country business cycle in a second table.

First, we check whether our main findings are still observed when replacing GDP per capita growth rate with GDP growth rate as a measure of the business cycle. Tables 2.5. and 2.6. display the estimations. They confirm our main results. First, banks in Africa are procyclical since *Host GDP Growth* is significantly positive in all estimations in Table 2.5. Second, PABs are less procyclical than domestic private banks since $PAB \times Host\ GDP\ Growth$ is significant and negative in most estimations in Table 2.5. Third, foreign banks are sensitive to the home macroeconomic situation since *Home GDP Growth* is significantly positive in three regressions in Table 2.6. Finally, no difference is observed in the sensitivity of foreign banks to home GDP growth since $Developed \times Home\ GDP\ Growth$ and $Developing \times Home\ GDP\ Growth$ are not significant.

Second, we add three control variables to test the sensitivity of our findings to the set of control variables: loans to other earning assets, deposits growth and ROAA. Tables 2.7. and 2.8. report the estimations. Our main results are confirmed. In table 2.7., *GDP per Capita Growth* is significantly positive in the 4 estimations and $PAB \times GDP\ per\ Capita\ Growth$ is significantly negative in 3 estimations, confirming that African banks are procyclical but PABs are less procyclical. In table 2.8., *Home GDP per Capita Growth* and *Host GDP per Capita Growth* are significantly positive in all regressions, confirming that foreign banks are sensitive to both home and host macroeconomic situations. Finally, no difference is observed in the sensitivity of foreign banks to home GDP per capita growth.

Third, we check whether the global financial crisis influences the results. To this end, we add the dummy variable *Global Crisis*, which is equal to one for the years 2008, 2009 and 2010 following Allen et al. (2017) and the interaction terms between each ownership type and *Global*

Crisis to capture differences in responses to the crisis following Bertay, Demirgüç-Kunt and Huizinga (2015). Table 2.9. reports the estimations for the cyclicity of lending. We observe that *Global Crisis*, *Developing × Global Crisis*, *PAB × Global Crisis*, and *Public × Global Crisis* are not significant in all estimations. Only the negative coefficient of *Developed × Global Crisis* is significant in all estimations. Therefore, these results mean that the GFC has no impact on lending for all types of banks with the exception of foreign banks from developed countries which reduced their lending during that period.

The finding for foreign banks from developed countries is in line with what has been found for foreign banks in other papers: Fungáčová, Herrala and Weill (2013) in Russia and Cull and Martínez Pería (2013) in Eastern Europe also find that foreign banks' credit growth decreased more during the GFC relative to domestic private banks. The absence of different lending behavior for state-owned banks during the GFC is in line with Dekle and Lee (2015) in their worldwide study, but differs from Brei and Schclarek (2013), Funcagova, Herrala and Weill (2013) and Coleman and Feller (2015) who find a countercyclical behavior.

The fact that state-owned banks did not increase lending during the crisis to support the economic activity may come from the fact that they did not have to compensate any credit downturn in Africa since only foreign banks from developed countries reduce their lending. In addition, state-owned banks play a minor role in African countries in most cases, which is a major difference with other countries like for instance Russia. As such, their influence to support the economy can make them not relevant for the authorities.

Table 2.10. displays the estimations for the sensitivity of foreign banks to home country business cycle. We find that *Global Crisis*, *Developing × Global Crisis*, and *Developed × Global Crisis* are not significant in most estimations. For the rest, we observe the same findings than in the main estimations with a significantly positive coefficient for *Home GDP per Capita Growth* in two estimations and for *Host GDP per Capita Growth* in all estimations.

In a nutshell, these estimations tend to show no impact of the global financial crisis on our main findings.

2.5. Conclusion

The expansion of foreign banks in Africa raises questions about its economic consequences for the host countries. In this paper we investigate how bank ownership influences the cyclicity of lending in Africa. Cyclicity of lending is a major issue since greater cyclicity of banks contributes to amplify economic booms and busts and is therefore detrimental for the economy.

Our findings can be summarized as follows. First, we find evidence of procyclicality of lending for African banks. Second, we observe differences in cyclicity across ownership types of banks: Pan-African banks are the least procyclical banks. Other foreign banks do not differ in cyclicity from domestic private banks and state-owned banks. Third, we find limited evidence that all types of foreign banks are influenced by GDP growth of their home country.

Evidence that African banks are procyclical and that foreign banks are sensitive to home country economic conditions is in line with what has been observed in former literature in other regions of the world. However, the key findings on the link between bank ownership and cyclicity differ from what studies tend to show with greater cyclicity of foreign banks (e.g., Bertay, Demirgüç-Kunt and Huizinga, 2013).

We explain the fact that foreign banks are not more cyclical than domestic banks in Africa by the fact that parent banks consider the host country as a “second home market” (Bonin and Louie, 2017), notably because of the strong involvement in the host country in many cases, and by their access to an internal capital market.

Lower cyclicity of PABs can then be explained by the fact that these banks combine characteristics of domestic banks and of foreign banks. In addition to the characteristics of foreign banks just mentioned, they resort to local resources through an “indigenization process” and as such rely more on soft information in their lending behavior like domestic banks.

These findings have several policy implications. They support the view that the expansion of PABs contributes to reduce cyclicity of lending. As a consequence, favoring the entry of PABs is beneficial for stabilizing the economy. Moreover, they show that foreign bank entry as a whole does not lead to greater cyclicity for African countries. However, foreign bank entry can contribute to enhance the transmission of external shocks since these banks are sensitive to the business cycle of the home country.

References

- African Development Bank, 2009. Africa and the Global Economic Crisis: Strategies for Preserving the Foundations of Long-term Growth. Presented at the 2009 Annual Meetings of the African Development Bank, Dakar, Senegal.
- Akinboade, O.A., Makina, D., 2010. Econometric Analysis of Bank Lending and Business Cycles in South Africa. *Applied Economics* 42, 3803–3811.
- Allen, F., Giovannetti, G., 2011. The Effects of the Financial Crisis on Sub-Saharan Africa. *Review of Development Finance* 1, 1–27.
- Allen, F., Jackowicz, K., Kowalewski, O., Kozłowski, Ł., 2017. Bank Lending, Crises, and Changing Ownership Structure in Central and Eastern European Countries. *Journal of Corporate Finance* 42, 494–515.
- Althammer, W., Haselmann, R., 2011. Explaining Foreign Bank Entrance in Emerging Markets. *Journal of Comparative Economics* 39, 486–498.
- Arellano, M., Bond, S. 1991. Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *Review of Economic Studies* 58, 277-297.
- Arellano, M., Bover, O. 1995. Another Look at the Instrumental-Variable Estimation of Error-Components. *Journal of Econometrics* 68, 29-52.
- Beck, T., 2015. Cross-Border Banking and Financial Deepening: The African Experience. *Journal of African Economies* 24, 32–45.
- Beck, T., Cull, R., Jerome, A., 2005. Bank Privatization and Performance: Empirical Evidence from Nigeria. *Journal of Banking and Finance* 29, 2355–2379.
- Beck, T., Fuchs, M., Singer, D., Witte, M., 2014. Making Cross-Border Banking Work for Africa. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and International Bank for Reconstruction and Development / The World Bank.
- Behr, P., Foos, D., Norden, L., 2017. Cyclicity of SME Lending and Government Involvement in Banks. *Journal of Banking and Finance* 77, 64–77.
- Bertay, A.C., Demirgüç-Kunt, A., Huizinga, H., 2015. Bank Ownership and Credit over the Business Cycle: Is Lending by State Banks Less Procyclical? *Journal of Banking and Finance* 50, 326–339.
- Blundell, R. Bond, S., 1998. Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. *Journal of Econometrics* 87, 115-143.
- Bonin, J.P., Louie, D., 2017. Did Foreign Banks Stay Committed to Emerging Europe during

- Recent Financial Crisis? *Journal of Comparative Economics* 45, 4, 793-808.
- Brei, M., Schclarek, A., 2013. Public Bank Lending in Times of Crisis. *Journal of Financial Stability* 9, 820–830.
- Brei, M., Schclarek, A., 2015. A Theoretical Model of Bank Lending: Does Ownership Matter in Times of Crisis? *Journal of Banking and Finance* 50, 298–307.
- Clarke, G.R.G., Cull, R., Fuchs, M., 2009. Bank Privatization in Sub-Saharan Africa: The Case of Uganda Commercial Bank. *World Development* 37, 1506–1521.
- Coleman, N., Feler, L., 2015. Bank Ownership, Lending, and Local Economic Performance during the 2008–2009 Financial Crisis. *Journal of Monetary Economics* 71, 50–66.
- Cull, R., Martínez Pería, M.S., 2013. Bank Ownership and Lending Patterns during the 2008–2009 Financial Crisis: Evidence from Latin America and Eastern Europe. *Journal of Banking and Finance* 37, 4861–4878.
- Cull, R., Spreng, C.P., 2011. Pursuing Efficiency while Maintaining Outreach: Bank Privatization in Tanzania. *Journal of Development Economics* 94, 254–261.
- De Haas, R., van Lelyveld, I., 2010. Internal Capital Markets and Lending by Multinational Bank Subsidiaries. *Journal of Financial Intermediation* 19 1–25.
- De Haas, R., van Lelyveld, I., 2014. Multinational Banks and the Global Financial Crisis: Weathering the Perfect Storm. *Journal of Money, Credit and Banking* 46, 333–64.
- Dekle, R., Lee, M., 2015. Do Foreign Bank Affiliates Cut their Lending More than the Domestic Banks in a Financial Crisis? *Journal of International Money and Finance* 50, 16–32.
- Dinç, I.S., 2005. Politicians and Banks: Political Influences on Government-Owned Banks in Emerging Markets. *Journal of Financial Economics* 77, 453–479.
- Dwumfour, R.A., 2017. Explaining Banking Stability in Sub-Saharan Africa. *Research in International Business and Finance* 41, 260–279.
- Ferri, G., Kalmi, P., Kerola, E., 2014. Does Bank Ownership Affect Lending Behavior? Evidence from the Euro Area. *Journal of Banking and Finance* 48, 194–209.
- Ftiti, Z., Kablan, S., Guesmi, K., 2016. What Can We Learn About Commodity and Credit Cycles? Evidence from African Commodity-Exporting Countries. *Energy Economics* 60, 313–324.
- Fungáčová, Z., Herrala, R., Weill, L., 2013. The Influence of Bank Ownership on Credit Supply: Evidence from the Recent Financial Crisis. *Emerging Markets Review* 15, 136–147.
- Glen, J., Mondragón-Vélez, C., 2011. Business Cycle Effects on Commercial Bank Loan Portfolio Performance in Developing Economies. *Review of Development Finance* 1,

150–165.

- Ibrahim, M.H., 2016. Business Cycle and Bank Lending Procyclicality in a Dual Banking System. *Economic Modelling* 55, 127–134.
- Iwanicz-Drozdowska, M., Witkowski, B., 2016. Credit Growth in Central, Eastern, and South-Eastern Europe: The Case of Foreign Bank Subsidiaries. *International Review of Financial Analysis* 43, 146–158.
- Kalemli-Ozcan, S., Papaioannou, E., Perri, F., 2013. Global Banks and Crisis Transmission. *Journal of International Economics* 89, 495–510.
- Kodongo, O., Natto, D., Biekpe, N., 2015. Explaining Cross-Border Bank Expansion in East Africa. *Journal of International Financial Markets, Institutions and Money* 36, 71–84.
- Léon, F., 2016. Does the Expansion of Regional Cross-Border Banks Affect Competition in Africa? Indirect Evidence. *Research in International Business and Finance* 37, 66–77.
- Meriläinen, J.-M., 2016. Lending Growth during the Financial Crisis and the Sovereign Debt Crisis: The Role of Bank Ownership Type. *Journal of International Financial Markets, Institutions and Money* 41, 168–182.
- Micco, A., Panizza, U., 2006. Bank Ownership and Lending Behavior. *Economics Letters* 93, 248–254.
- Nguyen, M., Perera, S., Skully, M., 2016. Bank Market Power, Ownership, Regional Presence and Revenue Diversification: Evidence from Africa. *Emerging Markets Review* 27, 36–62.
- Nketcha Nana, P.V., Samson, L., 2014. Why Are Banks in Africa Hoarding Reserves? An Empirical Investigation of the Precautionary Motive. *Review of Development Finance* 4, 29–37.
- Popov, A., Udell, G., 2012. Cross-border Banking, Credit Access, and the Financial Crisis. *Journal of International Economics* 87, 147–161.
- Sapienza, P., 2004. The Effects of Government Ownership on Bank Lending. *Journal of Financial Economics* 72, 357–384.
- Windmeijer, F., 2005. A Finite Sample Correction for the Variance of Linear Efficient Two-Step GMM Estimators. *Journal of Econometrics* 126, 25–51.
- Zins, A. and Weill, L., 2017. Do Pan-African Banks Have the Best of Both Worlds? LaRGE Working Paper, 2017-05.

Tables

Table 2.1. Descriptive statistics

This table indicates the mean values, standard deviations, minimum and maximum values for the variables used in our empirical work for the full sample. All statistics are computed for observations over the period 2002-2015.

Variable	Obs	Mean	Std Dev	Min	Max
Credit Growth (%)	1907	19.263	27.149	-16.469	90.041
Equity	2137	328,513	837,653	-173,013	8,307,651
Total Assets	2137	3,888,411	12,200,000	10,227	12,700,000
Loans	2137	2,131,504	7,875,480	1,484	74,440,403
Liquid Assets	2137	792,639	2,182,918	2,149	26,637,083
Deposits and Short-Term Funding	2137	3,086,167	9,544,633	5,246	92,900,000
ROAA (%)	2136	1.711	2.195	-26.533	16.031
Lagged Size	1907	13.784	1.446	9.233	18.658
Lagged Bank Soundness (%)	1907	10.691	5.614	-15.555	83.210
Lagged Liquidity (%)	1907	28.034	16.760	1.620	91.371
Lagged Deposits Growth (%)	1677	23.692	62.375	-79.209	1271.922
Lagged Loans to Other Earning Assets (%)	1907	213.156	177.548	33.476	715.387
Lagged ROAA (%)	1906	1.716	2.234	-26.533	16.031
Domestic Public Bank	2137	0.104	0.306	0	1
Domestic Private Bank	2137	0.328	0.470	0	1
Foreign Developed Bank	2137	0.210	0.407	0	1
Foreign Developing Bank	2137	0.064	0.245	0	1
Pan-African Bank	2137	0.293	0.455	0	1
Host GDP per Capita Growth (%)	2135	2.699	3.252	-15.248	33.576
Host GDP Growth (%)	2135	5.003	3.516	-12.674	37.999
Host GDP per Capita	2135	2,597.403	2,420.168	111.531	23,347.66
Host Inflation (%)	2141	7.830	9.221	-3.100	108.897
Home GDP per Capita Growth (%)	1198	1.164	3.339	-62.214	11.186
Home GDP Growth (%)	1212	2.814	3.513	-62.076	13.016
Global Crisis	2137	0.237	0.425	0	1

Table 2.2. Descriptive statistics by ownership type

Mean values are indicated for each ownership type with standard deviations in parentheses below.

Variable	Pan-African Banks	Foreign Developed Banks	Foreign Developing Banks	Domestic Private Banks	Domestic Public Banks
Credit Growth (%)	19.913 (28.503)	15.699 (25.283)	16.106 (22.069)	21.329 (27.912)	19.992 (26.482)
Lagged Size	13.194 (1.033)	13.677 (1.030)	13.816 (1.071)	14.097 (1.807)	14.708 (1.359)
Lagged Bank Soundness	9.918 (5.927)	11.21 (4.834)	12.896 (7.432)	11.293 (5.343)	8.526 (4.757)
Lagged Liquidity (%)	29.181 (16.918)	30.575 (17.428)	27.497 (15.572)	24.471 (15.041)	29.133 (19.377)
Lagged Loans to Other Earning Assets (%)	193.97 (141.446)	209.119 (172.763)	191.476 (206.579)	233.203 (184.663)	226.76 (226.743)
Lagged Deposits Growth (%)	25.822 (59.318)	18.366 (37.838)	30.907 (130.267)	26.439 (66.844)	15.343 (24.464)
Lagged ROAA (%)	1.627 (2.698)	2.322 (1.865)	1.377 (1.612)	1.712 (2.188)	0.958 (1.47)

Table 2.3. Cyclicity of lending: Baseline estimations

The table shows the results of two-step system GMM panel regressions (Arellano and Bover, 1995; Blundell and Bond, 1998) with Windmeijer (2005) correction. The dependent variable is *Credit Growth*, which is the growth rate of net loans in real US dollars. We regress *Credit Growth* on bank ownership and bank-level variables in the period 2002-2015. *Host GDP per Capita Growth* is the annual percentage growth rate of GDP per capita in the African host country. *Pan-African*, *Foreign Developed*, *Foreign Developing* and *Domestic Public* are dummies respectively equal to 1 if the bank is a Pan-Africa bank, a foreign bank from a developed country, a foreign bank from a developing country, or a domestic state-owned bank. The omitted category are domestic privately-owned banks. Each ownership category is interacted with *Host GDP per Capita Growth* in order to capture the different lending cyclicity relative to domestic private banks' lending cyclicity. All the bank-level and macroeconomic control variables are defined in Appendix 2.3. Year and country dummies are incorporated in some specifications. The p-values for robust standard errors are given in parentheses and ***, **, * correspond to the 1%, 5%, and 10% levels of significance, respectively.

	Credit Growth	Credit Growth	Credit Growth	Credit Growth	Credit Growth	Credit Growth	Credit Growth	Credit Growth	Credit Growth	Credit Growth
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lagged Credit Growth	0.173*** (0.000)	0.170*** (0.000)	0.100*** (0.009)	0.107*** (0.006)	0.079** (0.035)	0.085** (0.026)	0.093*** (0.008)	0.095*** (0.007)	0.075** (0.033)	0.079** (0.024)
Host GDP per Capita Growth	3.540*** (0.000)	2.549*** (0.000)	2.630*** (0.001)	2.017*** (0.000)	2.444*** (0.002)	1.851*** (0.000)	2.476*** (0.001)	1.979*** (0.000)	2.322*** (0.001)	1.905*** (0.000)
Pan-African	0.071** (0.016)	0.055*** (0.007)	-0.020 (0.552)	-0.004 (0.853)	-0.022 (0.512)	-0.003 (0.883)	-0.030 (0.319)	0.001 (0.978)	-0.027 (0.378)	0.005 (0.837)
PAB × Host GDP per Capita Growth	-2.454*** (0.004)	-1.444** (0.013)	-1.691** (0.045)	-1.044* (0.052)	-1.461* (0.087)	-0.854 (0.121)	-1.519* (0.059)	-0.978* (0.074)	-1.419* (0.087)	-0.969* (0.088)
Foreign Developed	0.008 (0.819)		-0.060 (0.100)		-0.068* (0.066)		-0.065* (0.073)		-0.076** (0.037)	
Developed × Host GDP per Capita Growth	-1.919* (0.100)		-1.336 (0.237)		-1.198 (0.293)		-0.988 (0.326)		-0.857 (0.407)	
Foreign Developing	0.050 (0.121)		-0.019 (0.645)		-0.018 (0.686)		-0.075* (0.074)		-0.066 (0.104)	
Developing × Host GDP per Capita Growth	-1.822 (0.268)		-1.414 (0.340)		-1.450 (0.337)		-0.391 (0.790)		-0.474 (0.739)	
Domestic Public	0.059* (0.091)		0.072** (0.049)		0.060 (0.119)		0.055 (0.150)		0.045 (0.226)	

Public × Host GDP per Capita Growth	-2.094** (0.040)		-1.540 (0.123)		-1.446 (0.143)		-1.012 (0.296)		-0.980 (0.309)	
Lagged Size			-0.064*** (0.000)	-0.057*** (0.000)	-0.058*** (0.000)	-0.053*** (0.000)	-0.080*** (0.000)	-0.078*** (0.000)	-0.075*** (0.000)	-0.072*** (0.000)
Lagged Bank Soundness			0.165 (0.329)	0.157 (0.374)	0.244 (0.159)	0.230 (0.198)	0.091 (0.624)	-0.046 (0.816)	0.108 (0.522)	0.013 (0.941)
Lagged Liquidity			0.336*** (0.000)	0.329*** (0.000)	0.315*** (0.000)	0.306*** (0.000)	0.394*** (0.000)	0.382*** (0.000)	0.383*** (0.000)	0.363*** (0.000)
GDP per Capita			0.023** (0.016)	0.019** (0.037)	0.024** (0.012)	0.020** (0.027)	0.039 (0.314)	0.033 (0.363)	0.173*** (0.000)	0.172*** (0.000)
Inflation			-0.103 (0.504)	-0.040 (0.791)	-0.121 (0.433)	-0.057 (0.709)	-0.087 (0.691)	-0.101 (0.651)	-0.121 (0.587)	-0.136 (0.542)
Year fixed effects	No	No	No	No	Yes	Yes	No	No	Yes	Yes
Country fixed effects	No	No	No	No	No	No	Yes	Yes	Yes	Yes
Constant	0.045* (0.070)	0.061*** (0.000)	0.727*** (0.000)	0.657*** (0.000)	0.719*** (0.000)	0.661*** (0.000)	0.747*** (0.004)	0.803*** (0.002)	-0.008 (0.979)	-0.021 (0.949)
Number of observations	1675	1675	1668	1668	1668	1668	1668	1668	1668	1668
Number of banks	230	230	230	230	230	230	230	230	230	230
Number of instruments	186	180	191	185	192	186	228	222	229	223
Second order AR tests	0.143	0.120	0.404	0.321	0.545	0.456	0.412	0.370	0.542	0.489
Hansen test	0.204	0.199	0.217	0.235	0.199	0.237	0.319	0.383	0.409	0.428

Table 2.4. Sensitivity to home country business cycle

The table shows the results of two-step system GMM panel regressions (Arellano and Bover, 1995; Blundell and Bond, 1998) with Windmeijer (2005) correction. The database is only made of foreign-owned banks. The dependent variable is *Credit Growth*, which is the growth rate of net loans in real US dollars. We regress *Credit Growth* on bank ownership and bank-level variables in the period 2002-2015. *Home GDP per Capita Growth* is the annual percentage growth rate of GDP per capita in the foreign banks' home country. *Host GDP per Capita Growth* is the annual percentage growth rate of GDP per capita in the African host country. *Foreign Developed* and *Foreign Developing* are dummies respectively equal to 1 if the bank is a foreign bank from a developed country and a foreign bank from a developing country. The omitted category are Pan-African banks. Each ownership category is interacted with *Home GDP per Capita Growth* in order to capture the different lending cyclicality relative to Pan-African banks' lending cyclicality. All the bank-level and macroeconomic control variables are defined in Appendix 2.3. Year and country dummies are incorporated in some specifications. The p-values for robust standard errors are given in parentheses and ***, **, * correspond to the 1%, 5%, and 10% levels of significance, respectively.

	Credit Growth	Credit Growth	Credit Growth	Credit Growth	Credit Growth
	(1)	(2)	(3)	(4)	(5)
Lagged Credit Growth	0.142*** (0.005)	0.062 (0.219)	0.051 (0.292)	0.050 (0.257)	0.033 (0.456)
Home GDP per Capita Growth	0.674 (0.175)	0.731* (0.062)	0.728* (0.063)	0.578 (0.108)	0.548 (0.125)
Host GDP per Capita Growth	1.277*** (0.000)	0.959*** (0.005)	0.946*** (0.006)	1.071*** (0.003)	1.009*** (0.005)
Foreign Developed	-0.046** (0.035)	-0.017 (0.489)	-0.026 (0.257)	-0.059 (0.323)	-0.084 (0.203)
Developed × Home GDP per Capita Growth	-0.179 (0.814)	-0.594 (0.363)	-0.608 (0.348)	-0.164 (0.801)	0.011 (0.986)
Foreign Developing	-0.005 (0.830)	0.028 (0.446)	0.024 (0.535)	-0.101 (0.155)	-0.122* (0.096)
Developing × Home GDP per Capita Growth	-0.740 (0.210)	-1.047 (0.166)	-0.971 (0.205)	-0.653 (0.448)	-0.549 (0.537)
Lagged Size		-0.090*** (0.000)	-0.075*** (0.000)	-0.153*** (0.000)	-0.134*** (0.000)
Lagged Bank Soundness		0.305 (0.280)	0.351 (0.199)	-0.520 (0.311)	-0.439 (0.373)

Lagged Liquidity		0.322***	0.305***	0.512***	0.489***
		(0.000)	(0.000)	(0.000)	(0.000)
GDP per Capita		0.012	0.011	0.148*	0.263***
		(0.350)	(0.398)	(0.073)	(0.002)
Inflation		0.086	0.016	-0.428	-0.518
		(0.668)	(0.935)	(0.235)	(0.158)
Year dummies	No	No	Yes	No	Yes
Country dummies	No	No	No	Yes	Yes
Constant	0.098***	1.119***	0.996***	0.983*	-0.036
	(0.000)	(0.000)	(0.000)	(0.096)	(0.963)
Number of observations	951	949	949	949	949
Number of banks	131	131	131	131	131
Number of instruments	84	89	90	122	123
Second order AR tests	0.175	0.546	0.633	0.502	0.601
Hansen test	0.271	0.120	0.145	0.341	0.414

Table 2.5. Cyclicity of lending: Robustness check with GDP growth

The table shows the results of two-step system GMM panel regressions (Arellano and Bover, 1995; Blundell and Bond, 1998) with Windmeijer (2005) correction. The dependent variable is *Credit Growth*, which is the growth rate of net loans in real US dollars. We regress *Credit Growth* on bank ownership and bank-level variables in the period 2002-2015. *Host GDP Growth* is the annual percentage growth rate of GDP in the African host country. *Pan-African*, *Foreign Developed*, *Foreign Developing* and *Domestic Public* are dummies respectively equal to 1 if the bank is a Pan-Africa bank, a foreign bank from a developed country, a foreign bank from a developing country, or a domestic state-owned bank. The omitted category are domestic privately-owned banks. Each ownership category is interacted with *Host GDP Growth* in order to capture the different lending cyclicity relative to domestic private banks' lending cyclicity. All the bank-level and macroeconomic control variables are defined in Appendix 2.3. Year and country dummies are incorporated in some specifications. The p-values for robust standard errors are given in parentheses and ***, **, * correspond to the 1%, 5%, and 10% levels of significance, respectively.

	Credit Growth	Credit Growth	Credit Growth	Credit Growth	Credit Growth
	(1)	(2)	(3)	(4)	(5)
Lagged Credit Growth	0.146*** (0.000)	0.088** (0.026)	0.067* (0.087)	0.077** (0.034)	0.056 (0.109)
Host GDP Growth	3.413*** (0.000)	2.565*** (0.001)	2.429*** (0.002)	2.423*** (0.000)	2.262*** (0.000)
Pan-African	0.113*** (0.010)	0.007 (0.888)	0.004 (0.941)	-0.002 (0.954)	-0.004 (0.928)
PAB × Host GDP Growth	-2.278*** (0.004)	-1.450* (0.073)	-1.248 (0.125)	-1.397* (0.050)	-1.308* (0.071)
Foreign Developed	0.042 (0.457)	-0.031 (0.614)	-0.038 (0.516)	-0.048 (0.361)	-0.061 (0.244)
Developed × Host GDP Growth	-1.875* (0.071)	-1.303 (0.232)	-1.193 (0.273)	-0.965 (0.313)	-0.787 (0.403)
Foreign Developing	0.020 (0.748)	-0.049 (0.462)	-0.048 (0.473)	-0.122* (0.055)	-0.124* (0.059)
Developing × Host GDP Growth	0.775 (0.679)	0.609 (0.713)	0.693 (0.675)	1.523 (0.346)	1.646 (0.332)
Domestic Public	0.086* (0.063)	0.096* (0.060)	0.086* (0.089)	0.057 (0.225)	0.044 (0.344)
Public × Host GDP Growth	-1.715* (0.059)	-1.334 (0.161)	-1.284 (0.174)	-0.671 (0.452)	-0.602 (0.504)
Lagged Size		-0.063*** (0.000)	-0.056*** (0.000)	-0.077*** (0.000)	-0.077*** (0.000)
Lagged Bank Soundness		0.168 (0.325)	0.267 (0.127)	0.098 (0.583)	0.109 (0.533)
Lagged Liquidity		0.323*** (0.000)	0.298*** (0.000)	0.379*** (0.000)	0.359*** (0.000)
GDP per Capita		0.031*** (0.002)	0.031*** (0.001)	0.037 (0.318)	0.176*** (0.000)
Inflation		-0.088 (0.574)	-0.108 (0.484)	-0.042 (0.847)	-0.088 (0.683)
Year dummies	No	No	Yes	No	Yes
Country dummies	No	No	No	Yes	Yes
Constant	-0.020 (0.611)	0.601*** (0.000)	0.598*** (0.000)	0.714*** (0.006)	-0.044 (0.894)
Number of observations	1675	1668	1668	1668	1668
Number of banks	230	230	230	230	230
Number of instruments	186	191	192	228	229
Second order AR test	0.136	0.360	0.510	0.402	0.549
Hansen test	0.177	0.143	0.141	0.295	0.397

**Table 2.6. Sensitivity to home country business cycle:
Robustness check with GDP growth**

The table shows the results of two-step system GMM panel regressions (Arellano and Bover, 1995; Blundell and Bond, 1998) with Windmeijer (2005) correction. The database is only made of foreign-owned banks. The dependent variable is *Credit Growth*, which is the growth rate of net loans in real US dollars. We regress *Credit Growth* on bank ownership and bank-level variables in the period 2002-2015. *Home GDP Growth* is the annual percentage growth rate of GDP in the foreign banks' home country. *Host GDP Growth* is the annual percentage growth rate of GDP in the African host country. *Foreign Developed* and *Foreign Developing* are dummies respectively equal to 1 if the bank is a foreign bank from a developed country and a foreign bank from a developing country. The omitted category are Pan-African banks. Each ownership category is interacted with *Home GDP Growth* in order to capture the different lending cyclicalities relative to Pan-African banks' lending cyclicalities. All the bank-level and macroeconomic control variables are defined in Appendix 2.3. Year and country dummies are incorporated in some specifications. The p-values for robust standard errors are given in parentheses and ***, **, * correspond to the 1%, 5%, and 10% levels of significance, respectively.

	Credit Growth	Credit Growth	Credit Growth	Credit Growth	Credit Growth
	(1)	(2)	(3)	(4)	(5)
Lagged Credit Growth	0.141*** (0.006)	0.064 (0.199)	0.050 (0.297)	0.052 (0.240)	0.037 (0.402)
Home GDP Growth	0.706 (0.157)	0.674* (0.052)	0.681* (0.051)	0.554* (0.099)	0.532 (0.100)
Host GDP Growth	1.233*** (0.000)	0.938*** (0.005)	0.945*** (0.006)	0.952*** (0.007)	0.863** (0.017)
Foreign Developed	-0.037 (0.164)	-0.010 (0.699)	-0.021 (0.382)	-0.042 (0.431)	-0.047 (0.412)
Developed × Home GDP Growth	-0.011 (0.987)	-0.431 (0.460)	-0.448 (0.439)	0.104 (0.875)	0.293 (0.664)
Foreign Developing	0.020 (0.607)	0.081 (0.199)	0.078 (0.215)	-0.052 (0.553)	-0.055 (0.517)
Developing × Home GDP Growth	-0.765 (0.413)	-1.573 (0.149)	-1.618 (0.134)	-1.136 (0.333)	-1.166 (0.301)
Lagged Size		-0.090*** (0.000)	-0.073*** (0.000)	-0.149*** (0.000)	-0.129*** (0.000)
Lagged Bank Soundness		0.302 (0.280)	0.346 (0.193)	-0.450 (0.338)	-0.355 (0.408)
Lagged Liquidity		0.321*** (0.000)	0.302*** (0.000)	0.489*** (0.000)	0.462*** (0.000)
GDP per Capita		0.020 (0.131)	0.019 (0.144)	0.125 (0.113)	0.249*** (0.002)
Inflation		0.069 (0.726)	-0.016 (0.934)	-0.498 (0.192)	-0.530 (0.182)
Year dummies	No	No	Yes	No	Yes
Country dummies	No	No	No	Yes	Yes
Constant	0.056** (0.040)	1.024*** (0.000)	0.886*** (0.000)	1.217** (0.035)	0.145 (0.820)
Number of observations	963	961	961	961	961
Number of banks	132	132	132	132	132
Number of instruments	84	89	90	122	123
Second order AR tests	0.153	0.501	0.606	0.477	0.564
Hansen test	0.249	0.113	0.143	0.292	0.412

**Table 2.7. Cyclicity of lending:
Robustness check with additional bank-level control variables**

The table shows the results of two-step system GMM panel regressions (Arellano and Bover, 1995; Blundell and Bond, 1998) with Windmeijer (2005) correction. The dependent variable is *Credit Growth*, which is the growth rate of net loans in real US dollars. We regress *Credit Growth* on bank ownership and bank-level variables in the period 2002-2015. *Host GDP per capita Growth* is the annual percentage growth rate of GDP per capita in the African host country. *Pan-African*, *Foreign Developed*, *Foreign Developing* and *Domestic Public* are dummies respectively equal to 1 if the bank is a Pan-Africa bank, a foreign bank from a developed country, a foreign bank from a developing country, or a domestic state-owned bank. The omitted category are domestic privately-owned banks. Each ownership category is interacted with *Host GDP per Capita Growth* in order to capture the different lending cyclicity relative to domestic private banks' lending cyclicity. All the bank-level and macroeconomic control variables are defined in Appendix 2.3. Year and country dummies are incorporated in some specifications. The p-values for robust standard errors are given in parentheses and ***, **, * correspond to the 1%, 5%, and 10% levels of significance, respectively.

	Credit Growth	Credit Growth	Credit Growth	Credit Growth
	(1)	(2)	(3)	(4)
Lagged Credit Growth	0.107*** (0.007)	0.076* (0.052)	0.095*** (0.010)	0.079* (0.072)
Host GDP per Capita Growth	2.530*** (0.002)	2.221*** (0.007)	2.554*** (0.000)	2.346*** (0.002)
Pan-African	-0.033 (0.342)	-0.038 (0.278)	-0.033 (0.266)	-0.029 (0.354)
PAB × Host GDP per Capita Growth	-1.688** (0.043)	-1.347 (0.115)	-1.614** (0.037)	-1.468* (0.067)
Foreign Developed	-0.063 (0.103)	-0.072* (0.055)	-0.062* (0.091)	-0.069* (0.069)
Developed × Host GDP per Capita Growth	-1.347 (0.246)	-1.145 (0.317)	-1.184 (0.235)	-1.093 (0.295)
Foreign Developing	-0.040 (0.366)	-0.039 (0.396)	-0.073 (0.149)	-0.072 (0.170)
Developing × Host GDP per Capita Growth	-1.314 (0.391)	-1.349 (0.366)	-0.742 (0.640)	-0.776 (0.617)
Domestic Public	0.073* (0.063)	0.057 (0.129)	0.068 (0.116)	0.046 (0.301)
Public × Host GDP per Capita Growth	-1.417 (0.169)	-1.262 (0.218)	-1.099 (0.257)	-0.981 (0.329)
Lagged Size	-0.072*** (0.000)	-0.065*** (0.000)	-0.091*** (0.000)	-0.083*** (0.000)
Lagged Bank Soundness	0.197 (0.299)	0.272 (0.149)	0.042 (0.869)	0.083 (0.728)
Lagged Liquidity	0.229*** (0.000)	0.198*** (0.000)	0.264*** (0.000)	0.257*** (0.000)
Lagged Loans to OEA	-0.031*** (0.000)	-0.033*** (0.000)	-0.037*** (0.000)	-0.035*** (0.000)
Lagged Deposits Growth	-0.017 (0.139)	-0.014 (0.153)	-0.022* (0.064)	-0.019 (0.103)
Lagged ROAA	0.189 (0.639)	0.274 (0.502)	0.573 (0.180)	0.423 (0.351)
GDP per Capita	0.035*** (0.000)	0.034*** (0.000)	0.041 (0.308)	0.170*** (0.000)
Inflation	-0.233 (0.132)	-0.268* (0.086)	-0.127 (0.578)	-0.150 (0.522)
Year dummies	No	Yes	No	Yes
Country dummies	No	No	Yes	Yes
Constant	0.860*** (0.000)	0.867*** (0.000)	1.094*** (0.000)	0.314 (0.354)
Number of observations	1667	1667	1667	1667
Number of banks	230	230	230	230
Number of instruments	194	195	231	232
Second order AR tests	0.455	0.687	0.531	0.668
Hansen test	0.221	0.242	0.281	0.304

**Table 2.8. Sensitivity to home country business cycle:
Robustness check with additional bank-level control variables**

The table shows the results of two-step system GMM panel regressions (Arellano and Bover, 1995; Blundell and Bond, 1998) with Windmeijer (2005) correction. The database is only made of foreign-owned banks. The dependent variable is *Credit growth*, which is the growth rate of net loans in real US dollars. We regress *Credit growth* on bank ownership and bank-level variables in the period 2002-2015. *Home GDP per Capita Growth* is the annual percentage growth rate of GDP per capita in the foreign banks' home country. *Host GDP per Capita Growth* is the annual percentage growth rate of GDP per capita in the African host country. *Foreign Developed* and *Foreign Developing* are dummies respectively equal to 1 if the bank is a foreign bank from a developed country and a foreign bank from a developing country. The omitted category are Pan-African banks. Each ownership category is interacted with *Home GDP per Capita Growth* in order to capture the different lending cyclicality relative to Pan-African banks' lending cyclicality. All the bank-level and macroeconomic control variables are defined in Appendix 2.3. Year and country dummies are incorporated in some specifications. The p-values for robust standard errors are given in parentheses and ***, **, * correspond to the 1%, 5%, and 10% levels of significance, respectively.

	Credit Growth	Credit Growth	Credit Growth	Credit Growth
	(1)	(2)	(3)	(4)
Lagged Credit Growth	0.078 (0.128)	0.064 (0.199)	0.070 (0.119)	0.053 (0.257)
Home GDP per Capita Growth	0.723* (0.058)	0.725* (0.057)	0.661* (0.074)	0.660* (0.082)
Host GDP per Capita Growth	1.000*** (0.002)	0.985*** (0.003)	1.011*** (0.007)	0.919** (0.018)
Foreign Developed	-0.019 (0.432)	-0.031 (0.179)	-0.017 (0.768)	-0.029 (0.611)
Developed × Home GDP per Capita Growth	-0.703 (0.314)	-0.739 (0.279)	-0.204 (0.775)	-0.122 (0.872)
Foreign Developing	0.023 (0.533)	0.016 (0.666)	-0.063 (0.395)	-0.066 (0.342)
Developing × Home GDP per Capita Growth	-1.061 (0.172)	-0.957 (0.230)	-0.810 (0.375)	-0.905 (0.323)
Lagged Size	-0.088*** (0.000)	-0.070*** (0.000)	-0.144*** (0.000)	-0.129*** (0.000)
Lagged Bank Soundness	0.379 (0.245)	0.419 (0.180)	-0.389 (0.511)	-0.290 (0.618)
Lagged Liquidity	0.327*** (0.000)	0.305*** (0.000)	0.498*** (0.000)	0.437*** (0.001)
Lagged Loans to OEA	-0.000*** (0.000)	-0.000*** (0.004)	-0.000*** (0.000)	-0.000*** (0.000)
Lagged Deposits Growth	-0.008 (0.617)	-0.006 (0.744)	-0.017 (0.439)	-0.017 (0.415)
Lagged ROAA	-0.211 (0.675)	-0.195 (0.695)	0.340 (0.600)	0.290 (0.642)
GDP per Capita	0.010 (0.451)	0.008 (0.520)	0.142* (0.084)	0.258*** (0.002)
Inflation	0.122 (0.556)	0.044 (0.830)	-0.413 (0.275)	-0.501 (0.197)
Year dummies	No	Yes	No	Yes
Country dummies	No	No	Yes	Yes
Constant	1.096*** (0.000)	0.943*** (0.000)	1.236** (0.014)	-0.123 (0.852)
Number of observations	948	948	948	948
Number of banks	131	131	131	131
Number of instruments	92	93	125	126
Second order AR tests	0.451	0.547	0.399	0.509
Hansen test	0.139	0.195	0.380	0.415

Table 2.9. Cyclicity of lending: The impact of the global financial crisis

The table shows the results of two-step system GMM panel regressions (Arellano and Bover, 1995; Blundell and Bond, 1998) with Windmeijer (2005) correction. The dependent variable is *Credit Growth*, which is the growth rate of net loans in real US dollars. We regress *Credit Growth* on bank ownership and bank-level variables in the period 2002-2015. *Host GDP per Capita Growth* is the annual percentage growth rate of GDP in the African host country. *Pan-African*, *Foreign Developed*, *Foreign Developing* and *Domestic Public* are dummies respectively equal to 1 if the bank is a Pan-Africa bank, a foreign bank from a developed country, a foreign bank from a developing country, or a domestic state-owned bank. The omitted category are domestic privately-owned banks. Each ownership category is interacted with *Host GDP per Capita Growth* in order to capture the different lending cyclicity relative to domestic private banks' lending cyclicity. Following Allen, Jackowicz, Kowalewski and Kozlowski (2017), *Global Crisis* is a dummy equal to 1 for the years 2008-2010. *Global Crisis* is interacted with each ownership category in order to capture the different responses of banks to the global financial crisis relative to domestic private banks. All the bank-level and macroeconomic control variables are defined in Appendix 2.3. Country dummies are incorporated in some specifications. The p-values for robust standard errors are given in parentheses and ***, **, * correspond to the 1%, 5%, and 10% levels of significance, respectively.

	Credit Growth	Credit Growth	Credit Growth	Credit Growth	Credit Growth
	(1)	(2)	(3)	(4)	(5)
Lagged Credit Growth	0.174*** (0.000)	0.100*** (0.010)	0.078** (0.039)	0.093*** (0.009)	0.070* (0.064)
Host GDP per Capita Growth	3.592*** (0.000)	2.645*** (0.001)	2.384*** (0.004)	2.482*** (0.000)	2.204*** (0.002)
Global Crisis	0.026 (0.380)	0.010 (0.730)	-0.005 (0.858)	0.009 (0.732)	-0.016 (0.536)
Pan-African	0.087*** (0.004)	-0.009 (0.791)	-0.012 (0.720)	-0.019 (0.571)	-0.018 (0.588)
PAB × Host GDP per Capita Growth	-2.581*** (0.002)	-1.743** (0.037)	-1.459* (0.090)	-1.574** (0.047)	-1.495* (0.066)
PAB × Global Crisis	-0.045 (0.275)	-0.034 (0.368)	-0.031 (0.405)	-0.035 (0.321)	-0.033 (0.370)
Foreign Developed	0.032 (0.391)	-0.039 (0.278)	-0.047 (0.194)	-0.045 (0.239)	-0.056 (0.138)
Developed × Host GDP per Capita Growth	-2.106* (0.058)	-1.380 (0.223)	-1.221 (0.288)	-1.047 (0.309)	-0.922 (0.392)
Developed × Global Crisis	-0.079** (0.048)	-0.068* (0.067)	-0.068* (0.067)	-0.074** (0.046)	-0.072** (0.042)

Foreign Developing	0.053 (0.123)	-0.019 (0.690)	-0.021 (0.683)	-0.079* (0.081)	-0.076* (0.089)
Developing × Host GDP per Capita Growth	-1.853 (0.276)	-1.366 (0.348)	-1.405 (0.364)	-0.290 (0.847)	-0.591 (0.653)
Developing × Global Crisis	0.026 (0.527)	0.007 (0.882)	0.011 (0.829)	0.028 (0.584)	0.043 (0.448)
Domestic Public	0.047 (0.165)	0.065* (0.093)	0.046 (0.245)	0.041 (0.328)	0.022 (0.605)
Public × Host GDP per Capita Growth	-2.050** (0.038)	-1.506 (0.129)	-1.374 (0.164)	-0.983 (0.316)	-0.992 (0.314)
Public × Global Crisis	0.038 (0.443)	0.026 (0.549)	0.033 (0.443)	0.034 (0.409)	0.041 (0.324)
Lagged Size		-0.063*** (0.000)	-0.057*** (0.000)	-0.079*** (0.000)	-0.077*** (0.000)
Lagged Bank Soundness		0.151 (0.376)	0.233 (0.191)	0.046 (0.805)	0.037 (0.853)
Lagged Liquidity		0.342*** (0.000)	0.322*** (0.000)	0.402*** (0.000)	0.370*** (0.000)
GDP per Capita		0.023** (0.014)	0.024** (0.011)	0.042 (0.268)	0.193*** (0.000)
Inflation		-0.101 (0.507)	-0.105 (0.490)	-0.054 (0.805)	-0.044 (0.841)
Year fixed effects	No	No	Yes	No	Yes
Country fixed effects	No	No	No	Yes	Yes
Constant	0.036 (0.155)	0.718*** (0.000)	0.720*** (0.000)	0.743*** (0.003)	-0.063 (0.840)
Number of observations	1675	1668	1668	1668	1668
Number of banks	230	230	230	230	230
Number of instruments	191	196	197	233	234
Second order AR tests	0.156	0.395	0.520	0.412	0.573
Hansen test	0.214	0.246	0.186	0.190	0.215

Table 2.10. Sensitivity to home country business cycle: The impact of the global financial crisis

The table shows the results of two-step system GMM panel regressions (Arellano and Bover, 1995; Blundell and Bond, 1998) with Windmeijer (2005) correction. The database is only made of foreign-owned banks. The dependent variable is *Credit Growth*, which is the growth rate of net loans in real US dollars. We regress *Credit Growth* on bank ownership and bank-level variables in the period 2002-2015. *Home GDP per Capita Growth* is the annual percentage growth rate of GDP per capita in the foreign banks' home country. *Host GDP per Capita Growth* is the annual percentage growth rate of GDP per capita in the African host country. *Foreign Developed* and *Foreign Developing* are dummies respectively equal to 1 if the bank is a foreign bank from a developed country and a foreign bank from a developing country. The omitted category are Pan-African banks. Each ownership category is interacted with *Home GDP per Capita Growth* in order to capture the different lending cyclicalities relative to Pan-African banks' lending cyclicalities. Following Allen, Jackowicz, Kowalewski and Kozlowski (2017), *Global Crisis* is a dummy equal to 1 for the years 2008-2010. *Global Crisis* is interacted with each ownership category in order to capture the different responses of banks to the global financial crisis relative to domestic private banks. All the bank-level and macroeconomic control variables are defined in Appendix 2.3. Country dummies are incorporated in some specifications. The p-values for robust standard errors are given in parentheses and ***, **, * correspond to the 1%, 5%, and 10% levels of significance, respectively.

	Credit Growth	Credit Growth	Credit Growth	Credit Growth	Credit Growth
	(1)	(2)	(3)	(4)	(5)
Lagged Credit Growth	0.151*** (0.004)	0.077 (0.128)	0.065 (0.184)	0.068 (0.131)	0.051 (0.258)
Home GDP per Capita Growth	0.718 (0.155)	0.795* (0.055)	0.806* (0.056)	0.625 (0.102)	0.610 (0.129)
Host GDP per Capita Growth	1.195*** (0.001)	0.837** (0.019)	0.785** (0.029)	0.859** (0.026)	0.716* (0.065)
Global Crisis	-0.019 (0.516)	-0.035 (0.201)	-0.044 (0.118)	-0.037 (0.180)	-0.060** (0.039)
Foreign Developed	-0.033 (0.238)	-0.007 (0.778)	-0.015 (0.529)	-0.028 (0.680)	-0.072 (0.313)
Developed × Home GDP per Capita Growth	-0.617 (0.458)	-1.062 (0.124)	-1.160* (0.092)	-0.446 (0.544)	-0.358 (0.625)
Developed × Global Crisis	-0.032 (0.431)	-0.023 (0.559)	-0.027 (0.484)	-0.019 (0.644)	-0.016 (0.688)
Foreign Developing	-0.025 (0.283)	0.017 (0.674)	0.009 (0.821)	-0.100 (0.184)	-0.121 (0.114)

Developing × Home GDP per Capita Growth	-0.650 (0.306)	-0.971 (0.211)	-0.915 (0.250)	-0.467 (0.652)	-0.396 (0.701)
Developing × Global Crisis	0.102*** (0.005)	0.062 (0.259)	0.062 (0.259)	0.101 (0.178)	0.100 (0.151)
Lagged Size		-0.086*** (0.000)	-0.071*** (0.001)	-0.148*** (0.000)	-0.118*** (0.000)
Lagged Bank Soundness		0.227 (0.416)	0.279 (0.305)	-0.641 (0.226)	-0.642 (0.208)
Lagged Liquidity		0.316*** (0.000)	0.309*** (0.000)	0.508*** (0.000)	0.485*** (0.000)
GDP per Capita		0.013 (0.353)	0.012 (0.356)	0.155* (0.078)	0.301*** (0.000)
Inflation		0.076 (0.728)	0.007 (0.974)	-0.343 (0.359)	-0.516 (0.183)
Year dummies	No	No	Yes	No	Yes
Country dummies	No	No	No	Yes	Yes
Constant	0.101*** (0.000)	1.076*** (0.000)	0.960*** (0.000)	1.346*** (0.008)	-0.122 (0.857)
Number of observations	951	949	949	949	949
Number of banks	131	131	131	131	131
Number of instruments	87	92	93	125	126
Second order AR tests	0.187	0.479	0.560	0.438	0.530
Hansen test	0.200	0.124	0.135	0.273	0.387

Appendix

Appendix 2.1. Banks in our sample

Host Country	Total number of banks	Banks by ownership				
		Foreign			Domestic	
		Pan-African	Developed	Developing	Private	Public
Algeria	13	0	3	4	1	5
Angola	11	1	4	0	4	2
Benin	4	4	0	0	0	0
Botswana	5	3	1	0	1	0
Burkina Faso	5	4	0	0	2	0
Cameroon	6	3	3	0	1	0
Cape Verde	2	0	1	0	1	0
Congo	3	3	1	0	0	0
Côte d'Ivoire	6	4	3	0	0	0
Democratic Republic of Congo	4	0	2	0	2	1
Djibouti	2	1	2	0	0	0
Egypt	24	1	4	9	4	6
Equatorial Guinea	1	0	1	0	0	0
Eritrea	1	0	0	0	0	1
Ethiopia	6	0	0	0	5	1
Gabon	2	1	0	0	1	0
Ghana	10	5	2	0	2	1
Kenya	16	4	2	1	9	1
Lesotho	1	1	0	0	0	0
Madagascar	2	1	1	0	0	0
Mali	5	4	1	0	2	0
Mauritius	12	4	3	2	5	0
Morocco	9	0	2	0	6	1
Mozambique	5	2	2	0	1	0
Namibia	4	3	0	0	1	0
Niger	1	1	0	0	0	0
Nigeria	16	2	2	0	13	0
Rwanda	1	0	0	0	0	1
Senegal	8	4	2	0	2	1
Seychelles	1	1	0	0	0	0
South Africa	8	0	1	0	7	0
Sudan	3	0	0	1	1	1
Togo	2	0	0	0	2	0
Tunisia	13	2	3	2	5	3
Uganda	4	2	1	0	1	0
United Republic of Tanzania	7	2	2	0	3	0
Zambia	5	3	2	0	0	1
Zimbabwe	2	1	0	0	1	0
Total	230	67	51	19	83	26

Appendix 2.2. Foreign banks' parent in our sample

Parent Bank	Home Country	Host Countries (Africa)
<i>Pan African</i>		
Access Bank	Nigeria	Ghana
Attijari Bank	Morocco	Cameroon, Congo, Côte d'Ivoire, Gabon, Mali, Senegal, Tunisia
Bank of Africa // Banque Marocaine du Commerce Extérieur (BMCE) after 2010	Mali // Morocco after 2010	Benin, Burkina Faso, Côte d'Ivoire, Djibouti, Kenya, Madagascar, Mali, Senegal
Banque Atlantique // Groupe Banque Centrale Populaire after 2012	Togo // Morocco after 2012	Benin, Burkina Faso, Côte d'Ivoire, Mali, Senegal
Barclays Africa Group	South Africa	Botswana, Egypt, Ghana, Kenya, Mauritius, Mozambique, Seychelles, Tanzania, Uganda, Zambia
BGFI Group	Gabon	Congo
Diamond Bank	Nigeria	Benin
Ecobank	Togo	Benin, Burkina Faso, Cameroon, Congo, Côte d'Ivoire, Kenya, Mali, Niger, Nigeria, Senegal
Firststrand Limited	South Africa	Botswana, Namibia, Zambia
I&M Holdings Limited	Kenya	Mauritius
Investec Bank Limited	South Africa	Mauritius
Libyan Foreign Bank	Libya	Tunisia
Nedbank	South Africa	Namibia
Standard Bank	South Africa	Angola, Botswana, Ghana, Kenya, Lesotho, Mauritius, Mozambique, Namibia, Nigeria, Tanzania, Uganda, Zambia, Zimbabwe
United Bank for Africa (UBA)	Nigeria	Burkina, Cameroon, Ghana
Zenith Bank	Nigeria	Ghana
<i>Foreign Developed</i>		
Banco Comercial Português	Portugal	Mozambique
Banco Espírito Santo	Portugal	Angola
Banco BPI	Portugal	Angola
BPCE	France	Algeria, Cameroon, Djibouti, Mauritius
BNP Paribas	France	Algeria, Côte d'Ivoire, Senegal, Tunisia
Caixa Económica Montepio Geral	Portugal	Angola
Caixa Geral de Depósitos (CGD)	Portugal	Cape Verde, Mozambique, South Africa
Crédit Agricole	France	Cameroon, Congo, Côte d'Ivoire, Egypt
HSBC	United Kingdom	Egypt, Mauritius
Intesa Sanpaolo	Italy	Egypt
Piraeus Bank	Greece	Egypt
Rabobank	Netherlands	Tanzania, Zambia
Société Générale	France	Algeria, Cameroon, Côte d'Ivoire, Equatorial Guinea, Ghana, Madagascar, Morocco, Senegal, Tunisia
Standard Chartered	United Kingdom	Botswana, Ghana, Kenya, Mauritius, Nigeria, Tanzania, Uganda, Zambia

Citibank	United States	Kenya, Morocco, Nigeria
<i>Foreign Developing</i>		
Abu Dhabi Islamic Bank	United Arab Emirates	Egypt
Ahli United Bank	Bahrain	Egypt
Al Baraka Bank	Bahrain	Algeria, Egypt, Tunisia
Arab Bank Plc	Jordan	Tunisia
Bank ABC (Arab Banking Corporation)	Bahrain	Algeria, Egypt
Bank Audi	Lebanon	Egypt
Bank of Baroda	India	Kenya
BLOM Bank	Lebanon	Egypt
Bumiputra Commerce Bank (now CIMB bank)	Malaysia	Mauritius
Burgan Bank	Kuwait	Algeria
Dubai Islamic Bank	United Arab Emirates	Sudan
The Housing Bank for Trade and Finance (HBTF)	Jordan	Algeria
National Bank of Dubai	United Arab Emirates	Egypt
National Bank of Kuwait (SAK)	Kuwait	Egypt
State Bank of India (SBI)	India	Mauritius
Union National Bank	United Arab Emirates	Egypt

Appendix 2.3. Description of the variables

Variable	Definition	Source
Credit Growth (%)	% Annual change in total net loans (in dollars)	Authors' calculations based on Bankscope
Lagged Size	Lagged log of total assets	Authors' calculations based on Bankscope
Lagged Bank Soundness (%)	Lagged ratio of equity to total assets (%)	Authors' calculations based on Bankscope
Lagged Liquidity (%)	Lagged ratio of liquid to total assets (%)	Authors' calculations based on Bankscope
Lagged Deposits Growth (%)	Lagged annual change in deposits (in dollars) (%)	Authors' calculations based on Bankscope
Lagged Loans to Other Earning Assets (%)	Lagged ratio of loans to other earning assets (%)	Authors' calculations based on Bankscope
Lagged ROAA (%)	Lagged Return on Average Assets (%)	Authors' calculations based on Bankscope
Domestic Public	Dummy equal to 1 if government-owned	Bankscope, banks and central banks' websites
Domestic Private	Dummy equal to 1 if domestic privately-owned	Bankscope, banks and central banks' websites
Foreign Developed	Dummy equal to 1 if owned by a foreign developed bank	Bankscope, banks and central banks' websites
Foreign Developing	Dummy equal to 1 if owned by a foreign developing bank	Bankscope, banks and central banks' websites
Pan-African	Dummy equal to 1 if Pan-African	Bankscope, banks and central banks' websites
Host GDP Growth (%)	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2010 U.S. dollars.	WDI
Host GDP per Capita Growth (%)	Annual percentage growth rate of GDP per capita based on constant local currency. Aggregates are based on constant 2010 U.S. dollars.	WDI
Host GDP per Capita	GDP per capita in constant 2010 U.S. dollars.	WDI
Host Inflation (%)	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly.	WDI
Home GDP Growth (%)	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2010 U.S. dollars.	WDI
Home GDP per Capita Growth (%)	Annual percentage growth rate of GDP per capita based on constant local currency. Aggregates are based on constant 2010 U.S. dollars.	WDI
Global Crisis	Dummy equal to 1 for the years 2008-2010	Authors' calculations

Appendix 2.4. Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Credit Growth (1)	1.000													
Lagged Credit Growth (2)	0.339	1.000												
Host GDP per Capita Growth (3)	0.191	0.171	1.000											
Host GDP Growth (4)	0.235	0.213	0.943	1.000										
Home GDP per Capita Growth (5)	0.160	0.098	0.537	0.502	1.000									
Home GDP Growth (6)	0.196	0.141	0.493	0.514	0.943	1.000								
Lagged Size (7)	-0.337	-0.296	-0.136	-0.217	-0.085	-0.135	1.000							
Lagged Bank Soundness (8)	0.048	-0.010	0.046	0.046	-0.012	-0.026	-0.090	1.000						
Lagged Liquidity (9)	0.240	0.144	0.114	0.149	0.021	0.056	-0.244	-0.064	1.000					
Lagged Loans to OEA (10)	-0.196	-0.030	-0.090	-0.156	-0.048	-0.056	0.078	0.055	-0.387	1.000				
Lagged Deposits Growth (11)	0.175	0.372	0.072	0.085	-0.012	0.030	-0.158	0.067	0.069	0.034	1.000			
Lagged ROAA (12)	-0.009	0.057	0.020	0.042	-0.057	-0.087	0.046	0.303	0.015	-0.060	-0.017	1.000		
Host GDP per Capita (13)	-0.163	-0.158	-0.132	-0.285	-0.149	-0.213	0.515	0.094	-0.162	0.182	-0.033	-0.064	1.000	
Host Inflation (14)	0.070	0.052	0.222	0.225	0.152	0.147	-0.036	0.147	0.127	-0.181	0.006	0.165	-0.157	1.000

Chapter 3²⁰

The Determinants of Financial Inclusion in Africa

Abstract

The objective of this paper is to examine the determinants of financial inclusion in Africa. We use data from the World Bank's Global Findex database on 37 African countries to perform probit estimations and to assess the relation between individual characteristics and financial inclusion indicators. We find that being a man, richer, more educated and older favor financial inclusion with a higher influence of education and income. Mobile banking is driven by the same determinants than traditional banking. We observe that the determinants of informal finance differ from those of formal finance. While all motivations for saving have the same determinants, loan-taking motivations strongly differ with income and education. Our work therefore contains findings to design policies to foster financial inclusion in African countries.

JEL Codes: G21, O16

Keywords: Financial Inclusion, Financial Institutions, Africa.

²⁰ This chapter refers to the article published in Review of Development Finance (2016) with Laurent Weill.

3.1. Introduction

At the G20 Summit in Seoul in 2010, financial inclusion, i.e. the use of formal financial services, has been recognized as one of the main pillars of the global development agenda.

In its most basic definition, financial inclusion refers to the fact that a person owns an account at a formal financial institution. Such an account allows to save and borrow money formally, to contract insurance or to use payment services. Being financially included leads therefore to economic benefits. It can favour disadvantaged and poor people allowing them to increase their income and the probability of being employed (Bruhn and Love, 2014). Indeed, in the absence of inclusive financial systems, poverty traps can emerge and hamper economic development since access to financial tools allows people to invest in their education, finance projects and become entrepreneurs (Demirgüç-Kunt and Klapper, 2012b). In addition, financial inclusion can favour women empowerment (Swamy, 2014) and contribute to financial stability (Han and Melecky, 2013).

Financial inclusion is a particular concern in Africa. Beck and Cull (2015) observe that African banking systems are less inclusive than those outside Africa. Once they drop upper middle-income countries, they observe that 21 percent of firms affirm they have a line of credit and 16.5 percent of households report having an account with a formal financial institution in the median African country, while the figures are respectively 43 percent and 21 percent in the median non-African country. Mlachila et al. (2013a) point out that financial sector development has contributed to improve the growth process but financial services are clustered around major urban areas. There are, however, current evolutions which can foster or at least transform the situation of financial inclusion in Africa with the emergence of mobile banking and the rising economic growth in many of these countries.

Therefore, to understand what influences financial inclusion is a major question to favour economic development in Africa. The objective of this paper is to contribute to the understanding of the determinants of financial inclusion in Africa. In this aim, we use data from the 2014 World Bank's Global Findex database to answer four key questions for financial inclusion in Africa. We realize probit estimations to assess the impact of individual characteristics – gender, age, income and education – on financial inclusion indicators. Our sample covers 37 African countries representing 37,102 individuals.

First, we examine the individual determinants of the three main financial inclusion indicators: ownership of a bank account, saving on a bank account, and use of bank credit. We are then able to identify if some individuals are particularly affected by lack of access to the formal banking industry. Second, we analyse how barriers to financial inclusion are associated with individual characteristics. It helps identifying policies to promote financial inclusion. Third, we investigate the determinants of informal saving and informal credit. It is of importance to check if these alternative forms of finance are associated with different individual characteristics. It is notably of interest to know if gender types differ in the form of finance they mainly use, following the finding from Demirgüç-Kunt, Klapper and Singer (2013) of a gender gap in the use of informal financial services in some countries. Fourth, we study the motivations for saving and credit and check how they are related to individual characteristics. We can then provide a better knowledge of the financial behaviour of individuals in Africa.

Our paper provides several contributions to the literature. First, it contributes to the expanding literature on the determinants of financial inclusion by focusing on Africa in addition to former works worldwide (e.g., Allen et al., 2012, Demirgüç-Kunt and Klapper, 2012b) or analyzing one country (e.g., Fungáčová and Weill, 2015, for China). Demirgüç-Kunt and Klapper (2012) provide an investigation of financial inclusion in Africa, but they only provide statistics on this issue and do not aim to identify the determinants of financial inclusion. Second, our analysis contributes to the literature on key current finance issues for African countries: informal finance, and mobile phone banking. African financial markets are dualistic markets organized around the interaction between formal financial institutions and informal agents. According to Steel et al. (1997), increasing the role of informal institutions can enhance access of the broader population to financial tools but this requires a good understanding of the phenomenon. We provide new analysis of the determinants of informal finance in Africa. We also give new evidence on the determinants of mobile money banking. Such analysis is of prime interest, considering for instance the success of the Kenyan mobile phone-based payments system M-PESA and the potential of mobile banking among the continent (Mlachila, Park and Yabara, 2013).

The paper is organized as follows. Section 2 is dedicated to the related literature. Section 3 provides descriptive statistics on our sample. Section 4 presents the main estimations. Section 5 provides additional estimations to dig deeper what shapes financial inclusion. Section 6 concludes.

3.2. Related literature

In this section we provide an overview of the literature on financial inclusion. We present the main findings for our questions related to levels of financial inclusion, determinants of financial inclusion, and informal financial inclusion.

3.2.1. Levels of financial inclusion

Demirgüç-Kunt et al. (2015) give global statistics about financial inclusion with 2014 data from the Global Findex database. First, 62 percent of adults globally own an account at a formal financial institution, either at a bank or with a mobile money provider. Account ownership has been substantially increasing in the developing world, reaching 54 percent of the population in 2014, notably thanks to innovations like mobile banking. However, the share of the population with a formal account is still far lower than in high-income economies (94 percent). Second, 56 percent of adults worldwide declared having saved money aside in the past 12 months in 2014. One quarter of adults reported having saved money at a formal financial institution, representing half of the savers. However, the percentage of formal saving varies greatly between high-income economies (70 percent among savers) and developing economies (40 percent among savers). Finally, 42 percent of adults worldwide declared having borrowed money in the past 12 months. Formal credit at a financial institution has only been used by 9 percent of adults in developing countries while it has been used by 18 percent in high-income economies.

Financial inclusion varies greatly on the African continent between regions and also between countries (Demirgüç-Kunt and Klapper, 2012a). For example, while 51 percent of Southern Africans owned an account in 2011, only 11 percent of Central Africans did. Concerning formal saving, only 4 percent of North Africans saved money at a formal financial institution while 18 percent of Western Africans did.

Africa is at the leading position in terms of mobile banking with all 13 countries with the highest share of the population owning a mobile money account – 10 percent or more – being African (Demirgüç-Kunt et al., 2015). In a few African countries (Côte d'Ivoire, Somalia, Tanzania, Uganda, and Zimbabwe), more people declared owning a mobile money account than

a formal account at a financial institution. The phenomenon is especially important in Eastern Africa, but also in Southern Africa.

3.2.2. The determinants of financial inclusion

A few studies have examined the individual determinants of financial inclusion.

Using the 2012 World Bank Global Findex Database, Allen et al. (2016) analyze these individual characteristics on a global scale. They find that the probability of owning an account at a formal financial institution is higher for richer, more educated, older, urban, employed, married or separated individuals. The likelihood of saving formally is higher for the same individual characteristics. Finally, the probability of borrowing formally increases for older, educated, richer and married men.

Using the 2012 Global Findex, Fungáčová and Weill (2015) study financial inclusion in China and find that richer, more educated, older men are more likely to be financially included. Concerning barriers to financial inclusion, poorer people care more about their lack of money and the fact that another member of the family has an account while more educated people are more concerned about cost and trust in the banking system. Women are less likely to be financially included because of a lack of documentation or because another member of the family has an account. Finally, older people are more concerned about lack of money, distance and religious reasons. They also find that income and education influence the choice between formal and informal credit but education does not lead to higher formal credit in China. Women seem to be discriminated as they do not substitute formal credit with informal credit.

Kostov, Arun and Annim (2015) study the “Mzansi” accounts in South Africa to analyze the role of households’ behavior decision process. They find that aspirations and financial literacy are important determinants of the decision process.

Gender also matters for financial inclusion. Using the 2012 Global Findex on 98 developing countries, Demirgüç-Kunt, Klapper and Singer (2013) find that a significant gender gap exists in account ownership, formal saving and formal credit. Being a woman would increase the likelihood of being financially excluded. Higher difficulties to present collateral or personal guarantees, lower financial literacy and business experience, the husband’ adverse credit history and constraints felt in the financial system are some of the main reasons for such

gender gap in formal financial inclusion. However, the existence of such discriminations in informal finance is less certain. Indeed, in some countries, women are more likely to use informal financial services. Aterido, Beck and Iacovone (2013) analyze this issue in nine African countries but do not find significant gender discrimination. The gender gap in Africa seems therefore to be linked with women participation outside the financial sector; women would be discriminated in other areas of the economy, like formal employment, education and within the household. Moreover, they confirm that African women are more likely to resort to informal financial services.

Allen et al. (2016) provide evidence of country characteristics influencing financial inclusion. High-quality institutions, efficient legal rules, strong contract enforcement and political stability bring about more financial inclusion. Moreover, characteristics about the banking sector also play a key role. High costs of opening and using bank accounts but also high distance and high disclosure requirements reduce formal inclusion. Trust in the banking sector can also influence. The existence of a deposit insurance scheme and of tax incentive schemes also lead to greater financial inclusion. Religion may influence financial inclusion, as shown by Demirgüç-Kunt, Klapper and Randall (2013). Using a sample of 65,000 adults from 64 economies, they study this question by analyzing the impact of being a Muslim on formal account, formal saving, formal credit, and barriers to financial inclusion. They find that Muslims resort significantly less to formal account ownership and formal saving than non-Muslims. However, Muslims would not be less likely to borrow, either formally or informally, than non-Muslims. The typical categories excluded from formal financial systems (the poor, the less educated, women and rural adults) are the same for Muslims and non-Muslims. Moreover, religion would be more cited as a barrier to financial inclusion by Muslims, but this result is due to respondents in Sub-Saharan Africa.

3.2.3. Informal financial inclusion

The shadow economy consists of legal production of goods and services that are neither taxed nor registered on purpose (Schneider and Enste, 2000) and therefore include informal finance.

Steel et al. (1997) provide information about informal finance in four African countries (Ghana, Malawi, Nigeria and Tanzania) with data covering 1992 and 1993. They explain that

African economies are composed of dualistic financial systems combining formal banks and informal financial agents. Two main reasons explain the existence of the informal financial sector. First, excessive state intervention leads to underdeveloped financial systems. Second, formal banks face costly procedures and problematic management, which contributes to low access to credit. They conclude that, in the medium term, informal financial agents have a positive impact by deepening the access to financial services for the broader population.

A major debate on informal finance deals with its substitutability with formal finance. De Koker and Jentzsch (2013) study the link between financial inclusion and financial integrity in eight African countries. They conclude that being formally included does not lead to a decline in the use of informal finance. On the contrary, owning a formal account would be positively related to the use of informal financial tools.

3.3. Data

We use the World Bank's 2014 Global Findex database to realize our analyses. The database is obtained thanks to surveys realized in 143 countries and covering almost 150,000 persons worldwide. The survey was carried out by Gallup, Inc., in association with its annual Gallup World Poll. Using randomly selected, nationally representative samples, roughly 1,000 people in each economy have been questioned using over 140 languages. The target population is the entire civilian, noninstitutionalized population aged 15 and above.

The Global Findex database provides a large number of indicators on financial inclusion enabling to assess the amount of account penetration, the use of financial services, the purposes and motivations, the alternatives to formal finance, etc... It also provides micro-level information – gender, age, income and education – that will be used in our estimations. 37 countries on the African continent are considered for our analysis²¹.

In line with former literature, we focus on the three main measures of financial inclusion. *Formal Account* refers to the fact that the individual has an account either at a

²¹ The countries included in our sample are: Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Chad, Congo Democratic Republic, Congo Republic, Côte d'Ivoire, Egypt, Ethiopia, Gabon, Ghana, Guinea, Kenya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Somalia, South Africa, Sudan, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe.

financial institution or through a mobile money provider. *Formal Saving* refers to the fact that the individual saved using an account at a financial institution in the past 12 months. *Formal Credit* refers to the fact that the individual borrowed from a financial institution in the past 12 months. All these variables are dummies equal to one if the person responded “yes” and zero otherwise.

In order to explain barriers to financial inclusion, people answer the following question: “Please tell me whether each of the following is a reason why you, personally, do not have an account at a bank or another type of formal financial institution”. Each of the answer is a dummy equal to one if the person answered “yes” and 0 otherwise. We have also information on mobile money banking: people were asked whether they use a mobile phone to realize transactions, to send or to receive money. The variable *Mobile Account* is equal to one if people answered “yes” and zero else. In order to be able to compare the use of traditional banking services and the use of mobile banking services, the variable *Account at a Financial Institution* gives information if respondents declare having a formal account at a financial institution and not with a mobile phone.

Respondents give their saving motivation. Three answers are proposed: a) to start, operate, or grow a business or farm; b) for old age; and c) for education or school fees. These three variables are dummies equal to one if people responded “yes”. People were also asked about their saving customs. The first question is the following: “in the past 12 months, have you, personally, saved or set aside money by a) using an account at a bank or another type of formal financial institution, b) using an informal savings club or a person outside the family”. The variable *Informal Saving* is equal to one if people answered “yes” to response b. The second question is the following: “in the past 12 months, have you, personally, saved or set aside any money for any reason”. The variable *Total Saving* is equal to one if people answered “yes” to this question.

Individuals also answer the following question: “in the past 12 months, have you, by yourself or together with someone else, borrowed money for any of the following reasons?” They could choose among three propositions: a) for education or school fees, b) for medical purposes, c) for farm or business purposes. This first question refers to any type of credit (both formal and informal). A fourth loan-taking option was given to the respondents with the following question: “do you, by yourself or together with someone else, currently have a loan you took out from a bank or another type of formal financial institution to purchase a home, an

apartment or land?”. It is important to keep in mind that this last question refers only to formal credit. People were also asked whether they borrowed money from another source than the formal one. Three informal sources are mentioned: a store, family and friends and another private lender. We compute these three sources to obtain the variable *Informal Credit*. The last variable *Total Credit* refers to the question “have you, by yourself or together with someone else, borrowed money from any source for any reason in the past 12 months?”

Table 3.1. presents the descriptive statistics for all financial inclusion indicators we use in the estimations. We provide the mean for our sample and compare it with the global mean computed at the worldwide level in Global Findex, so that we have a benchmark to compare Africa with the world.

Each of the three main indicators is lower in Africa in comparison with the world. 35 percent of Africans reported having a formal account while 61.5 percent of people worldwide did. 15.4 percent of Africans saved money at a formal financial institution in the past 12 months in comparison to the 27.4 global percent. Finally, formal credit is less important in Africa: 6.7 percent against 10.7 percent on a global scale. We can compare these figures to the study from Demirgüç-Kunt and Klapper (2012a) using data from 2011 Global Findex database. They observed that 23 percent of Africans owned a formal account, 11.5 percent saved money using a formal financial institutions and 5 percent of Sub-Saharan Africans borrowed money from a formal financial institution in 2011. Even if all the main indicators of financial inclusion are smaller in Africa in comparison to the world, they all increased from 2011 to 2014.

The main barrier to financial inclusion is lack of money in Africa (70.8%) like worldwide (59%). The next important self-reported barriers are “too expensive” (27.7%), “too far away” (25.6%), “cannot get one” (24.4%) and “lack of documentation” (21.5%). The least important barriers are “religious reasons” (7.2%) and “family member has an account” (7.6%). This latter result is of interest because this barrier is of greater importance worldwide (28%).

We observe interesting differences in mobile money banking: African individuals resort more to mobile account than people on a global scale (13.0% versus 2.0%). The African continent is at a leading position concerning mobile money banking, especially in East Africa where for example more than 73 percent of Kenyans are mobile money customers (Demombynes and Thegeya, 2012).

Saving habits are different on the African continent in comparison to the world. The main motivations of saving in Africa are “for education” (21.3%) and “for farm or business” (19.6%). While 23.9% of individuals worldwide and 40% of individuals of high-income economies save for old age, which is their main saving motivation (Demirgüç-Kunt et al., 2015), only 10.3% of African individuals do so.

We also observe a contrast between formal and informal saving. African people resort more to informal savings club or a person outside the family (21.6%) than to financial institution (15.4%) in order to set money aside. Moreover, we can notice that saving is a custom for African individuals (56.3%) in accordance with the trend worldwide (56.5%).

The main reason to take a loan in Africa is medical; 18.0% borrowed in the past 12 months for medical purposes. Education (11.8%) and farm or business (11.3%) are the following reasons provided by respondents. These trends are in accordance with what can be observed on a global scale, with respectively 12.2% for medical purposes, 7.7% for education and 7.1% for farm or business, but the percentages are higher in Africa. Moreover, 6.2% declared having a formal loan to purchase a home or land.

The main source of credit in Africa is “family and friends” (37.5%). This figure is higher than the global percent (26.2%). The second source of credit in Africa is “a store” (7.9%), in line with the global trend (7.9%). Borrowing formally (6.7%) and borrowing from another private lender (4.7%) are less common in Africa. 41.0 percent of African individuals reported having borrowed from an informal source. Just like informal saving, informal credit is important on the African continent. Finally, 51.4 percent of African individuals declared having borrowed from any source in the past 12 months, a figure which is higher than the 42.4 global percent. Resorting to credit is therefore a rather common phenomenon on the continent.

3.4. Estimations

This section is devoted to the presentation of our main empirical findings. We first describe the methodology. We then present the results for the determinants of the main financial inclusion indicators. Next, we provide the findings for the determinants of barriers to financial

inclusion. We complete this overview of the determinants of financial inclusion by examining what influences the use of mobile money banking.

3.4.1. Methodology

In order to evaluate the determinants of financial inclusion in Africa, we perform probit estimations and use the following equation:

$$X_i = \alpha + \beta * Gender_i + \sigma * Age_i + \varphi * Income_i + \rho * Education_i + \varepsilon_i$$

where X is the financial inclusion variable and i represents one given individual. The individual characteristics are the explanatory variables.

Gender is a dummy variable equal to one if the individual is a woman (*Female*) and zero else. Age is represented with two measures: one with the number of years (*Age*) and the second is its squared (*Age*²) in order to control for a possible nonlinear relation between age and financial inclusion.

To take income into account, we use four dummy variables (*Poorest 20%*, *Second 20%*, *Third 20%* and *Fourth 20%*). The fifth richest quintile is the omitted dummy variable. *Poorest 20%* is a dummy variable equal to one if income is in the first income quintile, zero otherwise, and so on for the other dummies. Concerning education, we use two dummy variables: *Secondary Education* and *Tertiary Education*. *Secondary Education* is equal to one if the individual has completed secondary education, zero otherwise. *Tertiary Education* is equal to one if the individual has completed tertiary education or more, zero otherwise. The omitted dummy variable is primary school or less. Table 3.2. reports the descriptive statistics for the individual characteristics.

3.4.2. Determinants of main financial inclusion indicators

Table 3.3. displays the results and the marginal effects of the probit estimations for the main indicators of financial inclusion. Formal account, formal saving and formal credit are our dependent variables.

We observe that all individual characteristics have a significant relation with financial inclusion. Being a woman significantly reduces the probability of having a formal account or a formal saving, while no significant result is observed concerning formal credit. Age has a nonlinear relation with all three indicators of financial inclusion, with a positive and significant coefficient for *Age* and a significantly negative for *Age*². Hence older people are more likely to be financially included, but after a certain age, the probability of being financially included diminishes.

We find that greater income is associated with higher financial inclusion. Dummy variables for income are all significantly negative for the three indicators of financial inclusion, with larger coefficients for income quintile dummies indicating lower income. Education is positively associated with all indicators of financial inclusion. We observe significantly positive coefficients for *Secondary Education* and *Tertiary Education* for the three indicators of financial inclusion, with higher coefficients for the latter one. Like Allen et al. (2016) worldwide and Fungáčová and Weill (2015) in China, we find that richer and more educated adults are more likely to be financially included and that age has a non-linear relation with financial inclusion. We find that being a woman significantly decreases the likelihood of owning an account in Africa like Fungáčová and Weill (2015) do in China. However, Allen et al. (2016) do not find a significant gender gap in account ownership on the global scale.

Thanks to the calculation of the marginal effects, we can conclude that education and income are the most important individual characteristics explaining formal inclusion. For a person who has tertiary education, the probability of having a formal account increases from 44.0%, the probability of saving at a formal financial institution increases from 31.9% and the probability of borrowing money from a formal financial institution increases from 10.1%. However, we can notice that being a woman decreases the probability of having a formal account from 3.1% and the probability of saving at a formal institution from 1.3%. This result highlights the fact that gender is not the main explanation of formal exclusion in Africa.

To sum it up, we observe that being a man, richer, more educated and older to a certain extent favor access to formal financial services in Africa with a particular influence of education and income.

3.4.3. Determinants of barriers to financial inclusion

We examine how individual characteristics exert an impact on the reasons for not having a formal account. We perform estimations in which we explain each of the seven barriers to financial inclusion reported in the survey. Table 3.4. reports the estimations. Before analysing our results, it is important to point out the difference between voluntary and involuntary exclusion as explained by Allen et al. (2016). People choose not to own an account because of a lack of money or for cultural reasons. Thus, “Lack of Money”, “Religious Reasons” and “Family Member has an Account” are categorized as voluntary self-excluded barriers. Involuntary exclusion, however, is driven by market failures. Distance, high cost, documentation requirements and lack of trust are involuntary self-excluded barriers. Such differentiation between voluntary and involuntary barriers helps building policy recommendations.

Gender is associated with several barriers to financial inclusion but in opposite directions: “Lack of Money” and “Family Member has an Account” play a stronger role for women. However, the fact that the bank is far away or too expensive, the lack of documentation, the lack of trust and religious reasons are less important barriers for women. We are then able to conclude that exclusion for women is more voluntary. Cultural reasons are behind the exclusion of women from financial inclusion in Africa, while market failures are overall not responsible for gender discrimination. This result is in line with the findings of Aterido, Beck and Iacovone (2013) who show that the existing gender gap in the financial sector is due to female participation in the economy and not within the financial sector itself. Legal and social norms (Demirgüç-Kunt, Klapper and Singer, 2013) and female participation in the economy thanks to education and formal employment (Aterido, Beck and Iacovone, 2013) are responsible for the gender gap in formal financial services access, highlighting the role of country characteristics influencing financial exclusion.

With age, lack of money seems to be a decreasing problem, while new issues emerge for older people: distance, cost, trust and religion become more problematic. Income is associated with distance, cost, documentation requirements, lack of money and affordability. All these criteria represent barriers for poorer persons. Instead, religious reasons, the fact that a family member has an account and lack of trust are less important barriers for poor people.

The results with education are of particular interest. Education is negatively associated with all barriers with the only exception being the fact that family member has an account. Barriers to financial inclusion would decrease with education, no matter what the barrier is. The only reason why more educated people would not be financially included would be the fact that a family member already has an account, which is a voluntary self-excluded barrier. Education and income, which are the main drivers of financial inclusion in Africa as we saw it earlier, are associated with different barriers, a trend also found by Fungáčová and Weill (2015) in China.

3.4.4. Determinants of mobile money banking

We complete the analysis of the determinants of financial inclusion by examining what shapes the use of mobile money banking. This form of banking has become more common in Africa and raises questions about the characteristics of individuals using it.

We provide a comparative analysis of the determinants of financial inclusion for the use of mobile banking services and for the use of traditional banking services in Table 3.5. The main conclusion is that mobile banking is driven by the same determinants than traditional banking in Africa. All individual characteristics have the same link with both forms of banking services.

Being a woman decreases the probability of having a mobile account and of owning a formal account (-1.9% and -1.7%). Mobile money does not help women to be financially included. Age has a non-linear relation. Income is negatively related to mobile account and formal account at a financial institution. Being poorer decreases the likelihood of resorting to formal account and mobile account (-7.6% and -18.7% for the poorest quintile). Instead, both secondary and tertiary education are positively associated with all the indicators. More educated people are more likely to have a mobile account and a formal account. The coefficients are especially high regarding tertiary education (15.2% and 48.4%).

3.5. Understanding what shapes financial inclusion in Africa

This section provides evidence to provide a broad overview of the determinants of financial inclusion in Africa. We now focus on questions of particular relevance for developing

countries like African ones related to informal finance, and motives for use of financial services. First, we examine saving behaviour by considering two questions: the motives for formal saving, and informal saving. Second, we study credit behaviour by studying the motives for formal credit, and those for informal credit.

3.5.1. Understanding saving behaviour

We dig deeper our analysis of the determinants of the saving behaviour by considering now the three different motivations for saving: “for farm or business”, “for old age”, and “for education”. We question whether these motivations would not be influenced by the individual characteristics.

Table 3.6. reports these estimations. The main conclusion is that the three motivations are related the same way by all individual characteristics. In other words, saving behaviour is not affected differently by gender, age, income, or education, according to the motivation for saving.

Being a woman decreases the probability of the three saving motivations, particularly for farm and business (-5.2%). It seems to be an illustration of gender discrimination in saving. Concerning age, we can observe that the likelihood of each saving motivation increases, in particular for education. Income is negatively associated with each motivation, illustrating the fact that being poorer decreases the probability of saving for any motivation. However, we can observe that the coefficients are more negative for old age, meaning that this is the least important motivation for saving. Education is positively related to each saving motivation, illustrating the fact that education increases the probability of saving for any motivation. We can observe that the coefficients are particularly high for old age and for education, with 6.2 percent and 14.1 percent probabilities for old age and 11.4 percent and 18.1 percent probabilities for education.

We now investigate if informal saving behavior has different determinants. We provide estimations explaining informal saving and compare them with total saving in Table 3.7. The most striking observation deals with the observation that two individual characteristics play a different role for informal saving than for formal saving. First, being a woman increases the probability of informal saving while it decreases the likelihood of saving at a formal financial institution (5.4% versus -1.3%). This result illustrates the fact that African women resort more

to informal finance than to formal finance. However, informal finance does not seem to offset the gender gap in formal finance. The probability of setting money aside in the past 12 months for a woman is -2.1%. Second, education does not have any influence on informal saving while it increases the likelihood of saving formally. *Secondary Education* and *Tertiary Education* are not significant when explaining informal saving.

For the rest, age and income have the same relation with informal saving and formal saving. Age has a non-linear relation with both forms of saving. Getting older increases the likelihood of being financially included, either formally or informally, until a certain age after which the likelihood decreases. Income is negatively related to informal saving and formal saving. Being poorer decreases the probability of being included by any way. The probability of saving in the past 12 months is -19.9 percent for the poorest individuals.

3.5.2. Understanding credit behaviour

We investigate the determinants of credit behaviour by focusing on the motivations for asking for a loan. Four potential motivations can be provided (“for education”, “for medical purposes”, “for farm or business” for both formal and informal credit; “to purchase a home, an apartment or land” for formal credit only) and we examine how they are related to individual characteristics. Table 3.8. displays these estimations.

First, concerning the three loan-taking motivations for both formal and informal credit, overall we observe that loan-taking motivations strongly differ with the individual characteristics. Only age has the same relation with all three loan-taking motivations: the relation is non-linear. The likelihood of borrowing for any purpose increases and then decreases after a certain age. For the rest, the loan-taking motives differ with gender, income, and education.

Being a woman decreases the likelihood of borrowing for farm and business (-2.1%) but has no significant impact on the two other loan-taking motivations. Hence business-driven loans are more requested by men, but no gender difference is observed when it comes to loans for education or for medical purposes. Income is positively related to loans asked for medical purposes for all income quintiles with higher coefficients for lower income quintiles. It therefore means that being poorer increases the likelihood of borrowing for medical purposes. Income is also positively related to loans requested for education but it is only significant for

the second, third and fourth income quintiles. In other words, people in these quintiles are more likely to borrow money for education purposes. However, income is negatively related to loans motivated by farm and business, with coefficients decreasing when income increases. Hence being poorer decreases the likelihood of relying on credit for farm or business purposes. Overall these results suggest that poorer people ask more for loans related to medical purposes and to education but less for loans related to business.

Secondary Education and *Tertiary Education* are both positively associated with education motive, while they are negatively related to medical purposes and farm or business. Thus, being more educated decreases the probability of resorting to credit for medical purposes and for farm or business purposes but increases the probability of borrowing money for education purposes.

Concerning the taking out of a formal loan to purchase a home, an apartment or land, results are quite different. First, being a woman decreases the likelihood of taking out such loan by 0.6 percent. Thus, women are discriminated concerning credit for business and home purchasing. Older people are more likely to take out a loan to purchase a home until a certain age. Being poorer decreases the probability of taking out such loan. Finally, more educated people are more likely to take out such loan; having validated *Secondary Education* increases the likelihood by 3.4 percent and *Tertiary Education* by 9.7 percent.

We can then wonder if informal credit is different from formal credit when it comes to individual determinants. We have information on different alternative sources of borrowing than formal credit: “a store”, “family and friends”, “another private lender”. We then provide estimations by considering each of these alternative sources of credit as the dependent variable in Table 3.9. We also consider them all together with the variable Informal Credit and gather all possibilities of informal and formal credit with the occurrence “Borrowed in the past 12 months”.

We overall find that the use of the alternative sources of borrowing varies with gender and income, while no different pattern is observed for age and education. Being a woman only decreases the likelihood of resorting to another private lender for credit. However, the probability for a woman to borrow money at an informal source is -1.1%, meaning that women are less likely to borrow informally. Fungáčová and Weill (2015) find a different result in China, showing that gender does not impact the selection between informal and formal credit.

Moreover, as we found no significant link between gender and formal credit, it means that women are not more likely to borrow formally to offset their disadvantage in informal credit. While women are more likely to save informally, they are not more inclined to borrow informally. Age is positively associated with each of the four alternative sources of borrowing.

Income influences the choice between informal credit and formal credit. We observe that dummies for the second, third and fourth quintile are significant and positive, meaning that individuals from these income quintiles use more informal credit than individuals with the highest income. These findings have to be related to the result that higher income was positively related to use of formal credit.

When considering the sources for informal credit, we do not see any link between income and borrowing from another private lender. Regarding loans from a store, only the poorest income quintile has a significant coefficient which is negative, supporting the view that poorest people have lower probability to have a credit from a store. However, we see most coefficients for income quintiles which are significant when it comes to borrowing from family and friends: we then observe positive and significant coefficients for dummies for the second, third, and fourth quintile. All together these results mean that poorer people (with the exception of the poorest ones) use more informal credit and this credit comes mainly from family and friends.

The relation with education presents a similar pattern with all forms of borrowing. *Secondary Education* is positively associated with all forms of borrowing, while *Tertiary Education* has a positive coefficient in all cases which is always significant with the exception of borrowing money from family and friends. Having validated secondary education increases the probability of borrowing from an informal source by 2.6% and of borrowing from a formal financial institution by 3.9%. Having validated tertiary education increases the likelihood of borrowing from an informal source by 2.7% and of borrowing from a formal financial institution by 10.1%. People who completed at least the secondary school are more likely to borrow money from a formal financial institution even if they are also more inclined to borrow informally. Once again, this result is of prime interest because we find no significant relation between education and informal saving but do so for informal credit.

3.6. Conclusion

African countries have low financial inclusion in comparison with the rest of the world. As financial inclusion can contribute to alleviate poverty and boost economic growth, understanding the determinants of financial inclusion in Africa is a major issue. In this paper, we investigate this question for a large sample of individuals from 37 African countries. Our main findings can be summarized as follows.

First, we find that being a man, richer, more educated and older to a certain extent favour financial inclusion with a higher influence of education and income. This finding supports the view that policies favouring financial inclusion should target certain groups of population like women and young people. We also show that mobile banking is driven by the same determinants than traditional banking in Africa. There is consequently no different pattern to explain the use of this alternative form of banking.

Second, we show that barriers to financial inclusion differ with individual characteristics. We notably observe that education is negatively associated with most barriers, while gender is associated with several barriers in opposite directions.

Third, the determinants of informal finance can differ from the ones of formal finance as shown by the different role for gender and education. Being a woman increases informal saving while it decreases formal saving, in line with the view that African women resort more to informal finance than to formal finance. However, this conclusion is not true when it comes to credit: being a woman reduces informal credit while it has no impact on formal credit. Education is positively associated with formal and informal credit, but when it comes to saving we only observe a positive relation with formal saving.

Fourth, the analysis of the motivations leads to opposite conclusions for saving and for borrowing. On the one hand, the three motivations for saving have the same determinants. We do not observe any differences when it comes to save for business, for age, or for education. On the other hand, the loan-taking motivations strongly differ with individual characteristics. Poorer people ask more for loans related to medical purposes and to education, while richer people ask more for loans motivated by business and to buy a home, an apartment or land. Educated people ask more for loans to finance education but less to finance medical purposes or business. They also resort more to formal credit in order to purchase a home or land. Women borrow less for business or land purchasing.

To sum it up, our work contains findings of particular interest to design policies to foster financial inclusion in Africa. It stresses the role of policies targeting groups of population particularly affected by financial exclusion and identifies the main obstacles they face. It puts into evidence that mobile banking is driven by the same determinants and as such can be a substitute for financial inclusion for these groups of population. It stresses that informal finance is not a substitute for formal finance in all aspects of financial inclusion in Africa.

References

- Allen, F., Demirgüç-Kunt, A., Klapper, L., Peria, M.S.M., 2016. The Foundations of Financial Inclusion: Understanding Ownership and Use of Formal Accounts. *Journal of Financial Intermediation*, 27, 1-30.
- Aterido, R., Beck, T., Iacovone, L., 2013. Access to Finance in Sub-Saharan Africa: Is There a Gender Gap? *World Development* 47, 102 – 120.
- Beck, T., Cull, R., 2015. Banking in Africa, in: *The Oxford Handbook of Banking*, Oxford University Press. Allen N. Berger, Philip Molyneux and John O.S. Wilson, pp. 913 – 937.
- Bruhn, M., Love, I., 2014. The Real Impact of Improved Access to Finance: Evidence from Mexico. *Journal of Finance* LXIX, 1347–1376.
- De Koker, L., Jentzsch, N., 2013. Financial Inclusion and Financial Integrity: Aligned Incentives? *World Development* 44, 267–280.
- Demirgüç-Kunt, A., Klapper, L., 2012a. Financial Inclusion in Africa. An Overview (Policy Research Working Paper No. 6088). The World Bank, Washington, DC.
- Demirgüç-Kunt, A., Klapper, L., 2012b. Measuring Financial Inclusion. The Global Findex Database (Policy Research Working Paper No. 6025). The World Bank, Washington, DC.
- Demirgüç-Kunt, A., Klapper, L., Randall, D., 2013. Islamic Finance and Financial Inclusion: Measuring Use of and Demand for Formal Financial Services among Muslim Adults (Policy Research Working Paper No. 6642). The World Bank, Washington, DC.
- Demirgüç-Kunt, A., Klapper, L., Singer, D., 2013. Financial Inclusion and Legal Discrimination Against Women: Evidence from Developing Countries (Policy Research Working Paper No. 6416). The World Bank, Washington, DC.
- Demirgüç-Kunt, A., Klapper, L., Singer, D., Van Oudheusden, P., 2015. The Global Findex Database 2014. Measuring Financial Inclusion Around the World (Policy Research Working Paper No. 7255). The World Bank, Washington, DC.
- Demombynes, G., Thegeya, A., 2012. Kenya's Mobile Revolution and the Promise of Mobile Savings (Policy Research Working Paper No. 5988). The World Bank, Washington, DC.
- Fungáčová, Z., Weill, L., 2015. Understanding Financial Inclusion in China. *China Economic Review* 34, 196–206.

- Han, R., Melecky, M., 2013. Financial Inclusion for Financial Stability. Access to Bank Deposits and the Growth of Deposits in the Global Financial Crisis (Policy Research Working Paper No. 6577). The World Bank, Washington, DC.
- Kostov, P., Arun, T., Annim, S., 2015. Access to Financial Services: The Case of the “Mzansi” Account in South Africa. *Review of Development Finance* 5, 34–42.
- Mlachila, M., Dykes, D., Zajc, S., Aithnard, P.-H., Beck, T., Ncube, M., Nelvin, O., 2013a. Banking in Sub-Saharan Africa: Challenges and Opportunities. The European Investment Bank.
- Mlachila, M., Park, S.G., Yabara, M., 2013b. Banking in Sub-Saharan Africa: The Macroeconomic Context. International Monetary Fund.
- Schneider, F., Enste, D.H., 2000. Shadow Economies: Size, Causes, and Consequences. *Journal of Economic Literature* 38, 77–114.
- Steel, W.F., Aryeetey, E., Hettige, H., Nissanke, M., 1997. Informal Financial Markets Under Liberalization in Four African Countries. *World Development* 25, 817–830.
- Swamy, V., 2014. Financial Inclusion, Gender Dimension, and Economic Impact on Poor Households. *World Development* 56, 1–15.

Tables

Table 3.1. Descriptive statistics for the dependent variables in the estimations

This table displays the descriptive statistics for the dependent variables studied in our estimations: the main indicators of financial inclusion, barriers to financial inclusion, mobile money banking, saving motivation, informal saving, loan-taking motivation and informal credit.

	Obs	Mean	Std Dev	Global Mean
<i>Main Indicators of Financial Inclusion:</i>				
Formal Account	37,102	0.350	0.477	0.615
Formal Saving	36,841	0.154	0.361	0.274
Formal Credit	36,869	0.067	0.249	0.107
<i>Barriers to Financial Inclusion:</i>				
Too Far Away	26,257	0.256	0.436	0.210
Too Expensive	25,546	0.277	0.448	0.220
Lack of Documentation	26,311	0.215	0.411	0.180
Lack of Trust	26,110	0.131	0.338	0.120
Lack of Money	26,442	0.708	0.454	0.590
Religious Reasons	26,282	0.072	0.258	0.050
Family Member has an Account	26,172	0.076	0.265	0.280
Cannot Get an Account	26,211	0.244	0.429	0.160
No Need for Financial Services	26,330	0.196	0.397	0.300
<i>Mobile Money Banking:</i>				
Account at a Financial Institution	37,102	0.297	0.457	0.607
Mobile Account	34,100	0.130	0.336	0.020
<i>Saving Motivation:</i>				
For Farm or Business	36,913	0.196	0.397	0.138
For Old Age	36,865	0.103	0.304	0.239
For Education	36,906	0.213	0.410	0.223
<i>Saving:</i>				
Informal Saving	36,834	0.216	0.411	-
Saved Any Money in the Past 12 Months	37,102	0.563	0.496	0.565
<i>Loan-Taking Motivation:</i>				
For Education	36,942	0.118	0.323	0.077
For Medical Purposes	36,938	0.180	0.384	0.122
For Farm or Business	36,927	0.113	0.316	0.071
To Purchase a Home or Land	36,845	0.062	0.241	-
<i>Informal Credit:</i>				
A Store	35,834	0.079	0.269	0.079
Family and Friends	36,876	0.375	0.484	0.262
Another Private Lender	36,781	0.047	0.211	0.046
Informal Credit	37,014	0.410	0.492	-
All Sources	37,034	0.514	0.496	0.424

Table 3.2. Descriptive statistics for the individual characteristics

This table displays the definition and the descriptive statistics for the individual characteristics used in our estimations.

	Definition	Obs	Mean	Std Dev
Female	Dummy variable equal to one if the individual is a woman, zero otherwise.	37,102	0.493	0.500
Age	Age in number of years.	37,072	34.952	15.317
Income - Poorest 20%	Dummy variable equal to one if income is in the first income quintile, zero otherwise.	37,102	0.165	0.371
Income - Second 20%	Dummy variable equal to one if income is in the second income quintile, zero otherwise.	37,102	0.173	0.379
Income - Third 20%	Dummy variable equal to one if income is in the third income quintile, zero otherwise.	37,102	0.186	0.389
Income - Fourth 20%	Dummy variable equal to one if income is in the fourth income quintile, zero otherwise.	37,102	0.211	0.408
Income - Richest 20%	Dummy variable equal to one if income is in the fifth income quintile, zero otherwise.	37,102	0.264	0.441
Primary Education	Dummy variable equal to one if the individual has completed primary school or less, zero otherwise.	37,102	0.534	0.499
Secondary Education	Dummy variable equal to one if the individual has completed secondary education, zero otherwise.	37,102	0.411	0.492
Tertiary Education	Dummy variable equal to one if the individual has completed tertiary education or more, zero otherwise.	37,102	0.051	0.221

Table 3.3. Determinants of the main financial inclusion indicators in Africa

This table displays probit estimations of the determinants of the main indicators of financial inclusion in Africa. *Formal Account*, *Formal Saving* and *Formal Credit* are the dependent variables. Individual characteristics are the explanatory variables: gender, age, income and education, as described in Table 3.2. Estimated marginal effects are presented and standard errors are in parentheses. *** denotes significance at the 1% level, ** denotes significance at the 5% level, and * denotes significance at the 10% level.

	Formal Account	Formal Saving	Formal Credit
Female	-0.031*** (0.005)	-0.013*** (0.003)	-0.002 (0.002)
Age	0.021*** (0.001)	0.013*** (0.001)	0.008*** (0.000)
Age ²	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Income - Poorest 20%	-0.210*** (0.006)	-0.106*** (0.003)	-0.037*** (0.003)
Income - Second 20%	-0.184*** (0.006)	-0.102*** (0.003)	-0.030*** (0.003)
Income - Third 20%	-0.132*** (0.007)	-0.076*** (0.004)	-0.020*** (0.003)
Income - Fourth 20%	-0.088*** (0.007)	-0.050*** (0.004)	-0.020*** (0.003)
Secondary Education	0.259*** (0.006)	0.142*** (0.004)	0.039*** (0.003)
Tertiary Education	0.440*** (0.011)	0.319*** (0.013)	0.101*** (0.009)
Number of observations	37072	36811	36840
Pseudo R ²	0.125	0.131	0.069
Log likelihood	-20985.434	-13755.453	-8398.006
Predicted probability (at mean values)	0.331	0.123	0.054

Table 3.4. Determinants of barriers to financial inclusion

This table displays probit estimations of the determinants of barriers to financial inclusion in Africa. Each barrier, presented at the top of each column, is the dependent variable. Individual characteristics are the explanatory variables: gender, age, income and education, as described in Table 3.2. Estimated marginal effects are presented and standard errors are in parentheses. *** denotes significance at the 1% level, ** denotes significance at the 5% level, and * denotes significance at the 10% level.

	Too Far Away	Too Expensive	Lack of Documentation	Lack of Trust	Lack of Money	Religious reasons	Family Member has an Account	Cannot Get an Account	No Need for Financial Services
Female	-0.054*** (0.005)	-0.024*** (0.006)	-0.005 (0.005)	-0.015*** (0.004)	0.012* (0.006)	-0.009** (0.003)	0.023*** (0.003)	-0.011* (0.005)	-0.001 (-0.005)
Age	0.002** (0.001)	0.005*** (0.001)	-0.010*** (0.001)	0.003*** (0.001)	-0.002* (0.001)	0.001** (0.001)	-0.002*** (0.001)	-0.005*** (0.001)	-0.000 (-0.001)
Age ²	-0.000** (0.000)	-0.000*** (0.000)	0.000*** (0.000)	-0.000*** (0.000)	0.000 (0.000)	-0.000* (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)
Income - Poorest 20%	0.039*** (0.009)	0.024** (0.009)	0.040*** (0.009)	0.001 (0.007)	0.061*** (0.008)	-0.014** (0.005)	-0.018*** (0.005)	0.056*** (0.009)	0.001 (0.008)
Income - Second 20%	0.040*** (0.009)	0.016 (0.009)	0.035*** (0.009)	-0.001 (-0.007)	0.091*** (0.008)	-0.010* (0.005)	-0.022*** (0.004)	0.051*** (0.009)	0.000 (0.008)
Income - Third 20%	0.030*** (0.009)	0.016 (0.009)	0.039*** (0.009)	-0.002 (-0.007)	0.073*** (0.008)	-0.015** (0.004)	-0.018*** (0.004)	0.043*** (0.009)	-0.004 (-0.008)
Income - Fourth 20%	0.022* (0.009)	0.021* (0.009)	0.029*** (0.008)	-0.013* (0.006)	0.052*** (0.008)	-0.008 (0.005)	-0.008 (0.005)	0.028*** (0.009)	0.007 (0.008)
Secondary Education	-0.078*** (0.006)	-0.024*** (0.006)	-0.056*** (0.005)	-0.007 (0.005)	-0.052*** (0.006)	-0.017*** (0.003)	0.026*** (0.004)	-0.054*** (0.006)	-0.006 (0.005)
Tertiary Education	-0.132*** (0.013)	-0.083*** (0.017)	-0.134*** (0.011)	0.008 (0.014)	-0.036 (0.020)	-0.012 (0.009)	0.052*** (0.014)	-0.075*** (0.016)	-0.039* (0.015)
Number of observations	26235	25524	26289	26088	26421	26260	26150	26190	26308
Pseudo R ²	0.012	0.003	0.017	0.002	0.008	0.004	0.012	0.007	0.002
Log likelihood	-14737.956	-15013.828	-13464.160	-10126.074	-15823.238	-6746.667	-6971.212	-14436.999	-12962.180
Predicted probability (at mean values)	0.253	0.276	0.211	0.131	0.710	0.071	0.074	0.242	0.195

Table 3.5. Determinants of mobile money banking in Africa

This table displays probit estimations of the determinants of mobile money banking in Africa. The dependent variables are presented at the top of each column. Individual characteristics are the explanatory variables: gender, age, income and education, as described in Table 3.2. Estimated marginal effects are presented and standard errors are in parentheses. *** denotes significance at the 1% level, ** denotes significance at the 5% level, and * denotes significance at the 10% level.

	Mobile Account	At a Financial Institution
Female	-0.019*** (0.003)	-0.017*** (0.005)
Age	0.008*** (0.001)	0.020*** (0.001)
Age ²	-0.000*** (0.000)	-0.000*** (0.000)
Income - Poorest 20%	-0.076*** (0.004)	-0.187*** (0.005)
Income - Second 20%	-0.067*** (0.004)	-0.166*** (0.006)
Income - Third 20%	-0.047*** (0.004)	-0.122*** (0.006)
Income - Fourth 20%	-0.036*** (0.004)	-0.081*** (0.006)
Secondary Education	0.060*** (0.004)	0.270*** (0.005)
Tertiary Education	0.152*** (0.012)	0.484*** (0.011)
Number of observations	34073	37072
Pseudo R ²	0.057	0.147
Log likelihood	-12393.534	-19234.658
Predicted probability (at mean values)	0.115	0.268

Table 3.6. Determinants of saving motivation

This table displays probit estimations of the determinants of saving motivation in Africa. Each saving motivation is a dependent variable and is presented at the top of each column. Individual characteristics are the explanatory variables: gender, age, income and education, as described in Table 3.2. Estimated marginal effects are presented and standard errors are in parentheses. *** denotes significance at the 1% level, ** denotes significance at the 5% level, and * denotes significance at the 10% level.

	For Farm or Business	For Old Age	For Education
Female	-0.052*** (0.004)	-0.016*** (0.003)	-0.010* (0.004)
Age	0.016*** (0.001)	0.008*** (0.000)	0.017*** (0.001)
Age ²	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Income - Poorest 20%	-0.102*** (0.005)	-0.067*** (0.003)	-0.076*** (0.006)
Income - Second 20%	-0.079*** (0.005)	-0.057*** (0.003)	-0.043*** (0.006)
Income - Third 20%	-0.061*** (0.005)	-0.050*** (0.003)	-0.030*** (0.006)
Income - Fourth 20%	-0.029*** (0.005)	-0.036*** (0.003)	-0.018** (0.006)
Secondary Education	0.012** (0.004)	0.062*** (0.003)	0.114*** (0.005)
Tertiary Education	0.030** (0.010)	0.141*** (0.010)	0.181*** (0.012)
Number of observations	36883	36835	36876
Pseudo R ²	0.037	0.095	0.047
Log likelihood	-17599.994	-11074.668	-18217.877
Predicted probability (at mean values)	0.186	0.083	0.202

Table 3.7. Determinants of informal saving

This table displays probit estimations of the determinants of informal saving in Africa. The dependent variables are presented at the top of each column. Individual characteristics are the explanatory variables: gender, age, income and education, as described in Table 3.2. Estimated marginal effects are presented and standard errors are in parentheses. *** denotes significance at the 1% level, ** denotes significance at the 5% level, and * denotes significance at the 10% level.

	Informal Saving	Formal Saving	Saved in the Past 12 Months
Female	0.054*** (0.004)	-0.013*** (0.003)	-0.021*** (0.005)
Age	0.014*** (0.001)	0.013*** (0.001)	0.023*** (0.001)
Age ²	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Income - Poorest 20%	-0.073*** (0.006)	-0.106*** (0.003)	-0.199*** (0.008)
Income - Second 20%	-0.034*** (0.006)	-0.102*** (0.003)	-0.142*** (0.008)
Income - Third 20%	-0.014* (0.006)	-0.076*** (0.004)	-0.107*** (0.008)
Income - Fourth 20%	-0.002 (0.006)	-0.050*** (0.004)	-0.063*** (0.008)
Secondary Education	0.007 (0.005)	0.142*** (0.004)	0.098*** (0.006)
Tertiary Education	0.010 (0.010)	0.319*** (0.013)	0.169*** (0.011)
Number of observations	36806	36811	37072
Pseudo R ²	0.019	0.131	0.047
Log likelihood	-18816.737	-13755.453	-24203.260
Predicted probability (at mean values)	0.210	0.123	0.567

Table 3.8. Determinants of loan-taking motivation

This table displays probit estimations of the determinants of loan-taking motivation in Africa. Each loan-taking motivation is a dependent variable and is presented at the top of each column. Individual characteristics are the explanatory variables: gender, age, income and education, as described in Table 3.2. Estimated marginal effects are presented and standard errors are in parentheses. *** denotes significance at the 1% level, ** denotes significance at the 5% level, and * denotes significance at the 10% level.

	For Education	For Medical Purposes	For Farm or Business	To Purchase a Home or Land
Female	0.003 (0.003)	-0.000 (0.004)	-0.021*** (0.003)	-0.006* (0.002)
Age	0.007*** (0.001)	0.009*** (0.001)	0.010*** (0.001)	0.006*** (0.000)
Age ²	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Income - Poorest 20%	0.009 (0.006)	0.061*** (0.007)	-0.041*** (0.004)	-0.036*** (0.002)
Income - Second 20%	0.020*** (0.006)	0.041*** (0.007)	-0.025*** (0.004)	-0.028*** (0.003)
Income - Third 20%	0.020*** (0.005)	0.041*** (0.007)	-0.022*** (0.004)	-0.022*** (0.003)
Income - Fourth 20%	0.016** (0.005)	0.028*** (0.006)	-0.016*** (0.004)	-0.019*** (0.003)
Secondary Education	0.042*** (0.004)	-0.023*** (0.004)	-0.018*** (0.003)	0.034*** (0.003)
Tertiary Education	0.041*** (0.009)	-0.040*** (0.008)	-0.017* (0.007)	0.097*** (0.009)
Number of observations	36912	36908	36897	36816
Pseudo R ²	0.012	0.013	0.018	0.062
Log likelihood	-13251.846	-17183.067	-12773.017	-8005.959
Predicted probability (at mean values)	0.115	0.177	0.108	0.052

Table 3.9. Determinants of alternative sources of borrowing

This table displays probit estimations of the determinants of alternative sources of borrowing in Africa. Each alternative source of borrowing is a dependent variable and is presented at the top of each column. Individual characteristics are the explanatory variables: gender, age, income and education, as described in Table 3.2. Estimated marginal effects are presented and standard errors are in parentheses. *** denotes significance at the 1% level, ** denotes significance at the 5% level, and * denotes significance at the 10% level.

	A Store	Family and Friends	Another Private Lender	Informal Credit	Formal Credit	Borrowed in the Past 12 Months
Female	0.004 (0.003)	-0.008 (0.005)	-0.005* (0.002)	-0.011* (0.005)	-0.002 (0.002)	-0.018*** (0.005)
Age	0.005*** (0.001)	0.012*** (0.001)	0.003*** (0.000)	0.014*** (0.001)	0.008*** (0.000)	0.018*** (0.001)
Age ²	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Income - Poorest 20%	-0.018*** (0.004)	0.009 (0.008)	0.007 (0.004)	0.000 (0.008)	-0.037*** (0.003)	-0.017* (0.008)
Income - Second 20%	-0.002 (0.004)	0.030*** (0.008)	0.003 (0.004)	0.028*** (0.008)	-0.030*** (0.003)	0.008 (0.008)
Income - Third 20%	-0.004 (0.004)	0.028*** (0.008)	0.006 (0.003)	0.026** (0.008)	-0.020*** (0.003)	0.007 (0.008)
Income - Fourth 20%	0.000 (0.004)	0.033*** (0.007)	0.003 (0.003)	0.028*** (0.008)	-0.020*** (0.003)	0.007 (0.008)
Secondary Education	0.011*** (0.003)	0.019*** (0.005)	0.010*** (0.002)	0.026*** (0.006)	0.039*** (0.003)	0.030*** (0.006)
Tertiary Education	0.063*** (0.009)	0.009 (0.012)	0.013* (0.006)	0.027* (0.012)	0.101*** (0.009)	0.047*** (0.012)
Number of observations	35807	36846	36751	36984	36840	37072
Pseudo R ²	0.015	0.007	0.008	0.008	0.069	0.013
Log likelihood	-9711.116	-24196.755	-6881.669	-24825.810	-8398.006	-25045.367
Predicted probability (at mean values)	0.076	0.374	0.045	0.409	0.054	0.514

Chapter 4²²

Regional Foreign Banks and Financial Inclusion: Evidence from Africa

Abstract

The expansion of regional foreign banks in developing countries raises many issues regarding their impact on host economies. We question whether the development of African regional foreign banks, also named Pan-African banks, influences financial inclusion of firms and households. To this end, we realize probit and instrumental variable approaches. We combine a sample of 230 banks with the World Bank Global Findex in 2011 and 2014 and World Bank Enterprise Surveys for the period 2006-2014. We find that regional foreign banks presence increases firms' access to credit while a less robust result is found for households' financial inclusion. We thus support the fact that bank ownership influences financial inclusion. Regional foreign banks increase financial inclusion thanks to a combination of foreign banks' technical advantages and local banks' informational advantages.

JEL Classification: G21; O16

Keywords: Credit access; Foreign banks; Africa; Financial inclusion; Information asymmetries

²² This chapter refers to the article cowritten with Florian Léon.

4.1. Introduction

Foreign banks participation has been increasing tremendously during the last decades, especially in emerging countries (Claessens and Van Horen, 2014a). Beyond internationalization, developing countries have witnessed a shift in the ownership structure of foreign banks with the entry of regional foreign banks at the detriment of Western foreign banks, especially after the Global Financial Crisis (Claessens and Van Horen, 2015). Recent studies have shown the importance to consider the home countries of foreign banks to assess their effect on host financial systems, especially in developing economies (Mian, 2006; Van Horen, 2007; Claessens and Van Horen, 2014a). Therefore, studying the phenomenon of regional foreign banks is crucial as research on the subject observes a differentiated impact on host banking systems according to bank ownership.

The literature on foreign banks focuses on their impact on financial stability, banking efficiency or financial inclusion (Claessens and Van Horen, 2014a). In this paper, we focus on financial inclusion, defined as access to formal financial services. Financial inclusion allows people to invest in education, working projects and health and thus can improve development and decrease poverty in an economy (Demirgüç-Kunt and Klapper, 2013; Bruhn and Love, 2014). It also leads to women empowerment (Swamy, 2014). Finally, it brings about financial and banking stability (Han and Melecky, 2013; Ahamed and Mallick, 2017) and increases firms' performance (Beck and Demirgüç-Kunt, 2006; Chauvet and Jacolin, 2017).

Our objective is to test whether foreign banks presence, especially regional banks presence, influences financial inclusion in developing countries. The literature is not conclusive on whether the presence of foreign banks favors financial inclusion. On the one hand, foreign banks presence can be detrimental for financial inclusion if a cream-skimming effect occurs and reduces the global access to credit (Detragiache et al., 2008). Such phenomenon happens if foreign banks cherry pick more profitable and transparent clients, pushing domestic banks to reduce their activities. Indeed, by serving profitable firms, local banks may extract rents that allow them to establish long-term relationships with opaque firms, but such behavior is no longer possible when foreign banks presence increases. Many empirical studies have confirmed predictions made by Detragiache et al. (2008) suggesting that foreign banks focus on more profitable, transparent customers, and such strategy leads to a decrease in banking outreach (Claessens and Van Horen, 2014a; Beck and Martínez Pería, 2010). Some country-specific

studies conclude that foreign banks presence leads to a decline in firms' access to credit (Lin in China, 2011; Gormley in India, 2010).

On the other hand, foreign banks presence can have a positive impact on financial inclusion by increasing global firms' and households' access to credit and bank services (Detragiache et al., 2008). Indeed, even if foreign banks may cherry pick their clients, their presence can still lead to a global increase in banking services thanks to a market segmentation and a discipline of domestic banks. Many studies find an overall positive impact of foreign banks presence on firms' access to credit (Clarke, Cull and Martínez Pería, 2006; Giannetti and Ongena, 2012; Bruno and Hauswald, 2013). Moreover, foreign banks can also increase capital allocation efficiency (Taboada, 2011).

However, existing papers rarely consider the heterogeneity in foreign banks and in particular the specific characteristics of regional foreign banks. Cross-border banks from the same geographical area may benefit from both local and global advantages. As foreign banks, they may develop higher expertise allowing them to be more efficient (Zins and Weill, 2017). As regional cross-border banks, they may know better the environment than non-regional foreign banks. Mian (2006) shows that geographical and cultural proximity between a subsidiary host country and its parent bank home country reduces the informational disadvantages faced by foreign banks. The informational advantage may be particularly important in opaque markets that are more prevalent in developing countries.

This paper aims at studying the phenomenon of regional foreign banks focusing on the African continent. Africa is an excellent testing ground because the issue of informationally difficult borrowers is crucial since a large part of the population does not have neither the official documents required nor sufficient information to contract financial services. As a consequence, the continent is one of the regions with the lowest financial inclusion (Zins and Weill, 2016)²³. In addition, Africa has witnessed a rapid penetration of regional foreign banks

²³ In 2014, only 35 percent of African households owned a formal account, 15.4 percent saved money at a formal financial institution and 6.7 percent contracted a formal credit against respectively 61.5, 27.5 and 10.7 percent worldwide (Zins and Weill, 2016). Regarding firms, the percent of firms with a bank loan is around 22.2 percent and the percent of firms whose recent loan application was rejected is about 15.3 in Sub-Saharan Africa against respectively 33.7 and 11.2 percent worldwide. Firms' access to finance is thus also lower in Africa than in the rest of the world, according to Enterprise Surveys (available at: enterprisesurveys@worldbank.org/data/exploretopics/finance).

over the past fifteen years with the expansion of Pan-African Banks (PABs henceforth) (Beck et al., 2014; Léon, 2016)²⁴.

We investigate the determinants of financial inclusion of households and firms in Africa. For firms, we use the World Bank Enterprise Surveys to check whether foreign banks presence influences firms' access to credit. For households, we use the World Bank Findex Database and study the impact of foreign banks presence on households' bank account ownership, formal saving and formal credit. To assess the presence of foreign banks by type of ownership, we rely on a hand-built database. Our analysis focuses on 33 African countries in 2011 and 2014 for households and on 31 African economies over the 2006-2014 period for firms. In addition to a simple probit model, we employ an instrumental variable approach to overcome potential endogeneity issues.

We find robust evidence of a positive impact of regional foreign banks (PABs) presence on firms' access to credit while a less robust influence is observed for households. We explain this result by the fact that PABs resort more on relationship lending than non-African foreign banks, increasing the number of potential clients. PABs have the global advantages of foreign banks as they have access to higher amounts of capital and technological advances. They also have local advantages as host and home countries of their subsidiaries share higher geographical and cultural proximity. Our extensions give additional information. First, PABs seem to increase trust of households in financial institutions. Second, PABs seem to focus on African middle classes as they increase financial inclusion of more educated African customers. Finally, PABs seem to favour firms' access to credit because they apply less strict procedures rather than by offering better credit conditions.

Our contribution is threefold. First, our analysis adds to the literature linking bank ownership and financial inclusion. Some studies conclude that foreign banks have a detrimental effect on financial inclusion by reducing the global outreach of financial services in the economy (Detragiache et al., 2008; Gormley, 2010, Claessens and Van Horen, 2014a) whereas other studies observe a beneficial impact with a global increase in financial services outreach (Clarke et al., 2006; Giannetti and Ongena, 2012). Some empirical papers show that foreign

²⁴ According to Beck et al. (2014), leading PABs own 15 to 45 percent of the market shares in many African economies. The Togolese Ecobank, the Southern African Standard Bank Group, the Moroccan Banque Marocaine du Commerce Extérieur (BMCE), the Nigerian United Bank for Africa, the Moroccan Attijariwafa Bank, the Moroccan Groupe Banque Centrale Populaire du Maroc (GBCP) and the Southern African Barclays Africa Group are some of the major PABs expanding their activities on the continent.

banks differ in their impact on the host market because of their entry mode (Claeys and Hainz, 2014) and because of their internal organization (De Haas and van Lelyveld, 2010). Foreign banks' heterogeneity must thus be considered to understand the heterogeneous influence they have on host economies. Focusing on Africa gives us the opportunity to study whether the home country of foreign banks matters to assess the influence of foreign banks on host banking systems.

Second, our analysis complements a scant literature on the impact of regional foreign banks in Africa. In some economies, Pan-African banks have been replacing Western foreign banks from developed countries²⁵. A few studies show that PABs, foreign banks from emerging markets and foreign banks from developed countries differ (Pelletier, 2018; Zins and Weill, 2018). Closer to our work is the paper written by Beck (2015). He concludes that the presence of foreign banks from emerging countries is positively related to firms' access to credit in Africa whereas the presence of foreign banks from developed countries is negatively related to firms' access to credit. We extend this work by considering households in addition to firms. Moreover, we distinguish foreign banks from Africa and foreign banks from non-African developing countries. Finally, we present a more robust analysis that allows us to provide a causal relationship rather than refined correlations.

Another contribution of our paper is to focus not only on firms but also on households. To our knowledge, Beck and Brown (2015) propose the only study that focuses on households' access to credit. Studying 17 countries in Eastern Europe, Russia and Turkey, they find evidence of a cherry-picking behaviour on the behalf of foreign banks towards wealthier and formally employed households. However, they do not check whether foreign banks presence decreases households' banking outreach in general. We investigate both issues by checking whether regional banks in Africa focus more on specific customers and by measuring the global impact of regional banks presence on households' financial inclusion.

The paper is organized as follows. Section 2 discusses the hypotheses. Section 3 is dedicated to the description of our data. Section 4 presents the methodologies. Section 5 provides the results. In section 6, we add extensions to further understand our main results. Section 7 concludes.

²⁵ For example, the Moroccan Attijariwafa bank acquired the subsidiaries of the French bank *Crédit Agricole* in five West African countries in 2008.

4.2. Hypotheses

Focusing on credit to the private sector in general, Detragiache et al. (2008) theorize that foreign banks may have an opposite impact on credit.

On the one hand, a large presence of foreign banks can be detrimental for credit if a cream-skimming phenomenon emerges. Foreign banks resort more to hard information such as accounting information, credit history and collateral values since the use of soft information is more complicated and costlier for them. Indeed, building relationship lending requires time and means. To offset this, foreign banks use their skills and technologies to collect information on their clients. They cherry pick their clients and focus on more transparent and profitable ones. By offering innovative products or less expensive services than their domestic counterparts, they can attract more profitable customers. Domestic banks are then left with opaque and riskier clients. A cream-skimming effect occurs if local banks used to employ rents extracted from profitable and transparent firms to establish long-term relationships with opaque and riskier firms. To stay competitive, domestic banks can no longer adopt such behaviour and must reduce their activities with opaque customers. Opaque clients become more credit-constrained as domestic banks reduce their activities. This issue is particularly acute in developing countries because borrowers cannot easily signal their creditworthiness. Indeed, banks' clients in developing countries use more relationship lending with their lenders as they often lack the official documentation. Detragiache et al. (2008) empirically confirm that credit to the private sector is lower in low and lower middle-income countries with a larger presence of foreign banks. Furthermore, foreign banks' loan portfolios are healthier.

Such cream-skimming effect thus worsens the situation of those that cannot overcome information asymmetries without relationship lending and leads to a decline in total credit to the economy as domestic banks lend less.

H1a: Foreign banks presence decreases firms' access to credit and households' financial inclusion in Africa.

On the other hand, a large presence of foreign banks can have a positive impact on access to finance by enhancing the segmentation of the market. According to Detragiache et al. (2008), domestic and foreign banks meet different customers' needs and such repartition increases the access to financial services.

Foreign banks can bring about innovation in the banking system through the introduction of new products and services and thanks to their technological advances. Moreover, they have higher amounts of capital thanks to their easier access to the interbank market and thanks to their internal capital market (De Haas and van Lelyveld, 2010).

In addition, foreign banks presence can discipline other banks in the system through increased competition (Clarke, Cull and Martínez Pería, 2006). To stay competitive, domestic banks must reduce their overheads costs, better monitor their clients and improve their cost efficiency. All of this can lead to a decrease in interest rates and to improvements in the financial services offered to African clients. As a consequence, foreign banks participation decreases barriers to financial inclusion (Beck, Demirgüç-Kunt and Martínez Pería, 2008). Thus, even if foreign banks focus more on large and transparent clients, indirect effects of their presence benefit all customers. Foreign banks presence can thus lead to an overall increase in the offer of financial services.

H1b: Foreign banks presence increases firms' access to credit and households' financial inclusion in Africa.

Only a few papers consider the heterogeneity of foreign banks in terms of home countries. In a path-breaking paper, Mian (2006) highlights the fundamental role distance plays in determining a foreign bank's impact on the host banking system. The more distant a foreign bank's home country is, the more credit-constrained opaque customers are. Foreign banks bear higher costs due to physical, cultural and institutional distance between their home country and the host country. Clients that rely on relationship lending suffer the most from an increase in distant foreign banks. Claessens and Van Horen (2014a) confirm that distance matters to explain the consequences of foreign banks on financial depth. As a consequence, regional foreign banks (PABs) may have an informational advantage against other foreign banks as host and home countries share higher geographical, cultural and legal proximity.

PABs have started their expansion in the mid-2000s through stand-alone subsidiaries in host countries. Starting their spread in the neighbouring countries, major PABs even spread to the entire continent. The parent bank in the home country provides a common framework and an internal capital market. Subsidiaries are integrated in their group but use local labour, local IT functions and local management functions in order to bring about an "indigenization"

process (Beck et al., 2014). Moreover, some empirical works show that PABs differ from non-African foreign banks since they would be less performant when considering ROE and cost-to-income measures (Pelletier, 2017) but more cost efficient (Zins and Weill, 2017). Finally, Nguyen, Perera and Skully (2016) observe that PABs' subsidiaries use more traditional financial intermediation whereas non-African foreign banks use more non-traditional banking. Such different business model may allow PABs to resort more to soft information and relationship lending than non-regional foreign banks. Thus, they can reach more opaque clients than other foreign banks that resort only on hard information, increasing the pool of potential clients.

In addition, Léon (2016) points out that the entry of PABs has increased competition in local markets with potential positive effects on financial services provisions. Moreover, PABs might also increase financial inclusion thanks to a demand-side effect. Indeed, many PABs have adopted aggressive marketing strategy insisting on their proximity with customers due to their African roots. In addition, contrary to local banks, PABs did not suffer from a loss of confidence in banking systems after the crises in the 1980s-1990s. As global and local actors, PABs may increase African customers' confidence in formal banking.

H2: Pan-African banks presence increases firms' access to credit and households' financial inclusion.

4.3. Data and variables

4.3.1. Financial access for individuals and firms

To explore the determinants of individuals' and firms' access to formal finance, we employ two datasets: (i) the World Bank Global Findex; and, (ii) the World Bank Enterprise Surveys.

4.3.1.1. Data on the use of financial services by individuals

Information on access to formal financial services by individuals is obtained from the Global Findex database. The Global Findex database is extracted from surveys covering 143 countries in two waves (2011 and 2014). The surveys were built to be nationally representative and roughly 1,000 adult people in each country have been questioned (for more description, see Demirgüç-Kunt and Klapper, 2013). The Global Findex database provides in-depth data showing how people save, borrow, make payment, and manage risk.

In line with former literature (Allen et al., 2016, Zins and Weill, 2016), we focus on three main measures of financial inclusion: (i) formal account, (ii) formal saving; and, (iii) formal credit. Formal account variable is a dummy equal to one if the respondent has a bank account at a formal financial institution or through a mobile money provider during the survey. Formal saving is a dummy equal to one if the individual saved using an account at a financial institution in the past twelve months. Formal credit equals one if the respondent borrowed from a formal financial institution in the past twelve months.

4.3.1.2. Firms' access to credit

Data on firms' access to formal credit are retrieved from World Bank Enterprise Surveys (ES). An advantage of ES is its coverage of firms of all sizes in many developing countries, contrary to other databases (such as ORBIS). Among other topics, the ES address questions about firms' access to credit.²⁶ To identify access to loans, we refer to two dummy variables commonly employed in the literature (e.g., Beck, 2015).

The first dummy ("*Has a Loan*") is whether a firm has a loan or an overdraft. A drawback of this proxy is that it does not take into account whether the firm needs external finance or not.

We also consider an alternative measure based on credit experience in the year prior to the survey. Following Popov and Udell (2012) and Léon (2015), we classify firms into one of the three groups: (i) firms without a need for credit; (ii) firms that have contracted at least one credit in the past year; and, (iii) firms expressing a need for credit but that have not contracted

²⁶ Unfortunately, we do not have relevant data on use of other financial services (e.g., saving, insurance) by firms.

a credit because they were discouraged to apply or because their demand was turned off. The second dummy (“*Credit Experience*”) takes value one for firms that obtained a loan and zero for firms belonging to the latter group (discouraged borrowers or firms whose credit application was turned down). Firms that did not express a demand for external funds are excluded in the analysis when we consider this variable.²⁷ Unfortunately, the second measure can be computed only for a subset of firms due to the lack of data.

4.3.2. Data on Pan-African banks

We merge our datasets on financial access with a new macro database on the presence of Pan-African banks (PABs) in each country-year. To measure the presence of each ownership type, we developed two measures; the share of total assets held by each type of bank ownership and the amount of each type of bank ownership relative to the total amount of banks in the economy.

To do so, we first built a database containing unconsolidated balance sheets of 230 banks on the continent covering the 2002-2015 period using the Bankscope database issued by Bureau van Dijk. For each bank, we determined the major shareholder every year thanks to the Bankscope database, banks’ annual reports and newspaper releases.

Using this information, we aggregated the share of each ownership type assets to total bank assets for each year in every country. We also aggregated the amount of each ownership type relative to the total amount of banks present in the economy. For example, in our regression the variable *Pan-African banks* is the share of assets held by Pan-African banks to total bank assets in a given country during a specific year.

A bank is considered as foreign when a foreign organization is the first shareholder or when the majority of the shares is controlled by foreign companies. The same definition applies for the other ownership types. Three different kinds of foreign banks coexist in Africa: foreign banks from developed countries, foreign banks from developing countries and Pan-African banks. Furthermore, two domestic banks compete: domestic publicly-owned banks and privately-owned banks. This last category is the benchmark for all our regressions.

²⁷ Details about variable construction can be found in Léon (2015).

In Appendix 4.3., we display main evolutions of bank ownership structure in Africa since 2002. Recent years have been marked by a decline of public banks and foreign banks from developed countries, at the benefit of domestic private banks and foreign banks from developing countries (Africa and elsewhere). Specifically, we show a sharp decline in the share of public banks (from 26% in 2002 to 10% in 2014) and an increase in the market share of domestic private banks by 7 points (from 26% to 33%). The share of assets managed by foreign banks remains stable over the period around 55%. However, we observe a shift in the origins of foreign banks. During the last 15 years, the share of foreign banks from Africa and from other developing countries has raised, at the detriment of foreign banks from developed countries. Foreign banks from developed countries accounted for more than one quarter of total assets in 2002 but only 16 in 2015. Meanwhile, the share of assets managed by PABs has increased by 5 points (from 30% to 35%) and by 3 points for foreign banks from other developing countries (from 0.7% to 3.9%).

4.3.3. Sample

We restrict our sample to African countries (including Northern African countries). We then drop countries for which data on PABs are not available. We also exclude households or firms for which dependent variables were not available and for whom at least one of the control variables was missing.

We apply additional filter rules specific for data on firms extracted from Enterprise Surveys. We remove firms whose size exceeds 1,000 employees or age is above one century. We excluded observations when the interviewer did not believe that the responses were reliable (see, Léon, 2015).

Our final sample includes 54,407 households from 33 African countries (54 surveys) and 22,470 firms from 31 African countries (55 surveys)²⁸.

Descriptive statistics, reported in Table 4.1., indicate that only one third of households have access to a formal account, less than one quarter to formal saving and only 6% to a loan.

²⁸ The number of surveys differs from the number of countries because several surveys are often available for each country. Findex considers five countries for which we do not have information in Enterprise Surveys (Algeria, Ethiopia, Gabon, Rwanda, and Zimbabwe). The ES considers 3 countries not included in Findex (Cape Verde, Eritrea and Mozambique). The 28 remaining countries are included in both ES and Findex (see Appendix for complete list).

The level of financial inclusion for firms is also rather limited as indicated in Table 4.2. One third of firms has a loan or a line of credit. However, our second measure of firms' access to credit (that account for demand) indicates that less than one fifth of firms with a need for credit received a loan in Africa.

4.4. Methodology

4.4.1. Baseline specification

The aim of this paper is to evaluate the impact of foreign banks, especially PABs, on access to financial services by individuals and firms. Given the binary nature of our dependent variables, a binary model is better suited than a linear model.²⁹ We run the following probit regression to investigate the impact of foreign banks presence:

$$Prob(Y_{ij} = 1) = \Phi(\alpha + \beta_1 PABS_j + \beta_2 nonAfricanFor_Ding_j + \beta_3 For_Ded_j + \delta Public_j + \Gamma X_i + \Upsilon C_j) \quad (1)$$

Where subscript i refers to individuals or firms and subscript j to country³⁰ and $\Phi(\cdot)$ is the standard normal cumulative distribution. Y_{ij} is the dependent variable and equals one if the individual/firm i in country j has access to financial services and 0 otherwise. As explained above, we consider five different dependent variables, namely formal account, formal saving and formal credit for individuals and the two measures of credit availability for firms.

Our variable of interest is $PABS_j$ that captures the presence of regional foreign banks (Pan-African Banks) in country j . We also include a measure of the presence of banks from non-African developing countries ($nonAfricanFor_Ding_j$) and from developed countries (For_Ded_j). We also consider a measure of the presence of state-owned banks extracted from our dataset ($Public_j$). The omitted category is domestic privately-owned banks. In the baseline model, we consider the share of assets held by foreign and public banks. As a robustness check,

²⁹ We run a linear model and results are similar to those obtained using probit both in terms of statistical and economical significance.

³⁰ For sake of brevity, we employ the term country, but we refer to survey (or country-year) because some countries have several surveys.

we compute the number of foreign banks to total banks. Foreign banks presence favors financial inclusion if $\beta_1 > 0$.

We add two sets of control variables. First, a set of individual variables (X_i) is added to capture characteristics of individuals (when we consider individuals' use of financial services) or firms (when we consider firms' access to credit). To select relevant variables, we follow previous literature (e.g., Allen et al., 2016, Zins and Weill, 2016 for individuals; and, Beck, 2015; Léon, 2015 for firms). For individuals, we include a gender dummy, the age in quadratic form, the level of income, and the level of education (secondary and tertiary). For firms, we consider size (captured by the number of employees in log), age (in log), ownership type (foreign-owned, local-private owned, and state-owned which is the omitted variable), organizational type (privately held and sole proprietorship) and 16 different sectoral dummy variables.

Second, to improve identification and to control for possible confounding factors, we consider different country-level variables (C_j). The presence of foreign banks as well as financial inclusion can be shaped by country characteristics such as the level of income, financial development or macroeconomic instability. To control for these factors, we add three country-level variables (extracted from the WDI): the ratio of domestic credit to the private sector over GDP, the level of GDP per capita (in log) and the inflation rate. Details about variable definition can be found in Appendix 4.2.

As it is usual in probit model, we report marginal effects instead of coefficients to gauge not only the statistical significance but also economic significance. In addition, as our explanatory variables only vary on the country-level and to take into account omitted country-level effect, we cluster errors at the country-level (Cameron and Miller, 2015).

4.4.2. Instrumental variable approach

A crucial issue concerns the identification of the impact of PABs presence on financial inclusion for individuals and firms. Despite the inclusion of country-level control variables, omitted variables or unobserved shocks may explain both the penetration of PABs and differences in financial inclusion. The direction of bias is theoretically unknown. On the one hand, PABs may locate in countries with a limited provision of financial services and weak

competition to earn large profit. On the other hand, PABs may prefer to follow their clients and are more willing to locate in dynamic markets. The limited number of studies on the drivers of cross-border bank expansion in developing countries (Claessens and Van Horen, 2014b; Kodongo et al., 2015; Van Horen, 2007) does not allow us to conclude on the most likely hypothesis. Nonetheless, to overcome the endogeneity issue, we apply an instrumental variable approach.

A challenge in instrumental approach consists in selecting relevant instruments that sufficiently explain the presence of PABs (strong instrument) but without affecting directly financial inclusion (exclusion restriction). To select relevant instruments, we focus on proximity between home countries and host country. Claessens and Van Horen (2014b) point out that proximity between host and home country is a major driver of cross-border bank expansion, especially for developing countries³¹.

To build instruments, we first select PABs' countries of origin. Indeed, PABs identified in our database are originated from many countries. However, only a handful of home countries accounts for a large share of PABs. Specifically, we consider the following home countries: Nigeria, Kenya, Togo, South Africa, Mali (until 2008) and Morocco (after 2008). Nigeria, Kenya and South Africa are regional banking centers and many PABs originate from these countries. Togo is the home country of Ecobank, the largest PAB in Africa. Until 2009, Bank of Africa, one of the leading PABs, was owned by Malians. In 2010, a Moroccan bank, namely BMCE Bank, became the major shareholder of Bank of Africa. Meanwhile, other major Moroccan banks, especially Attijariwafa bank and Banque populaire, have begun to invest in Africa since 2008. Considering Morocco as a regional financial center seems relevant but only after 2008. At the same time, Mali, Bank of Africa's home country, lost its predominance in the end of 2000s.

We select measures of geographical and economic proximity. First, we consider geographical distance between home and host countries, as Popov and Udell (2012). Specifically, for each host country j , we compute the Euclidian distance from (economic) capital city in country j to (economic) capital city in all home countries k . We then employ the mean distance between country j and home countries.

³¹ As usual in bilateral flows, three factors may motivate the implantation of PABs from country k in a country j : (i) push factors, i.e. characteristics of country k ; (ii) pull factors, i.e. characteristics of country j ; and, (iii) proximity between country j and country k .

We also consider a measure of economic integration between home and host countries. To do so, we compute the share of imports and exports with the five home countries for each country j to GDP (equivalent to openness ratio but only with these countries)³². Economic integration allows us to capture other sources of proximity between two countries above pure geographical distance. For instance, two countries may have a long-term relationship due to history or cultural elements (e.g., common language, common law system), despite long distance between them.

We expect that geographical distance and economic exchanges are closely related to the presence of PABs. The evidence suggests that both geographical and economic proximities matter in explaining foreign banks' location decisions, especially in developing countries (Claessens and Van Horen, 2014a, 2014b; Van Horen, 2007). Meanwhile, we believe that both proxies are not directly related to financial inclusion in country j . There is no reason to believe that average distance between country j and home countries could affect financial inclusion, except through PABs presence. The argument is perhaps less straightforward for economic integration. One might argue that an expansion in host country could spur trade between host and home countries. At the same time, economic expansion may stimulate access to financial services. There is, however, no reason to believe that growth episode in one host country may induce a disproportionate impact on trade with home countries. In the robustness check, we will document that our instrumental strategy is robust to change in our set of instruments.

We employ both linear (2SLS) estimator and non-linear estimator (probit model with instrumentation). The linear model allows us to compute diagnosis tests associated with instrumentation. In probit model, we compute and report marginal effects. Standard errors are clustered at the country level to account for autocorrelation within country in all models.

³² The instrument is computed as follows for country j : $OPEN_{jt} = \sum_j \frac{(X_{jkt} + M_{jkt})/2}{GDP_{it}}$, where X_{jkt} refers to imports, M_{jkt} to exports, j to host country, k to home country (see the list in the text) and t to the period. Data are extracted from DOTS data from the IMF.

4.5. Results

4.5.1. *The impact of PABs presence on financial inclusion of individuals*

4.5.1.1. *Baseline model*

Table 4.3. displays the results of the probit estimations for the main indicators of financial inclusion. We consider three dependent variables, namely the use of formal account in the first three columns (1-3), the use of formal saving in columns (4-6) and the use of formal credit in the last three columns (7-9). We first consider overall foreign banks presence without considering banks' origins. We then distinguish foreign banks from developing countries and foreign banks from developed countries. We finally consider PABs, foreign banks from other developing countries and foreign banks from developed countries.

Results indicate that foreign banks presence does not have a significant statistical effect on individuals' use of financial services, irrespective of the services considered (account, saving, or credit). This finding is in line with Allen et al. (2016). When we distinguish foreign banks according to their origin, we fail to provide significant impact on financial services usage. In particular, the use of formal account, saving, or credit does not increase in countries with a larger share of PABs. Results indicate that foreign banks from developed countries do not affect the use of formal financial services while non-African foreign banks from developing countries seem to affect negatively formal saving and formal credit.

Turning to control variables, we show that public banks do not affect individuals' financial inclusion. Individuals located in the most economically and financially developed countries are more likely to use formal financial services, as expected. All individuals' characteristics have a significant relation with financial inclusion. Findings, in line with Zins and Weill (2016), indicate that male, more educated and wealthier individuals are more likely to have access to a formal account, to save in a formal institution, and to get a credit from a formal institution. Age has an inverted U-shaped relation with the three indicators.

4.5.1.2. *Instrumental variable approach*

A major issue with previous results is the endogeneity problem. In particular, we might expect that the absence of impact of PABs on financial inclusion could be explained by non-

random location of PABs. To overcome this problem, we run an instrumental variable model. Formally, we estimate the effect of PABs using geographical distance and the share of trade between host and home countries as external instruments. We report both linear model (2SLS) and probit model with instruments (IV-Probit) for the three dependent variables (formal account, formal saving and formal credit).

Before commenting the results, displayed in Table 4.4., we gauge the validity of our instrumentation strategy through different diagnostic tests³³. First, we investigate whether our instruments are strong, i.e. correlated with the endogenous variable. To do so, we refer to the first stage F-statistic of excluded instruments. Stock and Yogo (2005) calculate critical values for the weak instrument test. Using linear estimation (2SLS), we report the Kleibergen-Paap Wald rank F-statistic (F-1st stage in Table 4.4.) because errors are clustered at the country-level. Unfortunately, the Kleibergen-Paap Wald rank F-statistic cannot be directly compared to Stock-Yogo's tabulated values because Stock and Yogo require the i.i.d assumption (that it is not the case here)³⁴. Nonetheless, F-statistics reported at the bottom of the table are below critical values tabulated by Stock and Yogo. Put differently, our instrumentation is potentially subject to weak instrument issue.

Second, our IV strategy is valid if instruments respect the exclusion restriction. Put differently, the error term of the second stage should be orthogonal to the excluded instruments. To test this hypothesis, we run an over-identification test. Under the null hypothesis, instruments are orthogonal to the error term and therefore respect the exclusion restriction. In Table 4.4., we do not reject the null hypothesis, indicating that our instruments seem to be exogenous as expected.

Finally, tests of exogeneity (Hausman-type test in linear model and Wald test in probit model) compare instrumented model and non-instrumented model. Under the null hypothesis, both models provide similar results. We reject the null hypothesis in our case for *Formal*

³³ Diagnostic tests are produced using linear specification. To our knowledge, there are not similar tests in a non-linear context.

³⁴ However, conclusion is not so clear-cut. Insofar as we reject i.i.d assumption, we report Kleibergen-Paap Wald rank F statistic instead of Cragg-Donald F-statistic. The usual Cragg-Donald F-statistic is valid for models assuming i.i.d. However, critical values tabulated by Stock and Yogo (2005) are for models with i.i.d and therefore for the Cragg-Donald F-statistic. It should be noted that, in our case, Cragg-Donald F-statistics are larger than tabulated values by Stock and Yogo (2005).

Account and Formal Saving, and therefore confirm the importance to control for endogeneity. However, we do not reject the null hypothesis for *Formal Credit*.

Results using instrumentation differ from previous findings reported in Table 4.3. In particular, PABs presence positively affects the use of financial services by individuals, irrespective of financial services considered. Foreign banks from developed countries have also a positive and statistically significant impact on financial inclusion, whereas foreign banks from non-African developing countries do not have any significant impact. PABs have not only a statistical impact but also an economic effect on financial inclusion. Let's consider an increase of 25% in market share of assets held by PABs (e.g., as experienced by Côte d'Ivoire between 2009 and 2016). The likelihood to get access to a formal account, formal saving or formal credit will raise by 6.75, 5, and 1.25 percentage points, respectively. To get a sense, each variation represents about one fifth of average probability to have a formal account, saving or credit³⁵.

The positive impact of PABs can be explained by their informational advantage and the positive impact of foreign banks from developed countries by their technological advantage. However, banks from other developing countries are certainly less performant than local banks and PABs in terms of knowledge of local customers and environment, and less effective than global banks from Europe from a technological point of view, as argued by Zins and Weill (2017). Our results validate the H1b hypothesis: foreign banks presence increases households' financial inclusion in Africa except for foreign banks from non-African countries that have no impact. The findings also validate the H2 hypothesis: PABs presence increases households' access to financial services on the continent.

4.5.2. The impact of PABs presence on firms' access to finance

4.5.2.1. Baseline model

Table 4.5. displays results on the relationship between foreign banks penetration and firms' access to credit. Access to credit by firms is measured in two ways. The first dummy equals one if a firm has a loan or an overdraft and 0 otherwise. The second measure considers

³⁵ To compute magnitude, we refer to results from IV probit. For example, for formal account the estimated coefficient ($\hat{\beta}$) equals 0.27. We multiply this coefficient by 0.25 (an increase of 25%) that gets 0.065. The average probability to have access to formal account is 0.322, so $0.065/0.322=0.209$. We do the same for formal saving and formal credit and we obtain respectively 0.217 and 0.189.

credit experience of a firm in the year prior to the survey. The dummy equals one if a firm obtained a loan and 0 if a firm with a need for external funds did not obtain one due to discouragement or loan denial by banks. Results using the first dummy are reported in columns (1-3) and those using the second dummy in columns (4-6). As previously, we run the three different models presented in equations. 1, 2, and 3.

Econometric results are consistent in different specifications, irrespective of the measure of firms' access to credit considered. We document that the presence of foreign banks alleviates credit constraints faced by African firms, as shown in columns (1) and (4). However, the positive effect of foreign banks presence is driven by PABs, while foreign banks from developed countries and from non-African developing countries have no impact on firms' credit access. These results are in line with those obtained by Beck (2015). The impact of PABs presence on firms' access to credit is also economically noticeable, especially when we consider credit experience. A 25% increase in the share of assets held by PABs will raise the likelihood to get a credit by 4%. Even if this increase seems moderate, one should recall that the average access to credit is below 20%. To obtain a similar impact, credit to GDP should increase by almost 15 percentage points.

Control variables indicate that public banks and inflation are detrimental for firms' access to formal loans, even if results are not always statistically significant. As expected, the level of financial development has a positive impact on credit access by firms. Findings regarding firm-level control variables are in line with previous studies (e.g., Beck, 2015; Léon, 2015). Larger and older firms are less credit-constrained, contrary to partnership and sole proprietorship firms.

4.5.2.2. Instrumental variable approach

As previously, one might raise concerns about endogeneity issue insofar as PABs location and expansion is not random. We therefore employ an instrumental variable model and results are displayed in Table 4.6. Before discussing the results, we start by evaluating our instrumental strategy using diagnostic tests at the bottom of the Table. As previously, our instruments do not seem to suffer from endogeneity issue, according to the overidentification tests. In addition, while in the previous model we face a risk of weak instrument, it is not the case here. F-statistic is above critical thresholds (values tabulated by Stock and Yogo, 2005)

and therefore can be considered as not weak³⁶. Finally, the exogeneity tests reveal that the instrumented model using credit experience as dependent variable provides different results than non-instrumented model (both models provide similar findings when we consider the use of loan). In a word, diagnostic tests valid our instrumental strategy (or at least do not reject it) and show the importance to consider endogeneity in our study.

Turning to econometric results, IV estimations are in line with our previous findings (Table 4.5.). The presence of PABs has a positive impact on firms' access to credit. Nonetheless, the economic impact of PABs is increased between 50% and 100% when we instrument our variable of interest. According to the same example than previously, if PABs increase their market share by 25%, the likelihood to get access to credit will increase from 6% to 7.5%. The attenuation bias observed suggests that banks from African countries locate in priority in countries with a limited access to financial services. This is in line with results using individuals' use of financial services reported above and with previous findings (Claessens and Van Horen, 2014a, 2014b). We thus validate the H2 hypothesis: PABs presence increases firms' access to credit.

4.5.3. Robustness checks

We run a battery of sensitivity tests to gauge the stability of our results. All results are reported in Table 4.7. (the row (0) displays baseline results reported in Tables 4.4. and 4.6.).

First, we replace the share of assets held by PABs, foreign banks from developed countries and foreign banks from developing countries by the number of banks of each group to the total number of banks in row (1). It does not affect our conclusion.

Second, we run regressions on sub-samples. We exclude countries from North Africa. Furthermore, since Findex and ES have multiple waves, we keep only data from the last survey for each country. Then, we consider 28 countries for which we have data on individuals' access to financial services from Findex and data on firms' access to credit from ES. Finally, we exclude countries for which Bankscope reported data for less than 5 banks per country (our

³⁶ See above for a discussion on F-statistic. Once again, when we compute Cragg-Donald F-statistic instead of Kleibergen-Paap Wald rank F statistic, values are larger than critical values tabulated by Stock and Yogo (2005).

sample is reduced to 20 countries for individuals and 17 for firms in this case). Our findings are often confirmed as shown in columns (2) to (5).

Third, we add several country-level control variables to account for omitted bias. In particular, we consider GDP growth for economic growth as both financial inclusion and PABs' development could be driven by rapid growth episodes. We also consider the structure of population (population density and the share of urban population) as financial inclusion is reduced in rural areas (Allen et al., 2012). In addition, credit information sharing mechanisms and creditors' rights, the degree of competition and regulation, and the level of efficiency in banking systems are potentially correlated with PABs' development (Léon, 2016; Zins and Weill, 2017; Pelletier, 2018) and with access to financial services (Allen et al., 2012; Léon, 2015). We therefore include the credit information index and creditors' rights index provided by Doing Business. As a measure of competition, we consider the share of the three largest banks and the Boone indicator, both reported in the Global Financial Development Database (GFDD). We also include an index of entry restriction built from dataset provided by Barth, Caprio and Levine (2013). The degree of efficiency is captured through different measures extracted from GFDD, namely the net interest margin, the interest spread and the ratio of overhead costs. We finally consider institutional variables from World Governance Index (synthetic indicator and control of corruption) and education level using the primary and secondary school enrolment reported in the WDI. Results, displayed in rows (6) to (20), show that the impact of PABs on firms' access to credit is unaffected by the inclusion of additional control variables. However, results for individuals' access to finance are less robust.

The last battery of sensitivity tests focuses on our instrumental strategy. First, we follow advice from Murray (2006) to gauge our instrumentation strategy by changing our set of instruments. We consider each instrument alone. We also consider the minimum of distance instead of the mean and the logarithm of distance. Finally, one might argue that our second instrument (trade with origin countries) is subject to endogeneity. If a country j experienced economic improvements, trade (with origin countries) may be stimulated, as well as financial inclusion. To control for this issue, we apply two additional tests. First, we add the trade openness ratio (defined as the average of total imports and total exports divided by GDP) as control variable. Second, we use as instrument the ratio of trade with origin countries to total

trade (Share) instead of the ratio of trade with origin countries to total GDP³⁷. This instrument is less subject to correlation with unobserved factors that could affect both trade and financial inclusion. Econometric results displayed in rows (21) to (26) confirm that the effect of PABs on firms' access to credit is strongly robust, and less robust for individuals.

To sum up, our analysis documents that the penetration of PABs has a robust, positive impact on firms' access to credit. While some of our econometric work suggests a positive impact for individuals' access to financial services, our findings are less clear-cut and we are unable to provide a clear conclusion.

4.6. Extensions

In this part, our objective is to find some clue explaining how PABs affect financial inclusion. We first study households and then firms.

4.6.1. Households' access to financial services

To better understand how PABs presence affects households' financial inclusion, we launch two additional extensions. First, we realize interactions to check whether PABs presence differently affects households. We interact PABs with gender, age, income and education. We launch first a simple probit equation and second an instrumental variable approach. Our results show that PABs have a significant positive impact on tertiary education and a less robust impact on secondary education³⁸. PABs presence would thus benefit households that are more educated.

Second, we study the impact of PABs on households' barriers to financial inclusion. In the Findex database, people were asked to answer yes or no to the following question: "Please tell me whether each of the following is a reason why you, personally, do not have an account

³⁷ The instrument is computed as follows for country j : $SHARE_{jt} = \sum_j (X_{jkt} + M_{jkt}) / \sum_j (X_{jlt} + M_{jlt})$, where X_{jkt} (resp. X_{jlt}) refers to imports from country j to country k (resp. l), M_{jkt} (resp. M_{jlt}) to exports from j to k (resp. l), j to host country, k to home country (see the list in the text), l all African countries and t to the period.

³⁸ Tables are not inserted for consistency but can be obtained on request. We do not provide any evidence of a differential impact for other variables (gender, age, and income).

at a bank or another type of formal financial institution". We separate the answers into three categories. The first category are involuntary barriers due to the bank and is a dummy equal to one when the respondent claimed that the following issues were barriers to financial inclusion: the bank is too far away, financial services are too expensive and/or the documentation required is problematic. The second category are involuntary barriers due to the household and is a dummy equal to one when the respondent claimed that the following barriers prevented him from being financially included: people lack sufficient money and/or cannot get financial services. Finally, the third category is lack of trust in banks and is a dummy equal to one when the respondent answered that he does not have an account at a financial institution because he does not trust banks. We use the same methodology as previously with barriers as dependent variables. Simple probit is used in the first equation, linear instrumental model approach in the second equation, and instrumental variable approach with probit in the third equation. The same tests for instrumentation are given.

Table 4.8. gives the results for barriers to financial inclusion. First, results for involuntary barriers due to the bank are not significant for PABs. PABs would not propose less expensive financial services, would not reduce distances between customers and agencies and would not require less documentation than domestic private banks. Second, results for involuntary barriers due to the household show a significant positive impact of PABs in two equations. People who do not have enough money to get financial services would suffer more from this barrier to financial inclusion when PABs presence increases in the banking system. Third, Pan-African banks have a significant negative impact on the barrier lack of trust in banks. People tend to trust more financial institutions in economies where the presence of PABs is higher.

We can interpret our results from interactions and barriers for households with the fact that PABs may target African middle classes. Indeed, PABs presence increases the probability of being financially excluded because of a lack of money but increases the probability of being included for more educated people. Such result needs more work on services offered by these banks. Our results also tend to show a demand-effect on financial inclusion through trust. People tend to trust more banks when PABs presence is higher in the economy. Combining aspects of global and local actors, PABs may be recognized as efficient intermediaries by African customers. Moreover, their aggressive communication strategy on the continent might

also help building such climate of trust. These intuitions need however further work to better understand the feeling customers have towards PABs.

4.6.2. Firms' access to credit

In the previous sub-section, we highlight that PABs seem to favor middle classes. We then investigate whether the presence of PABs disproportionately influences access to credit for informationally opaque firms. To do so, we interact the development of PABs with different measures of firms' opacity. As it is common in the literature (e.g., Beck, 2015), we consider size, age and the fact of being audited as indicators of one firm's transparency. Our results³⁹ indicate that PABs do not favor opaque firms. In particular, the interactions with age and size are never statistically significant. When we consider the interaction between a dummy for audited firms and PABs, we point out that PABs tend to favor audited firms. In other words, our results suggest that PABs do not target specifically opaque firms. This finding is in line with those obtained by Beck (2015). He documents that the marginal impact of foreign banks from developing countries is almost the same in sub-samples of firms considering their size or their age.

In a second step, we then provide some indicative information on how PABs stimulate firms' use of credit. The limited level of credit availability can be explained by two main reasons (Léon, 2015): (i) firm's decision not to apply for a loan; and (ii) bank's decision to turn down the application. We scrutinize this question by investigating whether the presence of regional foreign banks influences firms' decision to apply and/or banks' decision to approve. To do so, we firstly create a variable equal to one for firms asking for a loan and 0 for firms with a need for funds but discouraged to apply. We then focus on applicants and study bank's final decision. Results reported in Table 4.9. columns 1 to 4 show that the presence of PABs influences both firm's decision to apply for a loan and bank's decision to approve. Finally, we focus on discouraged borrowers. An unresolved question is which obstacle matters the most. In the ES, firms that did not apply should provide a reason. Unfortunately, the range of possible answers is more limited than in the Findex. We have only information on barriers due to supply of credit. Nonetheless, we consider two types of obstacles: those related to credit conditions

³⁹ For sake of brevity, we do not report econometric results (available upon request). As previously with households, we consider both non-instrumented and instrumented probit models.

(loan amount, interest rates, maturity) and those related to complex procedures. We then create a dummy for each of these obstacles equal to one if a firm declares that this obstacle justifies its decision not to apply. Interestingly, we point out in columns 5 to 8 that the presence of PABs does not seem to play a role on credit conditions, in line with results provided in sub-section 4.6.1 for households. But more firms apply for a loan in countries with more regional foreign banks because procedures are less complex.

PABs presence does not increase financial inclusion through less expensive financial services than other banks. Resorting more to relationship lending, they seem to require less strict procedures as they develop linkages with their corporate and private customers.

4.7. Conclusion

This study analyses the impact of foreign banks presence and of its heterogeneity on financial inclusion in Africa. We find a positive impact of regional foreign banks (Pan-African banks) on firms' access to credit. PABs presence in a banking system increases the access to credit of firms in Africa. The result is less clear-cut for households. PABs seem to increase households' access to financial services but the results are less robust than for firms. Our main explanation lies in regional foreign banks double advantages. PABs benefit from technological advantages as they developed the expertise and the global framework of foreign banks. They also benefit from local advantages as they use local management and labour and benefit from higher proximity between their home and host countries. Local advantages allow them to resort more to relationship lending than other non-African foreign banks.

Our results show the importance of taking into account the heterogeneity of foreign banks, especially in developing countries where new actors are expanding their activities and compete with well-established foreign banks from developed countries.

Our findings also demonstrate that foreign banks emerging from the same continent can benefit from local and global advantages to increase financial inclusion. They suffer less than their non-regional counterparts from geographical, institutional and cultural differences between home and host countries. They thus face less problems in understanding clients and developing relationship lending. Relationship lending and soft information are of prime interest

in developing countries where firms and households often lack the official documentation or do not have enough collateral to contract financial services.

Improving the development of PABs leads to higher financial inclusion. However, a massive uncontrolled increased financial inclusion should be taken with cautious. Indeed, in order to create sustainable, reliable financial systems, inclusion of firms and households must be done guaranteeing financial stability. If banks grant too many financial services without sufficient monitoring, such behaviour can be detrimental for the economic system. An important trade-off must be done between risk and credit offer. Regulatory authorities play a key role as they must put in place a framework guaranteeing stability and financial inclusion by enforcing prudential rules.

References

- Ahamed, M.M., Mallick, S.K., 2017. Is Financial Inclusion Good for Bank Stability? International Evidence. *Journal of Economic Behavior and Organization*.
- Allen, F., Demirgüç-Kunt, A., Klapper, L. and Martínez Pería, M.S., 2016. The Foundations of Financial Inclusion: Understanding Ownership and Use of Formal Accounts. *Journal of Financial Intermediation* 27, 1-30.
- Barth, J.R., Caprio, G.J., Levine, R., 2013. Bank Regulation and Supervision in 180 Countries from 1999 to 2011. *Journal of Financial Economic Policy*, 5 (2), 111-219.
- Beck, T., 2015. Cross-Border Banking and Financial Deepening: The African Experience. *Journal of African Economies* 24 (AERC Supplement 1), i32-i45.
- Beck, T., Brown, M., 2015. Foreign Bank Ownership and Household Credit. *Journal of Financial Intermediation* 24, 466–486.
- Beck, T., Demirgüç-Kunt, A., 2006. Small and Medium-Size Enterprises: Access to Finance as a Growth Constraint. *Journal of Banking and Finance*, 30(11), 2931-2943.
- Beck, T., Demirgüç-Kunt, A., Martínez Pería, M.S.M., 2008. Banking Services for Everyone? Barriers to Bank Access and Use around the World. *The World Bank Economic Review* 22, 397–430.
- Beck, T., Fuchs, M., Singer, D., Witte, M., 2014. Making Cross-Border Banking Work for Africa. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and International Bank for Reconstruction and Development / The World Bank.
- Beck, T., Ioannidou, V., Schäfer, L., 2017. Foreigners vs. Natives: Bank Lending Technologies and Loan Pricing. *Management Science*.
- Beck, T., Martínez Pería, M.S., 2010. Foreign Bank Participation and Outreach: Evidence from Mexico. *Journal of Financial Intermediation* 19, 52–73.
- Bruhn, M., Love, I., 2014. The Real Impact of Improved Access to Finance: Evidence from Mexico. *The Journal of Finance* 3, 1347–1376.
- Bruno, V., Hauswald, R., 2013. The Real Effect of Foreign Banks. *Review of Finance* 18(5), 1683-1716.
- Cameron, A.C. and Miller, D.L., 2015. A Practitioner’s Guide to Cluster-Robust Inference. *Journal of Human Resources* 50(2), 317-372.
- Chauvet, L., Jacolin, L., 2017. Financial Inclusion, Bank Concentration, and Firm Performance. *World Development* 97, 1–13.

- Claessens, S., Van Horen, N., 2012. Being a Foreigner Among Domestic Banks: Asset or Liability? *Journal of Banking and Finance* 36, 1276–1290.
- Claessens, S. and Van Horen, N. 2014a. Foreign Banks: Trends and Impact. *Journal of Money, Credit and Banking* 46(1), 295-326.
- Claessens, S. and Van Horen, N., 2014b. Location Decisions of Foreign Banks and Competitor Remoteness. *Journal of Money, Credit and Banking* 46(1), 145-170.
- Claessens, S. and Van Horen, N., 2015. The Impact of the Global Financial Crisis on Banking Globalization. *IMF Economic Review* 63(4), 898-918.
- Claeys, S., Hainz, C., 2014. Modes of Foreign Bank Entry and Effects on Lending Rates: Theory and Evidence. *Journal of Comparative Economics* 42, 160–177.
- Clarke, G.R.G., Cull, R., Martínez Pería, M.S., 2006. Foreign Bank Participation and Access to Credit Across Firms in Developing Countries. *Journal of Comparative Economics* 34, 774–795.
- De Haas, R., van Lelyveld, I., 2010. Internal Capital Markets and Lending by Multinational Bank Subsidiaries. *Journal of Financial Intermediation* 19 1–25.
- Demirgüç-Kunt, A. and Klapper, L., 2013. Measuring Financial Inclusion: Explaining Variation in Use of Financial Services Across and Within Countries. *Brookings Papers on Economic Activity*, 279-321.
- Detragiache, E., Tressel, T., Gupta, P., 2008. Foreign Banks in Poor Countries: Theory and Evidence. *The Journal of Finance* 63, 2123–2160.
- Fisman, R., Paravisini, D., Vig, V., 2017. Cultural Proximity and Loan Outcomes. *American Economic Review* 107, 457–492.
- Giannetti, M., Ongena, S., 2012. “Lending by Example”: Direct and Indirect Effects of Foreign Banks in Emerging Markets. *Journal of International Economics* 86, 167–180.
- Gormley, T.A., 2010. The Impact of Foreign Bank Entry in Emerging Markets: Evidence from India. *Journal of Financial Intermediation* 19, 26–51.
- Han, R., Melecky, M., 2013. Financial Inclusion for Financial Stability. Access to Bank Deposits and the Growth of Deposits in the Global Financial Crisis (Policy Research Working Paper No. 6577). The World Bank, Washington, DC.
- Kodongo, O., Natto, D. and Biepke, N., 2015. Explaining Cross-Border Expansion in East Africa. *Journal of International Financial Markets, Institutions & Money* 36, 71-84.
- Léon, F., 2015. Does Bank Competition Alleviate Credit Constraints in Developing Countries? *Journal of Banking and Finance* 57, 130-142.

- Léon, F., 2016. Does the Expansion of Regional Cross-Border Affect Competition in Africa? Indirect Evidence. *Research in International Business and Finance* 37, 66-77.
- Lin, H., 2011. Foreign Bank Entry and Firms' Access to Bank Credit: Evidence from China. *Journal of Banking and Finance* 35, 1000–1010.
- Mian, A., 2006. Distance Constraints: The Limits of Foreign Lending in Poor Economies. *The Journal of Finance* 61, 1465–1505.
- Murray, M.P., 2006. Avoiding Invalid Instruments and Coping with Weak Instruments. *Journal of Economic Perspectives* 20(4), 111-132.
- Nguyen, M., Perera, S., Skully, M., 2016. Bank Market Power, Ownership, Regional Presence and Revenue Diversification: Evidence from Africa. *Emerging Markets Review* 27, 36–62.
- Pelletier, A., 2018. Performance of Foreign Banks in Developing Countries: Evidence from Sub-Saharan African Banking Markets. *Journal of Banking and Finance* 88, 292-311.
- Popov, A. and Udell, G., 2012. Cross-Border Banking, Credit Access, and the Financial Crisis. *Journal of International Economics* 87, 147-161.
- Stock, J.H., and Yogo, M., 2005. Testing for Weak Instruments in Linear IV Regression. Chapter 5 in Stock, J.H. and Andrews, D.W.K (eds), *Identification and Inference for Econometric Models: Essays in Honor of Thomas J. Rothenberg*, Cambridge University Press.
- Swamy, V., 2014. Financial Inclusion, Gender Dimension, and Economic Impact on Poor Households. *World Development* 56, 1–15.
- Taboada, A.G., 2011. The Impact of Changes in Bank Ownership Structure on the Allocation of Capital: International Evidence. *Journal of Banking and Finance* 35, 2528–2543.
- Van Horen, N., 2007. Foreign Banks in Developing Countries: Origin Matters. *Emerging Markets Review* 8, 81-105.
- Zins, A. and Weill, L., 2016. The Determinants of Financial Inclusion in Africa. *Review of Development Finance* 6, 46-57.
- Zins, A. and Weill, L., 2017. Do Pan-African Banks Have the Best of Both Worlds? LaRGE Working Paper, 2017-05.

Tables

Table 4.1. Summary statistics, households' financial inclusion

Variable name	Obs	Mean	Std Dev	Min	Max
Formal Account	54,047	0.321	0.467	0	1
Formal Saving	36,469	0.234	0.423	0	1
Formal Credit	53,825	0.066	0.248	0	1
Female	54,047	0.491	0.500	0	1
Age	54,047	34.992	15.238	15	99
Income - Poorest 20%	54,047	0.158	0.364	0	1
Income - Second 20%	54,047	0.170	0.376	0	1
Income - Fourth 20%	54,047	0.186	0.389	0	1
Income - Third 20%	54,047	0.214	0.410	0	1
Secondary Education	54,047	0.446	0.497	0	1
Tertiary Education	54,047	0.052	0.223	0	1
Foreign Banks	54	0.632	0.358	0	1
Foreign Banks from Developed Countries	54	0.169	0.180	0	0.563
Foreign Banks from Developing Countries	54	0.463	0.359	0	1
- <i>Pan-African Banks</i>	54	0.430	0.381	0	1
- <i>Foreign Banks from non-African Countries</i>	54	0.033	0.105	0	0.625
Domestic Public Banks	54	0.087	0.202	0	1
Domestic Credit to Private Sector (%)	54	28.94	30.03	4.36	150.87
GDP per Capita	54	1632.7	2.7	328.8	9508.1
Inflation (%)	54	6.33	6.63	-1.09	36.91

Table 4.2. Summary statistics, firms' access to credit

Variable name	Obs	Mean	Std Dev	Min	Max
Has a Loan	21,825	0.364	0.481	0	1
Credit Experience	11,400	0.197	0.398	0	1
Size	22,470	44.346	100.417	0	1000
Age	22,470	16.918	13.015	0	100
Domestic-Owned	22,470	0.885	0.319	0	1
Foreign-Owned	22,470	0.110	0.313	0	1
Partnership	22,470	0.191	0.393	0	1
Sole Proprietorship	22,470	0.521	0.500	0	1
Foreign Banks	55	0.616	0.366	0	1
Foreign Banks from Developed Countries	55	0.215	0.239	0	0.842
Foreign Banks from Developing Countries	55	0.401	0.363	0	1
- <i>Pan-African Banks</i>	55	0.387	0.372	0	1
- <i>Foreign Banks from non-African Countries</i>	55	0.014	0.051	0	0.316
Domestic Public Banks	55	0.125	0.240	0	1
Domestic Credit to Private Sector (%)	55	23.66	25.24	1.2	156.98
GDP per Capita	55	1172.9	2.5	286.3	8715.5
Inflation (%)	55	7.57	5.72	-2.40	29.96

Table 4.3. Foreign banks presence and individuals' access to financial services

Probit estimations are performed. The dependent variable is a dummy equal to one if the respondent has a bank account at a formal financial institution or through a mobile money provider during the survey (*Formal Account*); a dummy equal to one if the individual saved using an account at a financial institution in the past twelve months (*Formal Saving*); or a dummy equal to one if the respondent borrowed from a formal financial institution in the past twelve months (*Formal Credit*). *Foreign Banks* is the share of bank assets managed by foreign banks, *Foreign Banks from D'ed Countries* those managed by foreign banks from developed countries, *Foreign Banks from D'ing Countries* those managed by foreign banks from developing countries (both African and non-African), *Pan-African Banks* those managed by Pan-African banks, and *Non-African Banks* those managed by foreign banks from non-African developing countries. Table reports marginal effects and associated z-score in parentheses. *, **, *** denote an estimate significantly different from 0 at the 10%, 5% or 1% level. Standard errors are adjusted for clustering at the survey (country#year) level.

	Formal Account			Formal Saving			Formal Credit		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Foreign Banks	-0.021 (-0.30)			-0.048 (-0.94)			0.018 -1.380		
Foreign Banks from D'ed Countries		0.140 (1.21)	0.140 (1.21)		0.038 (0.44)	0.062 (0.76)		0.037 (1.54)	0.038 (1.61)
Foreign Banks from D'ing Countries		-0.055 (-0.78)			-0.070 (-1.32)			0.015 (1.07)	
- Pan-African Banks			-0.055 (-0.78)			-0.046 (-0.90)			0.020 (1.41)
- Non-African Banks			-0.046 (-0.25)			-0.375* (-1.83)			-0.091** (-2.20)
Domestic Public Banks	-0.051 (-0.29)	-0.058 (-0.32)	-0.059 (-0.32)	-0.101 (-0.63)	-0.103 (-0.63)	-0.060 (-0.39)	0.002 (0.08)	0.002 (0.07)	0.017 (0.57)
ln(GDP per Capita)	0.061** (2.45)	0.057** (2.29)	0.057** (2.29)	0.028* (1.65)	0.027 (1.60)	0.037** (2.26)	-0.002 (-0.32)	-0.002 (-0.38)	0.000 (0.00)
Domestic Credit to Private Sector	0.200** (2.30)	0.206** (2.56)	0.206*** (2.56)	0.066 (1.21)	0.069 (1.31)	0.062 (1.21)	0.059*** (4.46)	0.060*** (4.69)	0.058*** (4.59)
Inflation	-0.234 (-0.77)	-0.291 (-1.00)	-0.295 (-1.00)	0.104 (0.29)	0.086 (0.25)	0.258 (0.85)	0.030 (0.44)	0.023 (0.36)	0.082 (1.42)

Female	-0.040***	-0.040***	-0.040***	-0.023***	-0.024***	-0.025***	-0.008**	-0.008**	-0.008**
	(-0.57)	(-5.15)	(-5.21)	(-3.23)	(-3.30)	(-3.37)	(-2.41)	(-2.45)	(-2.48)
Age	0.019***	0.019***	0.019***	0.016***	0.016***	0.016***	0.010***	0.010***	0.010***
	(13.73)	(13.83)	(13.90)	(11.23)	(11.23)	(11.36)	(10.59)	(10.53)	(10.81)
Age ²	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(-11.58)	(-11.61)	(-11.69)	(-9.72)	(-9.65)	(-9.79)	(-9.74)	(-9.68)	(-9.90)
Income - Poorest 20%	-0.232***	-0.214***	-0.214***	-0.203***	-0.203***	-0.200***	-0.059***	-0.059***	-0.058***
	(-15.83)	(-16.27)	(-16.34)	(-13.76)	(-13.76)	(-14.40)	(-9.60)	(-9.63)	(-9.90)
Income -Second 20%	-0.192***	-0.193***	-0.193***	-0.178***	-0.178***	-0.174***	-0.044***	-0.044***	-0.043***
	(-16.18)	(-16.45)	(-16.52)	(-14.59)	(-14.65)	(-14.78)	(-9.94)	(-10.01)	(-10.10)
Income - Third 20%	-0.138***	-0.139***	-0.139***	-0.121***	-0.121***	-0.120***	-0.032***	-0.032***	-0.032***
	(-13.28)	(-13.36)	(-13.42)	(-12.47)	(-12.49)	(-12.44)	(-7.82)	(-7.86)	(-7.94)
Income - Fourth 20%	-0.086***	-0.087***	-0.087***	-0.072***	-0.073***	-0.071***	-0.027***	-0.027***	-0.027***
	(-13.66)	(-13.80)	(-13.85)	(-13.54)	(-13.57)	(-13.01)	(-8.68)	(-8.79)	(-8.79)
Secondary Education	0.172***	0.171***	0.171***	0.162***	0.161***	0.156***	0.040***	0.040***	0.039***
	(10.72)	(10.51)	(10.76)	(10.40)	(10.37)	(10.21)	(8.64)	(8.74)	(8.60)
Tertiary Education	0.315***	0.314***	0.314***	0.247***	0.247***	0.247***	0.062***	0.062***	0.062***
	(10.48)	(9.87)	(9.78)	(9.71)	(9.79)	(10.13)	(5.42)	(5.37)	(5.62)
Number of observations	54047	54047	54047	36477	36477	36477	53862	53862	53862
# Countries	33	33	33	33	33	33	33	33	33
Pseudo R ²	0.179	0.184	0.184	0.151	0.153	0.159	0.087	0.087	0.090
Predicted probability (at mean values)	0.322			0.229			0.066		

Table 4.4. Pan-African banks and individuals' access to financial services, IV estimations

Instrumental variable models are performed. The dependent variable is a dummy equal to one if the respondent has a bank account at a formal financial institution or through a mobile money provider during the survey (*Formal Account*); a dummy equal to one if the individual saved using an account at a financial institution in the past twelve months (*Formal Saving*); or a dummy equal to one if the respondent borrowed from a formal financial institution in the past twelve months (*Formal Credit*). *Pan-African Banks* is the share of assets managed by Pan-African banks, and *Non-African Banks from D'ing Countries* those managed by foreign banks from non-African developing countries. F-1st stage refers to Kleibergen-Paap Wald rank F-statistic. Over-identification refers to Hansen over-identification test. Under the null hypothesis, instruments are orthogonal to the error terms and therefore respect the exclusion restriction. Tests of exogeneity (Hausman-type test in linear model and Wald test in probit model) compare instrumented model and non-instrumented model. Under the null hypothesis, both models provide similar results. Table reports marginal effects and associated z-score in parentheses. *, **, *** denote an estimate significantly different from 0 at the 10%, 5% or 1% level. Standard errors are adjusted for clustering at the survey (country#year) level.

	Formal Account		Formal Saving		Formal Credit	
	IV (1)	IV-Probit (2)	IV (3)	IV-Probit (4)	IV (5)	IV-Probit (6)
Pan-African Banks	0.260*	0.277*	0.209	0.198*	0.057*	0.050*
	(1.77)	(1.90)	(1.63)	(1.75)	(1.66)	(1.86)
Non-African Banks from D'ing Countries	0.129	0.123	-0.233	-0.259	-0.053	-0.062
	(0.50)	(0.47)	(-1.13)	(-1.02)	(-1.61)	(-1.63)
Foreign Banks from D'ed Countries	0.325**	0.384**	0.199	0.216*	0.061**	0.055**
	(2.03)	(2.27)	(1.50)	(1.70)	(2.12)	(2.25)
Domestic Public Banks	0.148	0.178	0.105	0.114	0.0362	0.038
	(0.62)	(0.70)	(0.53)	(0.56)	(0.91)	(1.20)
ln(GDP per Capita)	0.071***	0.081***	0.048***	0.050***	0.002	0.001
	(2.93)	(2.85)	(2.65)	(2.74)	(0.27)	(0.21)
Domestic Credit to Private Sector	0.374***	0.381***	0.176**	0.162**	0.090***	0.066***
	(3.37)	(3.46)	(2.05)	(2.13)	(5.15)	(4.69)
Inflation	0.0863	0.092	0.508	0.573	0.105	0.114*
	(0.25)	(0.23)	(1.43)	(1.53)	(1.50)	(1.76)
Female	-0.044***	-0.050	-0.028***	-0.029***	-0.009***	-0.007**
	(-5.77)	(-5.59)	(-4.07)	(-3.86)	(-2.76)	(-2.55)
Age	0.018***	0.022***	0.015***	0.017***	0.008***	0.009***
	(14.29)	(13.58)	(12.22)	(12.36)	(10.85)	(14.65)

Age ²	-0.000*** (-12.92)	-0.000*** (-12.10)	-0.000*** (-11.12)	-0.000*** (-10.68)	-0.0001*** (-10.17)	-0.0001*** (-12.68)
Income - Poorest 20%	-0.219*** (-14.38)	-0.245*** (-13.90)	-0.197*** (-12.69)	-0.210*** (-16.57)	-0.058*** (-9.68)	-0.051*** (-10.99)
Income - Second 20%	-0.203*** (-14.63)	-0.221*** (-13.92)	-0.183*** (-13.55)	-0.184*** (-17.85)	-0.048*** (-9.59)	-0.038*** (-9.10)
Income - Third 20%	-0.155*** (-12.00)	-0.157*** (-10.70)	-0.141*** (-12.04)	-0.126*** (-12.05)	-0.040*** (-7.88)	-0.028*** (-6.84)
Income - Fourth 20%	-0.100*** (-11.72)	-0.099*** (-10.30)	-0.092*** (-12.56)	-0.075*** (-11.26)	-0.035*** (-8.83)	-0.024*** (-8.42)
Secondary Education	0.184*** (9.81)	0.205*** (10.61)	0.161*** (9.66)	0.171*** (10.93)	0.039*** (8.34)	0.035*** (10.91)
Tertiary Education	0.356*** (11.21)	0.365*** (10.81)	0.305*** (9.43)	0.2601*** (10.29)	0.090*** (4.47)	0.055*** (6.59)
Number of observations	54047	54047	36477	36477	53862	53862
# Countries	33	33	33	33	33	33
R ²	0.185		0.148		0.043	
F-1st stage	7.044		8.582		7.031	
Over-identification test (p-value)	0.863		0.957		0.493	
Exogeneity test (p-value)	0.058	0.013	0.013	0.015	0.302	0.189
Predicted probability (at mean values)	0.322		0.229		0.066	

Table 4.5. Foreign banks presence and firms' access to credit

Probit estimations are performed. The dependent variable is a dummy equal to one if a firm has a loan or an overdraft (*Has a Loan*); or, a dummy equal to one for firms that obtained a loan and zero for discouraged borrowers or firms whose credit application was turned down (*Credit Experience*). *Foreign Banks* is the share of bank assets managed by foreign banks, *Foreign Banks from D'ed Countries* those managed by foreign banks from developed countries (both African and non-African), *Foreign Banks from D'ing Countries* those managed by foreign banks from developing countries, *Pan-African Banks* those managed by Pan-African banks, and *Non-African Banks* those managed by foreign banks from non-African developing countries. Table reports marginal effects and associated z-score in parentheses. *, **, *** denote an estimate significantly different from 0 at the 10%, 5% or 1% level. Standard errors are adjusted for clustering at the survey (country#year) level.

	Has a Loan			Credit Experience		
	(1)	(2)	(3)	(4)	(5)	(6)
Foreign Banks	0.137** (2.29)			0.151** (2.21)		
Foreign Banks from D'ed Countries		0.058 (0.64)	0.056 (0.62)		0.109 (0.90)	0.102 (0.81)
Foreign Banks from D'ing Countries		0.159*** (2.65)			0.160** (2.47)	
- Pan-African Banks			0.161*** (2.70)			0.167*** (2.56)
- Non-African Banks			0.027 (0.07)			-0.180 (-1.10)
Domestic Public Banks	-0.200** (-2.47)	-0.186** (-2.20)	-0.161 (-1.43)	-0.052 (-0.33)	-0.052 (-0.32)	0.023 (1.55)
ln(GDP per Capita)	-0.016 (-0.69)	-0.016 (-0.68)	-0.015 (-0.61)	-0.019 (-0.80)	-0.019 (-0.79)	-0.006 (-0.27)
Domestic Credit to Private Sector	0.003*** (3.39)	0.003*** (3.24)	0.003*** (3.25)	0.003*** (4.09)	0.003*** (4.04)	0.003*** (4.17)
Inflation	-0.006* (-1.87)	-0.006* (-1.82)	-0.006 (-1.63)	-0.003 (-1.21)	-0.003 (-1.20)	-0.002 (-0.91)
ln(Size)	0.080*** (14.53)	0.079*** (14.46)	0.079*** (14.10)	0.055*** (9.55)	0.055*** (9.56)	0.057*** (11.02)
ln(Age)	0.014	0.014	0.014	0.015**	0.015**	0.015**

	(1.30)	(1.30)	(1.30)	(2.24)	(2.28)	(2.25)
Local-Owned	0.100**	0.099**	0.099**	0.034	0.035	0.035
	(2.49)	(2.47)	(2.48)	(0.74)	(0.76)	(0.76)
Foreign-Owned	0.068	0.065	0.065	0.034	0.035	0.028
	(1.52)	(1.47)	(1.47)	(0.67)	(0.67)	(0.56)
Partnership	-0.056***	-0.055***	-0.055***	-0.055***	-0.057***	-0.052***
	(-3.07)	(-3.03)	(-3.12)	(-3.74)	(-3.94)	(-3.80)
Sole Proprietorship	-0.139***	-0.138***	-0.138***	-0.108***	-0.108***	-0.106***
	(-7.61)	(-7.58)	(-7.59)	(-8.06)	(-8.05)	(-8.25)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	21616	21616	21616	11346	11346	11346
# Countries	31	31	31	31	31	31
Pseudo R ²	0.172	0.173	0.173	0.197	0.197	0.202
Predicted probability (at mean values)	0.364			0.197		

Table 4.6. Pan-African banks and firms' access to credit

Instrumental variable models are performed. The dependent variable is a dummy equal to one if a firm has a loan or an overdraft (*Has a Loan*); or, a dummy equal to one for firms that obtained a loan and zero for discouraged borrowers or firms whose credit application was turned down (*Credit Experience*). *Pan-African Banks* is the share of assets managed by Pan-African banks, and *Non-African Banks from D'ing Countries* those managed by foreign banks from non-African developing countries. F-1st stage refers to Kleibergen-Paap Wald rank F-statistic. Over-identification to Hansen over-identification test. Under the null hypothesis, instruments are orthogonal to the error terms and therefore respect the exclusion restriction. Tests of exogeneity (Hausman-type test in linear model and Wald test in probit model) compare instrumented model and non-instrumented model. Under the null hypothesis, both models provide similar results. Table reports marginal effects and associated z-score in parentheses. *, **, *** denote an estimate significantly different from 0 at the 10%, 5% or 1% level. Standard errors are adjusted for clustering at the survey (country#year) level.

	Has a Loan		Credit Experience	
	IV (1)	IV-Probit (2)	IV (3)	IV-Probit (4)
Pan-African Banks	0.229*** (2.75)	0.270** (2.45)	0.259*** (3.79)	0.301*** (4.34)
Non-African Banks from D'ing Countries	0.194 (0.71)	0.441 (1.20)	0.259 (0.91)	0.649** (2.15)
Foreign Banks from D'ed Countries	0.101 (0.99)	0.142 (1.09)	0.090 (1.33)	0.156* (1.85)
Domestic Public Banks	-0.134 (-1.44)	-0.175 (-1.51)	0.58 (0.61)	0.052 (0.52)
ln(GDP per Capita)	-0.020 (-0.74)	-0.029 (-1.10)	0.010 (0.33)	-0.006 (-0.22)
Domestic Credit to Private Sector	0.003*** (2.93)	0.004*** (2.65)	0.003*** (3.37)	0.003*** (3.80)
Inflation	-0.006* (-1.79)	-0.008** (-1.98)	-0.003 (-0.86)	-0.004 (-1.19)
ln(Size)	0.088*** (14.62)	0.098*** (15.15)	0.072*** (9.24)	0.060*** (11.60)
ln(Age)	0.017 (1.44)	0.018 (1.33)	0.024** (2.49)	0.023*** (2.70)
Local-Owned	0.114*** (2.58)	0.125*** (2.81)	0.060 (0.96)	0.066 (1.33)
Foreign-Owned	0.085* (1.71)	0.089 (1.63)	0.036 (0.54)	0.041 (0.78)
Partnership	-0.068*** (-2.88)	-0.064*** (-2.79)	-0.065** (-2.45)	-0.038* (-1.74)
Sole Proprietorship	-0.147*** (-7.49)	-0.157*** (-7.54)	-0.112*** (-5.44)	-0.097*** (-6.15)
Industry fixed effects	Yes	Yes	Yes	Yes
Number of observations	21333	21333	11181	11181
# Countries	31	31	31	31
R ²	0.203		0.164	
F-1st stage	18.85		18.13	
Over-identification test (p-value)	0.453		0.682	
Exogeneity test (p-value)	0.889	0.764	0.004	0.001
Predicted probability (at mean values)	0.364		0.197	

Table 4.7. Robustness checks

Instrumental variable models are performed. The dependent variable is a dummy equal to one if the respondent has a bank account at a formal financial institution or through a mobile money provider during the survey (*Formal Account*); a dummy equal to one if the individual saved using an account at a financial institution in the past twelve months (*Formal Saving*); a dummy equal to one if the respondent borrowed from a formal financial institution in the past twelve months (*Formal Credit*); a dummy equal to one if a firm has a loan or an overdraft (*Has a Loan*); or, a dummy equal to one for firms that obtained a loan and zero for discouraged borrowers or firms whose credit application was turned down (*Credit Exp.*). We report marginal effect associated with PABs and associated z-statistics. In all specifications, usual control variables are added. *, **, *** denote an estimate significantly different from 0 at the 10%, 5% or 1% level. Standard errors are adjusted for clustering at the survey (country#year) level. For details, see Section 4.5.3.

	Financial inclusion of individuals					Firms' access to finance				Test	
	Account		Saving		Credit	Has a loan		Credit exp.			
(0)	0.277*	(1.90)	0.198*	(1.75)	0.050*	(1.86)	0.270**	(2.45)	0.301***	(4.34)	Baseline
<i>Panel A: Amount instead of Share</i>											
(1)	0.41**	(2.16)	0.307*	(1.84)	0.075**	(2.07)	0.295***	(2.83)	0.331***	(4.89)	Amount
<i>Panel B: Sub-sample</i>											
(2)	0.272*	(1.81)	0.17*	(1.66)	0.047*	(1.78)	0.288***	(2.92)	0.358***	(5.37)	W/out
(3)	0.519*	(1.90)	0.168	(1.57)	0.087*	(1.68)	0.259*	(1.65)	0.300***	(4.66)	Last wave
(4)	0.155	(0.69)	0.072	(0.49)	0.051	(1.45)	0.342***	(3.14)	0.378***	(5.65)	28 countries
(5)	-0.680	(-1.43)	-0.225	(-0.54)	0.583*	(1.81)	0.263*	(1.67)	0.204	(1.23)	> 5 obs.
<i>Panel C: Add control variables</i>											
(6)	0.191	(1.21)	0.133	(1.26)	0.043	(1.51)	0.222**	(2.28)	0.305***	(4.40)	Growth
(7)	0.236	(1.51)	0.196*	(1.83)	0.039	(1.24)	0.287***	(2.68)	0.327***	(4.59)	PopDens
(8)	-0.102	(0.61)	0.044	(0.75)	-0.008	(0.20)	0.302***	(3.11)	0.325***	(3.88)	PopUrban
(9)	0.295*	(1.89)	0.294**	(2.31)	0.049*	(1.73)	0.317***	(2.95)	0.335***	(4.10)	Cr Info
(10)	0.132	(1.18)	0.142	(1.46)	0.036	(1.37)	0.297***	(2.88)	0.342***	(4.02)	Cr Rights
(11)	0.288**	(2.46)	0.137	(1.61)	0.056**	(2.43)	0.348***	(3.01)	0.438***	(4.65)	Concent.
(12)	0.232	(1.60)	0.163*	(1.65)	0.044*	(1.82)	0.226*	(1.67)	0.281***	(3.93)	Boone
(13)	0.350*	(1.66)	0.181*	(1.78)	0.039*	(1.69)	0.289***	(3.27)	0.297***	(4.06)	Entry Rest
(14)	0.119	(0.39)	0.092	(1.08)	0.030	(1.28)	0.305***	(3.79)	0.290***	(4.15)	NIM
(15)	0.069	(0.36)	0.11	(1.03)	0.055	(1.47)	0.388***	(4.44)	0.302***	(4.63)	Spread
(16)	0.151	(1.25)	0.091	(0.92)	0.037	(1.59)	0.276***	(3.30)	0.302***	(4.63)	Overhead
(17)	0.069	(0.22)	0.178	(0.57)	0.049	(0.91)	0.230*	(1.95)	0.303***	(4.15)	Institution
(18)	0.193	(0.30)	0.089	(0.24)	0.011	(0.12)	0.325	(1.47)	0.371**	(2.00)	Corrupt
(19)	0.337*	(1.73)	0.148	(0.85)	0.058	(1.44)	0.388***	(2.83)	0.448**	(2.02)	Prim educ
(20)	0.065	(0.31)	-0.042	(0.63)	0.01	(0.29)	0.242**	(2.53)	0.294***	(4.19)	Sec educ
<i>Panel D: Strategy of instrumentation</i>											
(21)	0.261	(1.43)	0.193	(1.58)	0.044	(1.48)	0.260**	(2.60)	0.303***	(3.84)	Open alone
(22)	0.323	(0.97)	0.238	(0.68)	0.057	(1.09)	0.305*	(1.66)	0.296**	(2.11)	Dist alone
(23)	0.039	(0.16)	0.081	(0.63)	0.018	(0.55)	0.275**	(2.66)	0.303***	(4.37)	Min(dist)
(24)	0.282*	(1.87)	0.200*	(1.74)	0.052*	(1.64)	0.270**	(2.70)	0.301***	(4.25)	log(dist)
(25)	0.437**	(2.37)	0.292*	(1.79)	0.064**	(1.98)	0.154	(1.16)	0.187**	(2.18)	Trade
(26)	0.277**	(1.99)	0.245**	(2.05)	0.058**	(2.16)	0.254**	(2.36)	0.297***	(3.76)	Share

Table 4.8. Barriers to financial inclusion of households

Probit estimations and instrumental variable models are performed. The dependent variable is a dummy equal to one if the respondent answered that the following barrier explains why he does not have an account at a financial institution: a dummy equal to one if the respondent claimed that distance, cost and/or documentation are barriers to financial inclusion (*Involuntary Barriers due to the Bank*); a dummy equal to one when people answered that they lack money and cannot get financial services (*Involuntary Barriers due to the Household*); or a dummy equal to one when the respondent answered that he does not have an account at a financial institution because he does not trust banks (*Lack of Trust in Banks*). *Pan-African Banks* is the share of assets managed by Pan-African banks, and *Non-African Banks from D'ing Countries* those managed by foreign banks from non-African developing countries. F-1st stage refers to Kleibergen-Paap Wald rank F-statistic. Over-identification refers to Hansen over-identification test. Under the null hypothesis, instruments are orthogonal to the error terms and therefore respect the exclusion restriction. Tests of exogeneity (Hausman-type test in linear model and Wald test in probit model) compare instrumented model and non-instrumented model. Under the null hypothesis, both models provide similar results. Table reports marginal effects and associated z-score in parentheses. *, **, *** denote an estimate significantly different from 0 at the 10%, 5% or 1% level. Standard errors are adjusted for clustering at the survey (country#year) level.

	Involuntary Barriers due to the Bank			Involuntary Barriers due to the Household			Lack of Trust in Banks		
	Probit (1)	IV (2)	IV-Probit (3)	Probit (4)	IV (5)	IV-Probit (6)	Probit (7)	IV (8)	IV-Probit (9)
Pan-African Banks	-0.012 (-0.28)	0.086 (0.63)	0.082 (0.59)	0.053 (1.19)	0.204* (1.91)	0.226* (1.91)	-0.012 (-0.46)	-0.221** (-2.40)	-0.240** (-2.20)
Non-African Banks from D'ing Countries	-0.353* (-1.90)	-0.243* (-1.74)	-0.301 (-1.55)	-0.246** (-2.89)	-0.243* (-1.94)	-0.164* (-1.65)	-0.102** (-2.19)	-0.209*** (-2.75)	-0.214** (-2.15)
Foreign Banks from D'ed Countries	-0.054 (-0.70)	0.014 (0.12)	0.007 (0.05)	-0.153** (-1.97)	-0.042 (-0.32)	-0.024 (-0.18)	0.018 (0.38)	-0.13 (-1.22)	-0.149 (-1.27)
Domestic Public Banks	-0.214*** (-3.33)	-0.135 (-1.26)	-0.146 (-1.28)	0.023 (0.21)	0.134 (0.88)	0.145 (0.95)	-0.160*** (-3.37)	-0.273*** (-3.53)	-0.324** (-3.11)
CV	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	54098	54098	54098	37607	37607	37607	37208	37208	37208
#Countries	33	33	33	33	33	33	33	33	33
R ²	0.079	0.091		0.036	0.03		0.013	0.015	
F-1st stage		6.946			5.42			5.457	
Over-identification (p-value)		0.843			0.761			0.066	
Exogeneity test (p-value)		0.414	0.457		0.136	0.1		0.036	0.019
Predicted probability (at mean values)	0.328			0.783			0.141		

Table 4.9. How PABs affect firms' access to credit

Probit estimations are performed. The dependent variable is a dummy equal to one if a firm with a need for credit decides to apply for a loan in columns (1-2); a dummy equals to one if the firm applying for a loan has obtained a credit in columns (3-4); a dummy equals to one if a firm with a need for credit refuses to apply due to credit conditions in columns (5-6); and a dummy equals to one if a firm with a need for credit refuses to apply due to complex procedures in columns (7-8). *Foreign Banks* is the share of bank assets managed by foreign banks, *Foreign Banks from D'ed Countries* those managed by foreign banks from developed countries (both African and non-African), *Foreign Banks from D'ing Countries* those managed by foreign banks from developing countries, *Pan-African Banks* those managed by Pan-African banks, and *Non-African Banks from D'ing Countries* those managed by foreign banks from non-African developing countries. F-1st stage refers to Kleibergen-Paap Wald rank F-statistic. Over-identification refers to Hansen over-identification test. Under the null hypothesis, instruments are orthogonal to the error terms and therefore respect the exclusion restriction (tests are provided using linear model). Tests of exogeneity (Wald test) compare instrumented model and non-instrumented model. Under the null hypothesis, both models provide similar results. Table reports marginal effects and associated z-score in parentheses. *, **, *** denote an estimate significantly different from 0 at the 10%, 5% or 1% level. Standard errors are adjusted for clustering at the survey (country#year) level.

	Self-selection vs. bank's rejection				Why are firms discouraged?			
	Firm's Decision to Apply		Bank's Decision to Approve		Credit Conditions		Procedures	
	Probit (1)	IV-Probit (2)	Probit (3)	IV-Probit (4)	Probit (5)	IV-Probit (6)	Probit (7)	IV-Probit (8)
Pan-African Banks	0.173** (2.27)	0.466*** (4.11)	0.144** (2.26)	0.333* (1.74)	0.043 (1.02)	-0.110 (-1.21)	-0.153*** (-4.97)	-0.221*** (-5.04)
Non-African Banks from D'ing Countries	0.135 (0.26)	0.220 (0.39)	0.122 (0.46)	0.210 (0.80)	0.282 (0.72)	0.286 (0.68)	0.052 (0.16)	0.042 (0.14)
Foreign Banks from D'ed Countries	0.177 (1.40)	0.306** (2.46)	0.078 (0.83)	0.232 (1.24)	-0.077 (-1.02)	-0.135* (-1.82)	-0.014 (-0.39)	-0.034 (-0.58)
Domestic Public Banks	0.027 (0.19)	0.189 (1.36)	-0.142 (-1.61)	-0.043 (-0.28)	-0.253** (-2.33)	-0.365*** (-2.99)	0.081 (1.27)	0.074 (1.10)
CV	Yes	Yes	Yes	Yes	Yes		Yes	
Number of observations	11346	11180	2808	2808	11346		11346	
Pseudo R ²	0.141		0.195		0.05		0.049	
F-1st stage		15.6		2.41		15.6		15.6
Over-identification (p-value)		0.129		0.001		0.038		0.934
Exogeneity test (p-value)		0.003		0.376		0.014		0.311
Predicted probability (at mean values)	0.247		0.8		0.402		0.204	

Appendix

Appendix 1: Sample

Countries (33) included for the analysis on households' financial inclusion:

Algeria, Angola, Benin, Botswana, Burkina Faso, Cameroon, Congo, Cote d'Ivoire, Democratic Republic of Congo, Djibouti, Egypt, Ethiopia, Gabon, Ghana, Kenya, Lesotho, Madagascar, Mali, Mauritius, Morocco, Namibia, Niger, Nigeria, Rwanda, Senegal, South Africa, Sudan, Tanzania, Togo, Tunisia, Uganda, Zambia and Zimbabwe.

Countries (31) included for the analysis on firms' access to credit (date refers to survey's date):

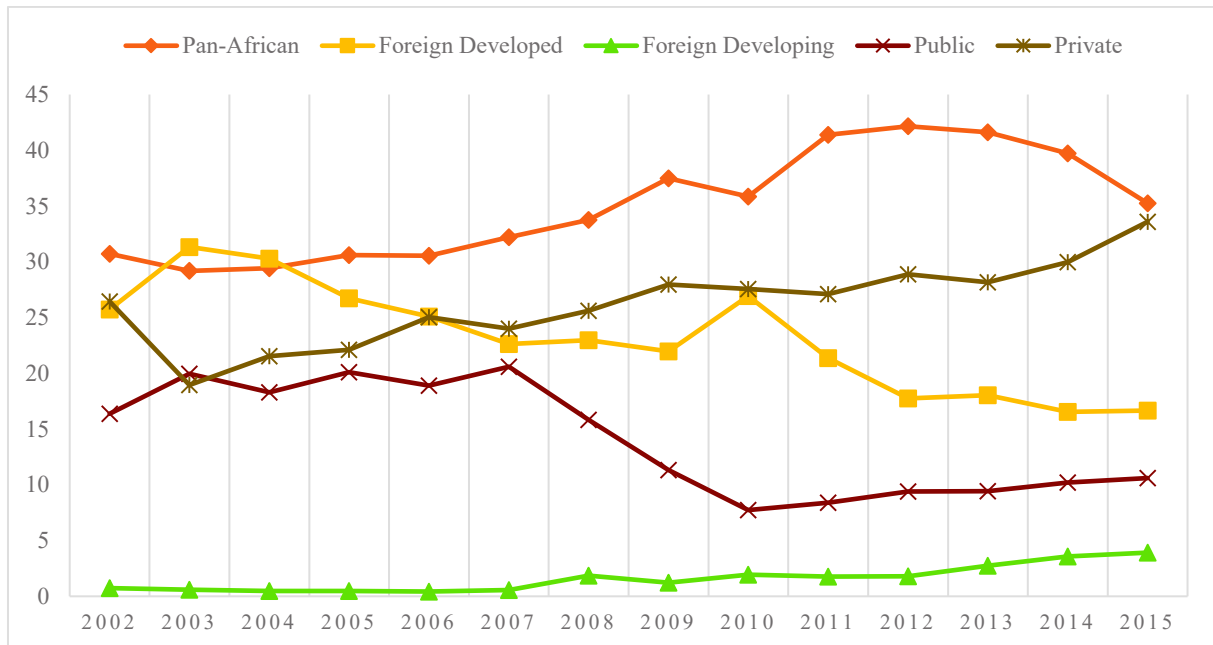
Angola (2006; 2010), Benin (2009; 2016), Botswana (2006; 2010), Burkina Faso (2009), Cameroon (2009-2016), Cape Verde (2009); Congo (2009), Cote d'Ivoire (2009; 2016), Democratic Republic of Congo (2006; 2010; 2013), Djibouti (2013), Egypt (2013; 2016), Eritrea (2009); Ghana (2007; 2013), Kenya (2007; 2013), Lesotho (2009; 2016), Madagascar (2009; 2013), Mali (2007; 2010; 2016), Mauritius (2009), Morocco (2013), Mozambique (2007); Namibia (2006; 2014), Niger (2009), Nigeria (2007; 2014), Senegal (2007; 2014), South Africa (2007), Sudan (2014), Tanzania (2006; 2013) Togo (2009; 2016), Tunisia (2013), Uganda (2013) and Zambia (2007; 2013).

Appendix 4.2. Description of the variables

Variable	Definition	Source
Formal Account	Dummy equal to one if the respondent has a bank account at a formal financial institution or through a mobile money provider	World Bank Findex database
Formal Saving	Dummy equal to one if the individual saved using an account at a financial institution in the past twelve months	World Bank Findex database
Formal Credit	Dummy equal to one if the respondent borrowed from a formal financial institution in the past twelve months	World Bank Findex database
Female	Dummy equal to one if the respondent is a woman	World Bank Findex database
Age	Age of the respondent	World Bank Findex database
Income - Poorest 20%	Dummy equal to one if income is in the first income quintile	World Bank Findex database
Income - Second 20%	Dummy equal to one if income is in the second income quintile	World Bank Findex database
Income - Third 20%	Dummy equal to one if income is in the third income quintile	World Bank Findex database
Income - Fourth 20%	Dummy equal to one if income is in the fourth income quintile	World Bank Findex database
Income - Richest 20%	Dummy equal to one if income is in the fifth income quintile	World Bank Findex database
Secondary Education	Dummy equal to one if the respondent has completed secondary education	World Bank Findex database
Tertiary Education	Dummy equal to one if the respondent has completed tertiary education	World Bank Findex database
Has a Loan	Dummy equal to one if the firm has a loan or an overdraft	World Bank Enterprise Surveys
Credit Experience	Dummy equal to one for firms that obtained a loan and zero for discouraged borrowers or firms whose credit application was turned down	World Bank Enterprise Surveys
Size	The number of employees in the firm	World Bank Enterprise Surveys
Age	Age of the firm	World Bank Enterprise Surveys
Domestic-Owned	Dummy equal to one if the firm is domestically-owned	World Bank Enterprise Surveys
Foreign-Owned	Dummy equal to one if the firm is foreign-owned	World Bank Enterprise Surveys
Partnership	Dummy equal to one if organizational type of the firm is a partnership	World Bank Enterprise Surveys
Sole Proprietorship	Dummy equal to one if organizational type of the firm is a sole proprietorship	World Bank Enterprise Surveys
Foreign Banks from D'ed Countries	The share of assets held by foreign banks from developed countries to total bank assets in a given country during a specific year	Authors' calculations based on Bankscope
Non-African Banks from D'ing Countries	The share of assets held by foreign banks from non-African developing countries to total bank assets in a given country during a specific year	Authors' calculations based on Bankscope
Pan-African Banks	The share of assets held by Pan-African banks to total bank assets in a given country during a specific year	Authors' calculations based on Bankscope
Domestic Public Banks	The share of assets held by domestic public banks to total bank assets in a given country during a specific year	Authors' calculations based on Bankscope
Domestic Credit to Private Sector (%)	Domestic credit to private sector as a proxy for financial development	World Development Indicators (WDI)
GDP per Capita	GDP per capita in constant 2010 U.S. dollars	World Development Indicators (WDI)
Inflation (%)	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly.	World Development Indicators (WDI)

Appendix 4.3. Evolution of bank ownership in Africa, 2002-2015:

This figure gives the share of each ownership type assets to total bank assets and its evolution over the period 2002-2015. *Pan-African* represents the assets share of PABs, *Foreign Developed* the share of foreign banks from developed countries, *Foreign Developing* the share of foreign banks from non-African developing economies, *Public* the share of domestic publicly-owned banks and *Private* the share of domestic privately-owned banks. Source: Authors' calculations based on Bankscope database.



General Conclusion

This dissertation contributes to a better understanding of banking in Africa with a special focus on bank ownership. African banking systems have been experiencing important changes since the enforcement of liberalization and privatization reforms in the late 1980s. Overall, the findings of this dissertation reveal that bank ownerships differ in their impact on African financial systems.

We chose to focus on the impact of the different ownership structures that coexist on the continent to assess the long-term impact of liberalization and privatization reforms since these reforms lead to a decrease in state-ownership of banks and an increase in foreign-ownership. One particular focus is made on Pan-African banks since these banks have been expanding their activities fast and are becoming systemic in an increasing amount of countries.

Chapter one reveals that foreign banks are more efficient than domestic banks and PABs are the most efficient banks on the continent. Moreover, institutional and geographical proximity influences efficiency.

Chapter two shows that Africa's banks are procyclical, but PABs are less procyclical than other banks. Foreign banks' lending growth is sensitive to home GDP per capita. Contagion risks are thus at stake.

Chapter three reveals that education and income are the most important determinants of financial inclusion. Women seem to be discriminated because of cultural factors rather than because of the financial system itself. Mobile banking is driven by the same determinants as formal traditional financial services.

Chapter four finally shows that PABs presence increases firms' access to credit and seems to increase households' financial inclusion. PABs require less strict procedures and increase trust in the banking system. No difference is observed between non-African foreign banks and domestic banks.

Overall, this work provides insights into how the heterogeneity of bank ownership influences African banking systems. Foreign banks are more efficient than their domestic

counterparts but do not differ from them in terms of credit cyclicity and of impact on financial inclusion. Pan-African banks, however, succeeded in combining their local and global advantages to become more efficient, less procyclical and more inclusive banks. They are linked to a strong banking group that has been able to expand its activities abroad and to develop a solid framework for capital and skills. Moreover, they are regional banks that enjoy higher proximity between host and home countries. Such proximity allows them to know better the environment and the clients than non-African foreign banks. Foreign banks in general do not harm host African banking systems but can rather improve them through the entrance of PABs.

However, the phenomenon of PABs must be observed on a longer period of study since these actors are still very young. The research in the future should focus on their systemic status and the prudential response to the risk of becoming too-big-to-fail. How should these systemic cross-border actors be regulated? Moreover, as regional banks, they could be politically linked to host banking countries in a different manner than non-African foreign banks. The issue of corruption is thus important to analyse. A possible future work could focus on the political links that could exist between PABs' managers and local politicians. Does the local status of PABs favour corruption? Do PABs favour a specific type of clients? The study of PABs needs additional empirical work.

Résumé détaillé en français

La fin des années 1980 a marqué un tournant pour les systèmes bancaires africains (Beck et Cull, 2015 ; Mecagni et al., 2015). De nombreuses réformes ont été entreprises pour libéraliser et privatiser les acteurs du secteur. Des réformes institutionnelles se sont ajoutées pour améliorer le cadre prudentiel.

À capitaux publics avant les réformes, l'actionnariat bancaire n'a cessé d'évoluer sur le continent. L'arrivée des banques étrangères a modifié le paysage bancaire, et ces banques étrangères ont elles-mêmes beaucoup évolué au cours du temps. Les banques occidentales, principalement européennes, se sont implantées sur le continent après les réformes. Pourtant, à partir des années 2000, leur rôle et leur présence ont commencé à se réduire au profit de nouveaux arrivants : les banques de pays émergents. Deux types de banques issues de pays émergents sont apparues depuis deux décennies : les banques à capitaux non-Africains issus de pays en développement⁴⁰ et celles à capitaux africains⁴¹ (aussi communément appelées banques panafricaines).

L'actionnariat bancaire influence les économies de diverses manières. La littérature scientifique sur le sujet s'est longtemps attelée à comparer les banques à capitaux publics aux banques privées, ainsi que les banques étrangères aux banques domestiques.

Du côté de l'offre, banques publiques et banques privées diffèrent car les banques publiques peuvent poursuivre des intérêts politiques ou sociétaux en plus des intérêts purement économiques et financiers (e.g. Dinç, 2005 ; Carvalho, 2014). Une telle différence en termes d'objectifs peut diminuer les performances bancaires et augmenter la corruption (e.g. Barry et al., 2016), mais peut aussi stabiliser le système financier en cas de récession (e.g. Bertay et al., 2015). Du côté de la demande, ménages et entreprises n'ont pas le même ressenti vis-à-vis des banques publiques et des banques privées (e.g. Coleman et Feler, 2015). Cet aspect est fortement lié à la culture du pays considéré. Les banques publiques peuvent susciter plus de confiance car les fonds publics rassurent les individus, surtout les plus averses au risque. D'un

⁴⁰ Comme par exemple la Chine, l'Inde, le Brésil ou le Bahreïn.

⁴¹ Les pays d'origine des banques panafricaines les plus importantes sont l'Afrique du Sud, le Kenya, le Maroc, le Nigéria et le Togo.

autre côté, elles peuvent diminuer la confiance des individus qui peuvent avoir peur de la corruption et des objectifs politiques pouvant détourner les fonds qu'elles placent.

Banques étrangères et banques domestiques peuvent différer pour d'autres raisons. Deux différences fondamentales sont principalement étudiées : les différences en termes de technicité et les différences en termes informationnelles. En développant leurs activités à l'étranger, les banques étrangères développent des méthodes et des outils innovants. De plus, ces acteurs ont un statut global qui leur permet un accès facilité au marché interbancaire et des liquidités importantes au sein du groupe. De telles différences permettent aux banques étrangères de gagner en performance et en efficacité par rapport à leurs homologues domestiques (e.g. Claessens et al., 2001), ce qui peut, à terme, bénéficier au système bancaire tout entier. L'utilisation d'outils innovants peut permettre d'augmenter l'accès aux services bancaires (e.g. Clarke et al., 2006). L'appartenance à un groupe solide permet aux banques de mieux résister aux chocs économiques dans les pays d'accueil (e.g. De Haas and van Lelyveld, 2014). En revanche, ce dernier point peut devenir problématique lorsque la maison-mère connaît des problèmes ; les filiales du groupe peuvent être impactées et ainsi propager les chocs économiques du pays d'origine aux pays d'accueil (e.g. Dekle et Lee, 2015).

La seconde principale différence entre banques étrangères et banques domestiques réside dans l'accès à l'information. Les banques étrangères ont une connaissance limitée de la clientèle et de l'environnement institutionnel dans lequel elles s'implantent par rapport à leurs homologues domestiques. Or l'information est précieuse dans le cadre de l'intermédiation bancaire puisqu'elle permet de réduire l'asymétrie d'information existante entre les prêteurs et les emprunteurs. Pour faire face aux asymétries d'information, les banques peuvent recourir à de l'information dite « *hard* » et de l'information dite « *soft* ». L'information *hard* repose sur l'utilisation de méthodes quantitatives pour évaluer la clientèle : historique de prêt, collatéral, informations comptables, etc. L'information *soft* repose sur l'utilisation de méthodes qualitatives, possible grâce aux relations de long terme qui s'établissent entre la banque et son client. Les banques domestiques ont un avantage comparatif par rapport aux banques étrangères car elles utilisent plus l'information *soft*. Grâce à leurs techniques innovantes, les banques étrangères peuvent développer un avantage comparatif dans l'utilisation de l'information *hard*. Le problème surtout rencontré dans les pays en développement est que les individus et les entreprises n'ont pas toujours la documentation nécessaire. Ainsi, les banques étrangères sélectionnent les clients les plus riches et les plus transparents (e.g. Beck et Brown, 2015). Une

telle discrimination peut avoir des répercussions négatives sur les banques domestiques qui sont privées de clients intéressants, et peut à terme impacter négativement le système bancaire dans son ensemble (e.g. Detragiache et al., 2008).

L'émergence des banques étrangères régionales pose de nouvelles questions à la recherche scientifique sur le sujet. Ces acteurs particuliers peuvent à la fois bénéficier des avantages des banques étrangères et des banques domestiques. Le continent africain représente un terrain d'étude idéal car les banques étrangères régionales, aussi appelées banques panafricaines, développent leurs activités dans de nombreux Etats africains et vont même jusqu'à remplacer certaines banques étrangères traditionnelles⁴². Les banques panafricaines les plus importantes sont présentes dans au moins dix pays africains et sont devenues systémiques (Enoch et al., 2015). Un tel statut rend important l'étude de leur impact sur les économies d'accueil.

L'objectif de cette thèse est de comparer l'impact des différents actionnariats bancaires sur trois thématiques : l'efficacité de coût, la cyclicité des portefeuilles de prêt et l'inclusion financière.

Cinq types d'actionnariat bancaires sont considérés dans ce travail. Les banques étrangères sont catégorisées en trois types : banques étrangères issues de pays développés, banques étrangères issues de pays en développement non-africains, et banques étrangères issues de pays en développement africains (banques panafricaines). Les banques domestiques sont séparées en deux types : banques domestiques à capitaux privées et banques domestiques à capitaux publiques. Cette distinction nous permet de comparer les banques étrangères aux banques domestiques, les banques publiques aux banques privées, et les banques étrangères entre elles. L'étude de l'impact de chaque actionnariat bancaire apporte aussi un éclairage sur l'impact de long-terme des réformes entreprises à la fin des années 1980. En effet, les privatisations ont réduit le rôle des banques publiques et la libéralisation des économies a permis la multiplication des banques étrangères.

Le premier chapitre étudie l'efficacité de coût des banques du continent⁴³. L'objectif est de mesurer l'efficacité de coût de chaque type de banque et de contrôler empiriquement

⁴² Par exemple, la banque marocaine Attijariwafa a racheté les filiales du groupe français Crédit Agricole dans cinq pays d'Afrique de l'Ouest en 2008.

⁴³ Papier co-écrit avec Laurent Weill, en révision pour la revue *Economic System*.

quelles sont les banques les plus efficaces du continent. L'efficacité de coût mesure la distance entre les coûts réels d'une banque et ses coûts optimaux lorsqu'elle produit la même quantité de produits et services.

Comme nous l'avons mentionné précédemment, banques étrangères et banques domestiques diffèrent dans leur accès à l'information. Ainsi, selon Berger et al. (2000), les banques domestiques profitent de leur statut local tandis que les banques étrangères bénéficient de leur statut global. Grâce à leur statut local, les banques domestiques ont une meilleure connaissance des clients et de l'environnement dans lequel elles opèrent tandis que leurs homologues étrangers doivent faire face à des coûts supplémentaires pour adapter leurs offres et services. En revanche, le statut global permet aux banques étrangères de développer des techniques de management plus pointues ainsi que des outils innovants leur permettant de réduire leurs coûts. Ainsi, les banques étrangères peuvent contrebalancer leur manque de connaissance du terrain par des dispositifs novateurs. Selon Berger et al. (2000), le statut global des banques étrangères leur permet d'être plus efficaces que leurs homologues domestiques dans les pays en développement tandis que le statut local des banques domestiques assurerait à ces dernières d'être plus efficaces dans les pays développés. Le premier objectif de ce chapitre est donc de vérifier empiriquement si banques étrangères et banques domestiques diffèrent en termes d'efficacité de coût en Afrique.

Le second objectif est de comparer les différents types de banques étrangères présentes sur le continent (banques étrangères issues de pays développés, banques étrangères issues de pays en développement, banques panafricaines). En nous basant sur les théories de Berger et al. (2000), nous avons développé l'hypothèse suivante : grâce à leur statut de banque régionale, les banques panafricaines devraient profiter à la fois d'avantages relatifs à leur statut local et à leur statut global. Elles profitent d'un statut local car elles s'implantent principalement par le biais de filiales ayant une relative indépendance (Beck et al., 2014). De plus, pays d'origine et pays d'accueil partagent de nombreuses similitudes culturelles et institutionnelles. Les banques panafricaines profitent aussi d'un statut global car elles ont développé des outils innovants et les groupes s'implantent sur le continent pour devenir systémiques.

Pour répondre à ces deux questions, nous étudions 248 banques actives dans 39 pays africains pendant la période allant de 2002 à 2015. Le modèle de frontière stochastique en une étape développé par Battese et Coelli (1995) est utilisé pour estimer l'efficacité de coût. Cette méthode nous permet de comparer l'efficacité de coût par type d'actionnariat bancaire. Dans

nos estimations additionnelles, nous cherchons à étudier l'impact de la proximité institutionnelle et géographique sur l'efficacité des banques étrangères. Toujours à l'aide du modèle de Battese et Coelli (1995), nous cherchons à tester empiriquement si la distance entre le pays d'origine et le pays d'accueil influence l'efficacité de coût de la banque étrangère.

Nos résultats démontrent que les banques étrangères sont plus efficaces que les banques domestiques, et que les banques panafricaines sont les banques les plus efficaces du continent. Ainsi, notre premier résultat confirme l'hypothèse de Berger et al. (2000) selon laquelle les banques étrangères sont plus efficaces que les banques domestiques dans les pays en développement. Notre second résultat confirme notre hypothèse principale selon laquelle les banques panafricaines, en tant que banques régionales, bénéficient à la fois d'un avantage local et d'un avantage global. Elles connaissent mieux le terrain que leurs homologues non-africains, et le groupe bancaire dans lequel elles opèrent leur donne accès à des outils et services plus innovants que ceux de leurs homologues domestiques. Notre travail additionnel nous permet de confirmer que la distance institutionnelle et la distance géographique impactent l'efficacité de coût des banques étrangères.

Le second chapitre analyse la cyclicité des portefeuilles de prêt⁴⁴. Les banques adoptent un comportement de prêt procyclique lorsqu'elles augmentent leur crédit de manière importante en période de forte croissance économique et réduisent leur crédit de manière significative en période de récession économique. En adoptant un tel comportement, les banques peuvent ainsi accentuer les difficultés lors de périodes de récession et augmenter les risques de menaces inflationnistes en périodes de forte croissance. La cyclicité des prêts est donc liée à la problématique plus globale de la stabilité de l'économie.

Il est important de distinguer les structures d'actionnariat bancaire puisque banques étrangères, banques domestiques privées et banques domestiques publiques peuvent adopter un comportement de prêt différent. Concernant les banques étrangères, elles peuvent être plus enclines à adopter un comportement procyclique par manque de loyauté envers leurs pays d'accueil (Fungáčová et al., 2013). Elles peuvent aussi considérer le pays d'accueil comme un second marché et être plus loyales et moins enclines à adopter un comportement procyclique (Bonin and Louie, 2017). Concernant les banques publiques, elles peuvent vouloir adopter un

⁴⁴ Papier co-écrit avec Laurent Weill, en révision pour la revue *Emerging Markets Review*.

comportement moins procyclique, voire contracyclique, pour poursuivre un objectif de stabilisation de l'économie (Micco and Panizza, 2006; Bertay et al., 2015; Behr et al., 2017).

Nous mesurons ainsi la sensibilité de la croissance de prêt des banques à la croissance du PIB par habitant du pays d'accueil. Notre échantillon est composé de 230 banques commerciales couvrant 38 pays africains sur la période allant de 2002 à 2015. Pour contrer les risques d'endogénéité, nous utilisons un modèle de données de panel dynamique à l'aide des Moindres Moments Généralisés (Arellano and Bover, 1995; Blundell and Bond, 1998). Nous cherchons aussi à étudier la question du risque de transmission des chocs du pays d'origine au pays d'accueil d'une banque étrangère. Pour cela, nous mesurons la sensibilité de la croissance de prêt des banques étrangères à la croissance du PIB par habitant du pays d'origine.

Nos résultats sont les suivants. Premièrement, toutes les banques du continent adoptent un comportement procyclique. En revanche, les banques panafricaines adoptent un comportement moins procyclique que leurs homologues étrangers et domestiques. Enfin, la croissance de prêt des banques étrangères est sensible à l'évolution de la croissance du PIB par habitant du pays d'origine. L'entrée des banques étrangères dans le système bancaire n'augmente donc pas la cyclicité des prêts et peut même la réduire si ce sont des banques panafricaines qui augmentent leurs activités. Dans nos tests de robustesse, nous prenons en compte la crise financière de 2008 et constatons que les banques étrangères issues de pays développés sont les seuls à avoir réduit leurs prêts pendant la période suivant la crise.

Les deux derniers chapitres sont consacrés à la question de l'inclusion financière. Le troisième chapitre⁴⁵ introduit le sujet en analysant les déterminants microéconomiques de l'inclusion financière des ménages africains. La mesure la plus basique de l'inclusion financière est la détention d'un compte en banque. Une fois qu'un individu détient un compte bancaire, il peut réaliser ses paiements, transférer de l'argent, épargner et emprunter.

Dans ce premier chapitre sur l'inclusion financière, nous nous attardons sur les quatre déterminants microéconomiques que sont le revenu, le sexe, l'âge et l'éducation des individus et leur influence sur trois mesures de l'inclusion financière : la possession d'un compte bancaire, l'épargne dans une institution financière formelle, et la détention d'un crédit dans une institution financière formelle. Pour mesurer l'impact de ces caractéristiques

⁴⁵ Papier co-écrit avec Laurent Weill, publié dans *Review of Development Finance* 6, (2016).

microéconomiques, nous utilisons la méthode du probit puisque nos variables dépendantes sont des variables binaires. La base de données utilisée est la Global Findex database de la Banque Mondiale qui couvre 37 pays africains en 2014. En plus de la question globale de l'inclusion financière, nous étudions aussi l'impact des caractéristiques microéconomiques sur les barrières à l'inclusion financière, sur les services bancaires mobiles, sur les motivations qui poussent à épargner et emprunter, ainsi que sur le recours à la finance informelle.

Nos résultats démontrent que le fait d'être de sexe masculin, plus riche, plus éduqué et plus âgé jusqu'à un certain âge augmente la probabilité d'être inclus financièrement. L'éducation et le revenu sont les caractéristiques les plus importantes tandis que le genre est moins influent. L'analyse des barrières à l'inclusion financière nous permet de conclure que les femmes sont exclues financièrement à cause de raisons culturelles car les caractéristiques du système bancaire ne jouent pas un rôle significatif pour elles. Lorsque les personnes sont plus éduquées, toutes les barrières à l'inclusion financière sont réduites. Enfin, les caractéristiques microéconomiques influencent l'utilisation de services bancaires mobiles de la même manière que l'utilisation de services financiers de base.

Le dernier chapitre⁴⁶ étudie le lien entre l'actionnariat bancaire et l'inclusion financière. L'objectif est de contrôler empiriquement si la présence de banques étrangères influence l'inclusion financière et comment. Comme précédemment, nous séparons les banques étrangères en trois catégories pour pouvoir analyser le cas spécifique des banques panafricaines. En tant que banques régionales, les banques panafricaines devraient profiter de leur statut local pour utiliser plus d'information soft que leurs homologues étrangers non-africains.

Un modèle probit est utilisé pour étudier l'impact de la présence des banques étrangères sur l'inclusion financière des ménages et des entreprises du continent. A cause de l'existence d'un potentiel risque d'endogénéité, un modèle instrumental est utilisé. Nous instrumentons la présence des banques panafricaines à l'aide de la distance géographique et des échanges commerciaux entre pays d'accueil et pays d'origine de la banque. Pour construire notre base de données, nous avons combiné un échantillon de 230 banques avec la base de données Enterprise Surveys de la Banque Mondiale pour les entreprises et la base de données Global Findex de la

⁴⁶ Papier co-écrit avec Florian Léon.

Banque Mondiale pour les ménages. La période couverte pour les entreprises va de 2006 à 2014 et la période pour les ménages couvre les années 2011 et 2014.

Nos résultats démontrent que la présence de banques panafricaines augmente l'accès au crédit des entreprises. Ce résultat est robuste lorsque nous considérons de nombreux tests de robustesse. Nous observons aussi que la présence de banques panafricaines augmenterait l'inclusion financière des ménages, mais le résultat est moins robuste que pour les entreprises. Nous expliquons nos résultats par le fait que les banques panafricaines bénéficient à la fois de leur statut global qui leur procure une expertise technique plus grande et de leur statut local qui leur assure une plus grande proximité culturelle, institutionnelle et géographique. Les banques panafricaines peuvent ainsi utiliser des techniques *hard* et *soft* pour estimer la qualité de leurs clients. Nous observons aussi que les banques panafricaines augmentent la confiance des individus dans le système bancaire. Elles semblent aussi mettre en place des procédures moins strictes dans l'accession aux services bancaires.

Ouverture

Ce travail a donc permis d'apporter un éclairage sur l'hétérogénéité de l'actionnariat bancaire et son impact sur différents aspects des systèmes bancaires africains. Les banques étrangères tout d'abord sont plus efficaces que leurs homologues domestiques, mais ne sont pas différentes de ces dernières en termes de cyclicité des prêts et d'impact sur l'inclusion financière. En revanche, les banques panafricaines ont réussi à combiner leurs avantages locaux et globaux pour devenir les banques les plus efficaces en termes de gestion des coûts, pour adopter un comportement de prêt moins cyclique et pour favoriser l'inclusion financière des entreprises principalement et des ménages dans une moindre mesure. Si les banques étrangères dans leur ensemble n'ont pas un impact néfaste sur les économies africaines, force est de constater que les banques panafricaines semblent favoriser l'émergence de systèmes bancaires efficaces, stables et inclusifs en Afrique.

Il est évidemment important de garder en tête que l'émergence de ces nouveaux acteurs est très récente et la récence du phénomène requiert une étude plus étendue dans le futur. De plus, de nombreuses questions restent en suspens. Tout d'abord d'un point de vue économique, le caractère systémique que les banques panafricaines sont en train d'acquiescer pose la question de la gestion des établissements de crédit *too-big-to-fail*. Comment réglementer ces acteurs

transfrontaliers ? Les autorités prudentielles doivent se pencher sur cette question qui devient de plus en plus fondamentale à mesure que le système bancaire se développe. Ensuite, la présence des banques panafricaines peut aussi s'analyser d'un point de vue politique. Dans des économies encore rongées par une forte corruption, peut-on observer des liens politiques entre managers des banques panafricaines et hommes politiques africains ? Est-ce que leur statut local favorise la corruption ? Est-ce que les banques panafricaines favorisent un type bien précis de clients ? L'étude des banques panafricaines continue donc de nécessiter un travail scientifique conséquent.

Références

- Arellano, M., Bover, O., 1995. Another Look at the Instrumental-Variable Estimation of Error-Components. *Journal of Econometrics* 68, 29–52.
- Barry, T.A., Lepetit, L., Strobel, F., 2016. Bank ownership structure, lending corruption and the regulatory environment. *Journal of Comparative Economics* 44, 732–751.
- Battese, G.E., Coelli, T.J., 1995. A model for technical inefficiency effects in a stochastic frontier production function for panel data. *Empirical Economics* 20, 325–332.
- Beck, T., Brown, M., 2015. Foreign bank ownership and household credit. *Journal of Financial Intermediation* 24, 466–486.
- Beck, T., Cull, R., 2015. Banking in Africa, in: *The Oxford Handbook of Banking*, Oxford University Press. Allen N. Berger, Philip Molyneux and John O.S. Wilson, pp. 913 – 937.
- Beck, T., Fuchs, M., Singer, D., Witte, M., 2014. Making Cross-Border Banking Work for Africa. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and International Bank for Reconstruction and Development / The World Bank.
- Behr, P., Foos, D., Norden, L., 2017. Cyclicity of SME lending and government involvement in banks. *Journal of Banking and Finance* 77, 64–77.
- Berger, A.N., DeYoung, R., Genay, H., Udell, G.F., 2000. The globalization of financial institutions: Evidence from cross-border banking performance. *Brookings-Wharton Papers on Financial Services* 3, 23–125.
- Bertay, A.C., Demirgüç-Kunt, A., Huizinga, H., 2015. Bank ownership and credit over the business cycle: Is lending by state banks less procyclical? *Journal of Banking and Finance* 50, 326–339.
- Blundell, R., Bond, S., 1998. Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. *Journal of Econometrics* 87, 115–143.
- Bonin, J.P., Louie, D., 2017. Did foreign banks stay committed to emerging Europe during recent financial crisis? *Journal of Comparative Economics* Article in press, 1–16.
- Carvalho, D., 2014. The Real Effects of Government-Owned Banks: Evidence from an Emerging Market. *The Journal of Finance* LXIX, 577–609.
- Claessens, S., Demirgüç-Kunt, A., Huizinga, H., 2001. How does foreign entry affect domestic banking markets? *Journal of Banking and Finance* 25, 891–911.
- Clarke, G.R.G., Cull, R., Martínez Pería, M.S., 2006. Foreign bank participation and access to credit across firms in developing countries. *Journal of Comparative Economics* 34, 774–

- Coleman, N., Feler, L., 2015. Bank ownership, lending, and local economic performance during the 2008–2009 financial crisis. *Journal of Monetary Economics* 71, 50–66.
- De Haas, R., van Lelyveld, I., 2014. Multinational banks and the global financial crisis: Weathering the perfect storm. *Journal of Money, Credit and Banking* 46, 333–64.
- Dekle, R., Lee, M., 2015. Do foreign bank affiliates cut their lending more than the domestic banks in a financial crisis? *Journal of International Money and Finance* 50, 16–32.
- Detragiache, E., Tressel, T., Gupta, P., 2008. Foreign Banks in Poor Countries: Theory and Evidence. *The Journal of Finance* 63, 2123–2160.
- Dinç, I.S., 2005. Politicians and banks: Political influences on government-owned banks in emerging markets. *Journal of Financial Economics* 77, 453–479.
- Enoch, C., Mathieu, P., Mecagni, M., 2015. Pan-African Banks. Opportunities and Challenges for Cross-Border Oversight. International Monetary Fund, Washington, D.C.
- Fungáčová, Z., Herrala, R., Weill, L., 2013. The influence of bank ownership on credit supply: Evidence from the recent financial crisis. *Emerging Markets Review* 15, 136–147.
- Mecagni, M., Marchettini, D., Maino, R., 2015. Recent trends in banking in sub-Saharan Africa: from financing to investment. The European Investment Bank.
- Micco, A., Panizza, U., 2006. Bank ownership and lending behavior. *Economics Letters* 93, 248–254.

Résumé

Cette thèse étudie les systèmes bancaires africains et se concentre tout particulièrement sur la question de l'actionnariat bancaire et de ses impacts.

Le premier chapitre étudie l'efficacité de coût. Les banques étrangères sont plus efficaces que les banques domestiques et les banques panafricaines sont les banques les plus efficaces du continent.

Le second chapitre étudie la cyclicité des portefeuilles de prêt. La croissance des prêts des banques africaines est sensible à l'évolution de la croissance du PIB par habitant. Les banques panafricaines ont une croissance des prêts moins cyclique. La croissance des prêts des banques étrangères est sensible à l'évolution de la croissance dans leur pays d'origine.

Les chapitres trois et quatre étudient l'inclusion financière. La probabilité d'être inclus financièrement augmente lorsque l'individu est de sexe masculin, a un revenu plus élevé, une éducation plus importante, et est plus âgé jusqu'à un certain seuil. La présence des banques panafricaines augmente l'accès au crédit des entreprises. Les banques panafricaines augmenteraient aussi l'inclusion financière des ménages, mais ce résultat est moins robuste.

La conclusion générale de cette thèse souligne le rôle nouveau et bénéfique que jouent les banques panafricaines sur le continent. Ces jeunes institutions financières augmentent l'efficacité de coût, diminuent la cyclicité des portefeuilles de prêt, et améliorent l'inclusion financière.

Mots clés : Banques, Banques panafricaines, Afrique, Efficacité de coût, Cyclicité des prêts, Inclusion financière, Banques étrangères

Summary

This dissertation studies African financial systems with a focus on bank ownership.

Chapter one studies cost efficiency. Foreign banks are more efficient than domestic banks, and Pan-African banks are the most efficient banks on the continent.

Chapter two analyses lending procyclicality. Lending growth of African banks is sensitive to the GDP per capita growth. Pan-African banks have a less pro-cyclical lending behaviour. Lending growth of African foreign banks is sensitive to GDP per capita growth in their home country.

Chapter three and four study financial inclusion. Being male, wealthier, more educated and older to a certain extent increases the likelihood to be financially included. Pan-African banks presence increases firms' access to credit. Pan-African banks would also increase households' financial inclusion, but such result is less robust.

The general conclusion of this dissertation underlines the new, beneficial role Pan-African banks play on the continent. These young financial institutions increase cost efficiency, reduce cyclicity of lending and improve financial inclusion.

Keywords: Banks, Pan-African Banks, Africa, Cost Efficiency, Lending Cyclicity, Financial Inclusion, Foreign Banks.