## SYNTHESIS REPORT

## **Growth Research** Programme



# Sub-Saharan Africa's interbank markets: progress, barriers and policy implications

**Sherillyn Raga and Judith Tyson** February 2021

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## About DEGRP

The Development and Economic Growth Research Programme (DEGRP) funds world-class scientific research on inclusive economic growth in low-income countries (LICs). The programme's principal aim is to generate policy-relevant research on four key areas: financial sector development and growth; agriculture and growth; innovation and growth; and China's engagement in sub-Saharan African countries.

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Cover image: A bank building in the central streets of Ghana's capital, Accra. April 2018. Photo: Truba7113/Shutterstock.com.

## About the authors

Sherillyn Raga is a Senior Research Officer in ODI's International Economic Development Group (IEDG).

Judith Tyson is a Research Fellow in the IEDG and is the Evidence and Policy Group's Finance lead.

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## Acronyms

BCEAO	Banque Centrale des États de l'Afrique de l'Ouest (Central Bank of West African States)
ВоТ	Bank of Tanzania
CAR	capital adequacy ratios
DEGRP	Development and Economic Growth Research Programme
ESRC	UK Economic and Social Research Council
FCDO	Foreign, Commonwealth and Development Office
GDP	gross domestic product
GFD	Global Financial Development
GHS	Ghanaian cedi
IEDG	International Economic Development Group
IMF	International Monetary Fund
IPO	initial public offering
ІТ	inflation targeting
KES	Kenyan shilling
LIC	low-income country
MWK	Malawian kwacha
NGN	Nigerian naira
OBB	open buy back
SII	systemically important institution
TZS	Tanzanian shilling
UGX	Ugandan shilling
WAEMU	West African Economic and Monetary Union
WDI	World Development Indicator
XOR	West African CFA franc
ZMW	Zambian kwacha

#### **Executive summary**

A well-functioning financial sector can be a driver of economic development. In the last decade, there has been a broad deepening of the banking sector, a notable expansion of financial access and strengthening of regulation across sub-Saharan Africa. Despite this progress, the banking sector in the region continues to suffer from a lack of competition, high borrowing costs, low levels of credit and a concentration of bank lending in the extractive sector.

Interbank markets have a role to play in enabling economic growth in regions such as sub-Saharan Africa, but this will only happen if efforts are made to develop and deepen them. A well-functioning interbank market redistributes funds between banks, improves price discovery, encourages competition and subsequently lowers lending rates into the real economy. In addition, interbank rates, as a conduit of monetary policy transmission, impact the pricing of much-needed lending for Africa's productive sectors. Interbank markets can also act as an insurance against liquidity shocks and contribute to financial stability, since the interbank network provides a secondary market where banks can access funds and diversify their assets, underpinned by peer monitoring of counterparty risks. In this context, this paper aims to present a landscape of interbank markets in sub-Saharan Africa, recent evidence on the factors that hinder their development, and the policy implications for financial regulators. The paper also highlights the contributions made to this debate by the projects funded under the Development and Economic Growth Research Programme (DEGRP), and the insights gathered from academics and central bank officers focusing on interbank markets in the region.

#### Findings

In sub-Saharan African countries, **recent Economic and Social Research Council (ESRC) research identified two key factors that impede the development of efficient interbank markets:** (1) market segmentation and; (2) high levels of perceived risk. In addition, financial regulators are challenged to mitigate financial contagion risks developing in sync alongside the deepening of interbank networks.

- Market segmentation includes differential interbank pricing and access to funds between different institutions. ESRC research shows that this is often driven by the size and ownership of banks. Large banks enjoy lower borrowing costs in the interbank market, while smaller banks are charged higher rates, regardless of their financial soundness. Foreign and large banks that typically have the biggest deposit base usually only conduct interbank trading among each other. This can leave smaller banks without access to liquidity from interbank markets. In addition, foreign banks are reported to have opaque internal credit limits that are lower than justified by fundamental risks and which keep interbank interest rates high despite excess reserves in the market.
- Meanwhile, persistently high levels of perceived risk result from the low level of market confidence emanating from information asymmetry and 'price stickiness'; this is compounded by the structural risks associated with an underdeveloped financial market. This partially explains the generally low levels of interbank engagements in sub-Saharan Africa; the dominance of overnight transactions (despite some countries having different interbank maturity profiles) as banks try to limit their risk exposure within the shortest period; and the dominance of collateralised transactions (e.g. 96% in Nigeria as of 2018) in interbank markets where both secured and unsecured segments are available.

#### Implications

The barriers identified above **limit the potential role of the interbank market in increasing the efficiency of sub-Saharan Africa's banking sector.** This leads to three main policy implications for financial regulators in the region:



- *Deepen the interbank market.* Regulators should continue efforts to foster competition and widen participation in the interbank market by enhancing information disclosure, improving market infrastructure, developing complementary collateral markets (e.g. government securities market), encouraging market-driven guarantee schemes, and tailoring central bank policy tools (e.g. liquidity facilities, reserve requirements and interest rates) that can directly influence the volume of interbank transactions.
- Manage contagion risks in a segmented interbank market. Regulators also need to balance efficiency gains from deepening interbank markets with the need to mitigate contagion risks from increasingly connected bank networks in the context of a segmented market. As a first line of defence, central banks need to enhance macro-financial surveillance efforts and micro-prudential supervision of interbank market participants. There is also a case to assign relatively higher capital and liquidity buffers to larger banks in proportion to their systemic importance in the financial sector. Given the volatile behaviour of the unsecured markets in times of liquidity crunch, developing the collateralised markets may also provide relatively higher resilience to the financial system during shock episodes.
- *Create space for market discipline in the interbank market.* Regulators should support the market disciplining role of interbank markets in mitigating bank riskiness and improving bank capitalisation. To support this mechanism, central banks should promote more frequent and a wider scope of information disclosure on banks' interbank positions, financial conditions, and liquidity and risk management. Enhancing a competitive environment that can foster innovation on accessibility of information on counterparty risks may also curb incentives for interbank players' excessive risktaking activities.

More research is needed to better understand the country- and regional-level barriers to: developing interbank markets, the impact of interbank markets on improving the financial sector and real economy, and the magnitude of financial contagion that can be channelled through the interbank markets according to the type of financial stress (e.g. domestic liquidity shock, global and regional financial crises, epidemic/pandemic-induced financial volatility). However, robust results can only be achieved by using comprehensive banklevel data, which is currently limited and only available to central banks. This highlights the need for continued collaboration between central bank researchers and academics in order to conduct bank-level studies with findings that will ultimately benefit financial regulators in the region.

# Box 1 The contribution of DEGRP to research on interbank market development in sub-Saharan Africa

The **DEGRP funds world-class scientific research on inclusive economic growth in low-income countries**. The programme's principal aim is to generate policy-relevant, high-quality research and promote effective communication of that research to key policy decision-makers around the world.

It is supported by the **Evidence and Policy Group (EPG)**, **based at ODI**, whose goal is to maximise the profile, uptake and impact of DEGRP research. Its main outputs are individual research programmes, published papers and convening programmes for academics, regulators, policy-makers and other stakeholders. Research projects show a great diversity of method and topic, with a wide range of theoretical, quantitative, qualitative, cross-border and case-study analyses, with topics spanning from high-level macroeconomic research to in-depth examination of particular issues.

In relation to this synthesis paper, prior to the DEGRP-funded projects discussed, there was very limited research relating to interbank markets in the region and to the development process of interbank markets more generally in developing countries. Indeed, for a number of countries, there was essentially no academic research on the topic.

**The body of research conducted under the programme has substantially created and deepened the evidence base in relation to interbank market development in the region**. The papers cover a variety of different research topics including examining market segregation, regulatory environments and the role of interbank market development in broader financial development. Uniquely, the papers are also largely country specific and led by academics and researchers based in a number of the region's central banks. As such, the collection of papers represents a unique advance in the evidence base in relation to interbank market development in the region and has been led by uniquely well-informed authors.

Further, the synthesis paper has been accompanied by a number of dissemination events that have deepened this work and broadened its impact. These have included **workshops led by the ODI for the researchers** from the different countries to encourage their networking and engagement relating to their findings, the implications of their work, and research gaps.

It also included a workshop event hosted by the 'Making Finance Work for Africa' partnership, which is an initiative to support the development of the African financial sector through working with African governments, the private sector and development partners to coordinate financial sector development interventions across the continent, avoiding duplication and maximising development impact.

#### 1. Introduction

The financial sector drives economic growth and is an essential enabler of economic development (Tyson and Beck, 2018). The key aspect of this enabling mechanism is the mobilisation of savings into investment in the real economy. However, optimally this combines with the low cost of capital, long-dated financing and effective risk management and financial stability (Griffith-Jones et al., 2014; Tyson and Beck, 2018).

In light of this, African economies stand to benefit from a deeper, more liquid and more efficient financial system that supports structural economic transformation, economic diversification, and trade and financial inclusion.

Progress has been made over the last decade in financial development. Achievements include a broad deepening of the banking sector and a notable expansion of financial access (Figures 1 and 2). Regulation has been strengthened across the region including adoption of appropriate aspects of Basel III (Jones and Zeitz, 2017; Jones, Woods and Beck, 2018).

However, Africa's banking sector continues to suffer from weaknesses that impede its role in economic development.

Credit – both relative to gross domestic product and in absolute terms – remains too small. It is lower than in other regions and lags way below the performance of middle- and high-income countries. As of 2018, banks' domestic credit to the private sector is at 28% of GDP in sub-Saharan Africa, five times smaller than in East Asia and Pacific countries (140%) and only around half that in the Middle East and North Africa, Latin America and South Asia

#### Figure 1 Financial institutions depth index for selected African countries (2000–2018)



SOURCE: IMF FINANCIAL DEVELOPMENT DATABASE (FOR SUB-SAHARAN AFRICA ECONOMIES WITH GDP ABOVE \$20 BILLION EXCLUDING ZIMBABWE).

NOTE: FINANCIAL INSTITUTIONS DEPTH INDEX REFERS TO COMPILED DATA ON BANK CREDIT TO THE PRIVATE SECTOR IN PERCENT OF GDP, PENSION FUND ASSETS TO GDP, MUTUAL FUND ASSETS TO GDP AND INSURANCE PREMIUMS, LIFE AND NON-LIFE TO GDP



#### Figure 2 Financial institutions access index for selected African countries (2000–2018)

SOURCE: IMF FINANCIAL DEVELOPMENT DATABASE (FOR SUB-SAHARAN AFRICA ECONOMIES WITH GDP ABOVE \$20 BILLION EXCLUDING ZIMBABWE). NOTE: FINANCIAL INSTITUTIONS ACCESS INDEX REFERS TO COMPILED DATA ON BANK BRANCHES PER 100,000 ADULTS

(Table 1). Credit is also concentrated in a few sectors such as extractives. By contrast, important sectors for inclusive economic development, such as agriculture and manufacturing, remain constrained by lack of finance (Beck et al., 2007; Griffith-Jones et al., 2014; Bationo et al., 2020).

AND ATMS PER 100.000 ADULTS

Another problem is that the cost of credit is high. In 2018, for example, compared to other geographical regions, sub-Saharan Africa had the highest margins between the lending and deposit rate (10.6%), and the highest bank returns on assets (1.9%) and equity (16.8%) (Tables 1 and 2). In addition, based on historical data, subsidiaries of foreign banks were reported to operate at higher profits in sub-Saharan Africa than elsewhere (Honohan and Beck, 2007).

There is some debate about the causes of these high costs. Griffith-Jones et al. (2014) argue that the high spreads that result in high profitability are not justified, since banks in Africa lend to creditworthy borrowers with low defaults. Instead, it is argued that the high costs are related to the lack of competition in the credit market – an assertion supported by Africa's low H-statistic (Table 2).

However, the argument is not supported by the observation that, despite increasing competition between sub-Saharan African banks in the last decade, high margins have persisted. For instance, Griffith-Jones et al. (2014) find that high spreads in Ghana hardly fell despite the significant increase in the number of banks in recent years (Table 2).

Developing and deepening interbank markets may help tackle some of these problems because, if they are well-functioning, they can improve overall market efficiency by re-distributing liquidity within the banking system, improve price discovery and encourage competition. This, in turn, should translate into lower lending rates for the real economy. Additionally, interbank rates can be a conduit of monetary policy transmission and, if targeted well, can directly impact the pricing of much-needed loans for Africa's productive sectors. We explore these potential contributions of the interbank markets further in the next section.

#### Table 1 Financial sector depth and profitability

	Sub- Saharan Africa	East Asia and Pacific	South Asia	Latin America and Caribbean	Middle East and North Africa	Low income	Middle income	High income
Financial depth								
Domestic credit provided by financial sector (% of GDP), 2018 <sup>1</sup>	39.6	209.5	70.0	74.9	80.9	28.5	137.5	140.6
Domestic credit to private sector by banks (% of GDP), 2018 <sup>1</sup>	27.9	139.4	46.9	49.3	55.4	18.7	100.8	82.3
Financial sector profit and spreads								
Interest rate spread (lending rate minus deposit rate, %) 2018²	10.6	5.3	5.6	8.2	3.6	16.6	6.6	4.4

NOTES AND SOURCES: 1. AGGREGATED WORLD DEVELOPMENT INDICATORS (WDI) FIGURES BY REGIONAL AND INCOME LEVEL GROUPING, EXCEPT FOR THE SIMPLE AVERAGE OF LICS WITH AVAILABLE DATA; 2. SIMPLE AVERAGE OF COUNTRIES WITH AVAILABLE WDI DATA.

#### Table 2

#### Financial sector efficiency and competitiveness

	Sub- Saharan Africa	East Asia and Pacific	South Asia	Latin America and Caribbean	Middle East and North Africa	Low income	Middle income	High income
Financial efficiency								
Bank cost to income ratio (%), 2017 <sup>1</sup>	61.4	51.9	49.5	58.2	49.0	58.9	54.0	65.1
Bank overhead costs to total assets (%), 2017 <sup>1</sup>	5.9	2.1	2.4	4.3	2.0	6.2	3.6	2.5
Bank return on assets (%, after tax), 2017¹	1.9	1.1	1.5	1.4	1.2	1.9	1.5	0.9
Bank return on equity (%, after tax) 2017 <sup>1</sup>	16.8	10.0	11.5	12.9	11.2	17.3	12.6	9.1
Interest rate spread (lending rate minus deposit rate, %) 2018 <sup>1</sup>	10.6	5.3	5.6	8.2	3.6	16.6	6.6	4.4
Financial competitivenes	s							
Bank concentration (%) 2017 <sup>2</sup>	66.4	58.8	53.4	67.8	71.9	70.5	61.0	70.8
H-statistic (closer to 1 implies greater competition) 2014 <sup>13</sup>	0.47	0.53	0.67	0.65	0.41	0.35	0.60	0.59

NOTES AND SOURCES: 1. SIMPLE AVERAGE OF COUNTRIES WITH AVAILABLE GLOBAL FINANCIAL DEVELOPMENT (GFD) DATA; 2. SIMPLE AVERAGE OF COUNTRIES WITH AVAILABLE WDI DATA; REFERS TO ASSETS OF THREE LARGEST COMMERCIAL BANKS AS A SHARE OF TOTAL COMMERCIAL BANKING ASSETS; 3. H-STATISTIC MEASURES THE ELASTICITY OF BANK REVENUES RELATIVE TO INPUT PRICES. UNDER PERFECT COMPETITION, AN INCREASE IN INPUT PRICES RAISES BOTH MARGINAL COSTS AND TOTAL REVENUES BY THE SAME AMOUNT, AND HENCE THE H-STATISTIC EQUALS 1 (SOURCE: GFD METADATA).

## 2. The benefits of developing interbank markets

Interbank markets enable banks to redistribute liquidity among themselves through shortterm money market instruments. At the microeconomic level, the interbank market enables banks to pool and redistribute their funds in order to manage individual excess or shortage in liquidity. Since banks are dealing with mostly uncollateralised transactions, interbank market players are expected to act prudently according to their risk assessment of counterparties, subsequently enhancing the risk management of individual banks and the interbank network, while at the same time providing market risk information input into central banks' macrofinancial surveillance.

At the macroeconomic level, the interbank market has been a key avenue of central bank interventions to influence the level of liquidity and interest rates, to induce growth according to economic fundamentals, or for purposes of financial or economic stabilisation (Summer, 2013; Green et al., 2016). However, monetary policy transmission via interbank markets may not always be effective in the context of less mature financial systems, such as in the cases of Ghana, Kenya and Zambia (Kovanen, 2011; Odour et al., 2014; IMF, 2017a). This is discussed in more depth in the next section.

Interbank markets operate through a complex network of financial links between financial institutions. They operate either through repurchase agreements – also known as repos, which are a secured form of lending – or on an unsecured basis, making the credit risk of a counterparty an essential aspect of interbank markets. Such unsecured lending can also heighten contagion risks in banking systems (Summer, 2013; Green et al., 2016).

The interbank market also contributes to financial development by providing a secondary market for participating banks. Theoretically, it can act as an insurance against liquidity shocks, enabling banks to invest in relatively illiquid assets (e.g. lending to businesses and firms) with potentially higher returns (see Bwire et al., 2019a), and improve reserve management within the banking system (Green et al., 2016).

Since short-maturity interbank market rates act as an anchor for the term structure of other interest rates in the financial system, interbank market transactions that lead to a lower risk premium can potentially spill over to a lower cost of funding charged by banks (Dinger and von Hagen, 2009; Chipili et al., 2019).

In many low-income countries (LICs), case study evidence (including the Democratic Republic of Congo, The Gambia, Uganda and Zambia) suggests that money and interbank markets are poorly developed. Since interbank markets are typically uncollateralised, the information required to assess counterparty credit risk is limited in these markets. This leads to either an absence of interbank markets or market segmentation – where a dominant player acts as a 'hub' for interbank markets, thus creating intensified credit and contagion risks and lowering liquidity (Calice and Zhou, 2018; Bai et al., 2019; Bwire et al., 2019a; 2019b). Banks respond to these factors by increasing the margins on lending and contributing to 'hoard' liquidity as an alternative way to manage their balance sheets (Angbazo, 1997; IMF, 2004a; Mishra et al., 2010; Ahokpossi, 2013; Bwire et al., 2019a; 2019b).

These inefficiencies and underdevelopment increases the cost of lending and hence act as disincentives to investment. In addition, these factors undermine the effectiveness of monetary policy because they reduce transmission through interbank markets. This adds another layer of inefficiency to the banking system and to broader macroeconomic management (Ahokpossi, 2013; Green et al., 2018). A deeper understanding of issues around country-specific market structures will aid financial authorities to identify bottlenecks and design policies that can fully harness the benefits of the interbank market—a focus of the next sections.



## 3. Progress of interbank market development in sub-Saharan Africa

There is only a limited number of empirical studies on the interbank market in sub-Saharan Africa. The first set of country-specific studies was completed under the DEGRP project for Kenya (Murinde et al., 2018; Bai et al., 2019) Uganda (Bwire et al., 2019a; 2019b), Malawi (Kanyumbu, 2019) and Zambia (Chipili et al., 2019). These studies provide the first insights into the nature of the interbank market in these sample African economies, the main microstructure aspects (mainly the price discovery process), the network topology of these markets, and the implications for monetary policy and bank management practice. In this context, this section provides a landscape of interbank market development in sub-Saharan Africa in recent decades, then presents latest evidence on the interbank market's impact on borrowing costs, banks' risk management and central banks' monetary policy transmission.

#### 3.1 State of play

Most interbank markets in sub-Saharan Africa emerged in the 1990s, and as such are in the early stages of development. In the last decade countries such as Kenya, Malawi, Uganda and Zambia were able to increase interbank activity to around 30% of GDP. However, interbank transactions remained small in other major economies such as Nigeria (1.3% of GDP), Ghana (4.8% of GDP) and Tanzania (8.4% of GDP).

Interbank market transactions are largely limited to an overnight basis. For example, interbank trading that matures overnight comprised all interbank transactions in Kenya, 95% in Malawi (Kanyambu, 2019), 90% in Uganda (Bwire et al., 2019a) and 54% in Tanzania (BoT, 2019). With the exception of Kenya, where interbank transactions are virtually uncollateralised, other African countries continue to conduct transactions on both a secured and unsecured basis. For instance, in Nigeria, the secured ('open buy back' or OBB) segment represents 96% of all interbank transactions as of 2018 (CBN, 2018); in the West African Economic and Monetary Union (WAEMU<sup>1</sup>), 93% of lending in the interbank market from 2010 to 2016 was uncollateralised (IMF, 2017b).

Central banks envision deepening interbank market activity by calibrating their monetary policy tools and putting in place the necessary infrastructure to increase the efficiency and transparency of transactions for market participants. Reforms in the early 2000s include the establishment of real-time interbank transfers, payment and settlement systems, and improving government securities markets to boost collateralised interbank trade. More recently, central banks have adopted or are currently transitioning towards implementing an inflation targeting framework that typically sets the interbank rates as the central banks' operating target. However, monetary authorities are persistently challenged by the inefficiency of segmented interbank markets and financial stability risks associated with systemically important institutions (SIIs) being the hubs of interbank development. Table 3 summarises the key characteristics of interbank markets in selected African countries. It is followed by a brief discussion of key developments in these countries' interbank markets.

These include interbank transactions that are limited to: overnight lending, the dependence of available liquidity on government deposits (thus heavy exposure to government shocks), and low interactions between banks (especially with smaller banks). There are further challenges around large banks' holding of huge liquidity (and thus, control of interbank activity), as well as information asymmetries on market participants (Odour et al., 2014). Kenya's

1 WAEMU countries are Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo.

#### Table 3

#### Summary of current development in sub-Saharan Africa interbank markets

Country	Kenya <sup>ı</sup>	Malawi <sup>2</sup>	Uganda³	Zambia <sup>4</sup>	Nigeria⁵	Tanzania <sup>6</sup>	WAEMU <sup>7</sup>	Ghana <sup>8</sup>
Starting year	2000 (informally)	2001	Late 1990s	1994 (more pronounced)	1999	1994	1993 (BCEAO <sup>2</sup> money market)	1992
Secured transactions	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Unsecured transactions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regulatory/ legislative (interbank- specific)	Present	Low	Low	Low	Present	Present	n/a	n/a
Liquidity (liquid assets to deposit and short-term liabilities ratio, 2017)	13.6%	38.3%	44.4%	41.6%	26.1%	23.5%	24.1%	30.6%
Local currency	Yes	Yes	Yes	Yes	Yes	n/a	n/a	n/a
Foreign currency	No	No (untracked)	Virtually none	No	Yes	n/a	n/a	n/a
Real time gross settlement system	Yes (2006)	Yes (2001)	Yes	Yes	Yes	Yes	Yes	Yes (2006)
Reserve or liquidity requirement maintenance period (average cycle)	Yes (1 month)	Yes (14 days)	Yes (14 days)	Yes (daily)	n/a	n/a	Yes	Yes (1 week)
Interbank trading size	Total interbank volume (2019): 2,841 billion KES or 29.2% of GDP	Daily average interbank borrowing (2019): around 7.9 billion MWK or 34.5% of GDP	Total interbank borrowing (2017): 26 trillion UGX or 34% of GDP	Total interbank money trading (2019): 83,200 million ZMW or 28% of GDP	Total interbank funds transactions (2018): 1,661.81 billion NGN or 1.3% of GDP	Total interbank cash market transactions (2018/19): 12,205.7 billion TZS or 8.4% of GDP	Average volume of transaction (2018): 276 billion XOF	Interbank placements 8.7 billion GHS (2015): or 4.8% of GDP
Other maturity profiles except overnight basis	No	Yes	Yes	Yes	Yes	Yes	Yes	N/a
Central bank liquidity facility	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Inflation targeting (IT) or IT elements (main tool: policy rate targeting market rate)	Yes (2011)	In transition to adopt interest- rate based operational framework/ inflation targeting	Yes (2011)	Yes (2012)	Yes	No (monetary target)	Yes	Yes (2007)

SOURCES: 1. ODOUR ET AL. (2014), BAI ET AL. (2019), CENTRAL BANK OF KENYA WEBSITE; 2. IMF (2019), KANYUMBU (2019), RBM (2020); 3. BWIRE ET AL. (2019A; 2019B); 4. BOZ (2020), CHIPILI ET AL. (2019); 5. INTERBANK FOREIGN EXCHANGE MARKET (SOURCE: CENTRAL BANK OF NIGERIA WEBSITE), IMF (2013); 6. BANK OF TANZANIA (BOT) WEBSITE, BOT ANNUAL REPORT 2018/2019, BOT (2011); 7. BCEAO (2018); IMF (2017B) 8. ADDISON (2001), BANK OF GHANA WEBSITE, IMF (2011), PWC (2016). LIQUID TO DEPOSIT AND ASSET RATIO FROM WDI. N/A INDICATES THAT INFORMATION IS NOT EXPLICITLY AVAILABLE OR DISAGGREGATED IN CENTRAL BANK REPORTS/WEBSITES.

2 Banque Centrale des États de l'Afrique de l'Ouest (Central Bank of West African States)

interbank market is also largely uncollateralised, which may limit access for banks with higher perceived credit risks despite having sound financial indicators, such as Tier II and III institutions and microfinanceorientated institutions.

Similar to Kenya, Tanzania's interbank market trading is also predominantly overnight unsecured transactions (IMF, 2018a). With the 10 largest commercial banks dominating savings mobilisation and credit intermediation, smalland medium-sized banks rely heavily on more expensive short-term interbank financing as well as institutional deposits.

In Malawi, annual average interbank transactions indicate that the role of the interbank market decreased in terms of percentage of GDP -47.7% in 2010 to 34.5% in 2017. Participation is limited to registered and operating commercial banks and discount houses in the country, cross-border transactions are currently not being registered and transactions are limited to Kwacha (local currency) (Kanyumbu, 2019). Due to the shallowness of the interbank market, banks prefer to transact with the central bank and their own clients (IMF, 2018b). From 2015 to 2019, daily average interbank borrowing has been smaller than the daily average amount accessed in the central bank lending facility, despite the unborrowed excess reserves in the banking system (RBM, 2020). In addition, there is heightened vulnerability to systemic shocks because of the concentration of transactions through a limited number of SII counterparties. For instance, of the 10 interbank participants, a single large bank was the exclusive counterparty to the other nine institutions in the market in the fourth quarter of 2018 (Kanyumbu, 2019). To encourage more participation in the interbank market, Malawi has been working to improve its government securities market (IMF, 2019), which may enhance the role of this instrument as a collateral for secured interbank transactions. The central bank has also recently started publishing daily liquidity forecasts to guide decisions of interbank players, and has adopted a global repurchase agreement (since the horizontal repo market is non-existent).

Similarly, in Zambia, Chipili et al. (2019) show that market segmentation in the interbank market pushes banks to rely on central bank standing facilities for adjustment funds, despite excess liquidity in the banking system. For instance, not all large banks with material deposits are active in the interbank market due to internal policies and limited credit lines for smaller banks. The same is observed in foreign banks, which may have substantial liquidity but are constrained by exposure limits dictated by parent organisations. In addition, the authors suggest that insecurity from the absence of specific laws, guidelines or codes of conduct for the interbank money market may also explain the reluctance of banks to lend to each other, and thus the persistent deviation of overnight rates from the monetary policy rate in Zambia. While secured interbank transactions should help reduce insecurity for the interbank market, the collateral currently being used are treasury bills, which are subject to downgrades by credit rating agencies. During these downgrade periods, some banks will cut credit lines because of the perceived riskiness of other banks that are holding government papers, subsequently affecting availability and pricing of liquidity.

Meanwhile, the volume of interbank transactions in Uganda has grown from Sh6 trillion (\$2.4 billion) in 2011 to Sh26 trillion (\$7.2 billion) in 2017 (Bwire et al., 2019a). However, interbank loans and other liabilities to financial institutions only comprise 1.2% of total liabilities as of 2017 (Bwire et al., 2019b), despite Uganda having the highest liquidity (as indicated by the liquid asset to deposit and short-term liabilities at 44.4%) relative to other African countries. This may be partly explained by risk associated with mainly unsecured bank loans in the Ugandan interbank market and the fact that, even when loans are secured, creditors do not have an automatic right to realise their loan authority (ibid.). To encourage banks to trade liquidity through horizontal repurchase agreements, the central bank has prepared a Master Repurchase Agreement (ibid.).

The preference for secured interbank transactions is also prominent in Nigeria. Based on the central bank's reports, the share of



secured segment in total interbank transactions increased from 72% in 2013 to 96% in 2018. This is in parallel with findings from the IMF that highlight volatile and high call rates in Nigeria's unsecured markets ranging from 3% (2008) to 30% (2013), with the interbank rate being traded above the OBB rate set by the central bank at any given day during the period (ibid.). This is a reflection of the lower confidence for uncollateralised lending among interbank market participants in Nigeria, attributed to credit-worthiness issues of participating borrowers (ibid.), but may also be exacerbated by other factors, such as an uncertain domestic and external economic environment and a tighter monetary policy stance. These factors may partly explain why the contribution of the interbank cash market to the economy remains largely untapped and limited to only 1.3% of GDP as of 2018.

# 3.2 The impact of interbank markets on borrowing costs

Potentially, a well-functioning interbank market that facilitates redistribution of funds would lower the costs of acquiring liquidity for participants. However, it is a common finding among DEGRP research and other empirical studies that ownership and size of participating banks creates market segmentation (e.g. differential price and access to funds) that limits the function of the interbank markets by lowering the cost of liquidity.

By size, Ugandan large banks which are also mostly internationally affiliated (excluding African regional banks), enjoy lower borrowing rates than their counterparts regardless of their actual financial soundness or conditions (Bwire et al., 2019a). This could be due to large banks' high liquidity and lower demand for borrowed funds, market power over small banks, and the perception that they are more likely to be recapitalised or provided with liquidity by their owners to prevent a default on the interbank market (ibid.). Meanwhile, small banks suffer from high rates irrespective of changes in their financial conditions, mainly due to the perceived risk of lending to them that are typically associated with having less funding support in the event of financial market stress (ibid.).

Meanwhile, both bank size and ownership influence the deviation in cost of borrowing among interbank participants in Zambia. Bank categories with similar ownership – such as globally owned large banks and mostly locally owned small banks – interact more with each other than those with diverse ownership (e.g. medium banks that are mainly pan-African banks) (Chipili et al., 2019). Thus, small banks tend to charge relatively lower premiums to peers than they do to medium-sized and large banks, while medium-sized banks charge higher premiums between each other (ibid.). In addition, the highest interbank lending premium observed among medium bank pairs may also be attributed to the perceived higher default risk associated with pan-African owned banks, in comparison to lending to large banks, which is dominated by foreign (global) ownership (ibid.).

In Kenya, the market segmentation emanating from the pricing behaviour of participants of a certain size is further exacerbated by the unsecured nature of interbank activity. Odour et al. (2014) find that large banks in Kenya, despite holding most of the liquidity in the market and being net borrowers in the interbank market, discriminate against smaller banks by charging them higher interest rates than their peers. The authors argue that this derives not only from the perceived high credit risk for smaller banks, but also the fact that Kenyan interbank market transactions are all uncollateralised. It is therefore not surprising that Murinde et al. (2018) observed that, in general, banks that lack widespread networks to mobilise low-cost deposits obtain funds in the unsecured interbank market at a higher cost. Similarly in the predominantly unsecured overnight Tanzanian interbank market, limited access to excess reserves by smaller banks remains a persistent challenge (IMF, 2018a).

If segmentation in the interbank market prevents relatively smaller banks from mobilising funds at lower rates, the high cost of acquiring interbank funds will translate to higher retail lending rates. While large banks that acquire interbank funds at lower costs should ideally drive down credit rates, they tend to favour funding large enterprises and government securities to minimise risk, making the trickle-down effect of lowering credit rates in the financial system more difficult. Thus, it is not surprising that the latest statistical evidence on deposit-lending rate spread remains high in sub-Saharan Africa compared to other regions (see Table 2). This somewhat echoes the empirical evidence in WAEMU countries, where the correlation between money market rates (including interbank rates) and bank lending rates remains small, heterogeneous and even negative in some countries (Imam and Kolerus, 2013).

However, there is some evidence on the potential of the interbank market to lower interest rate spreads in Zambia. Chipili et al. (2019) observe that large banks tend to charge the lowest premium compared to other bank categories. This reflects their ability to mobilise deposits at lower costs from retail markets, as well as from their advantageous access to wholesale markets through large networks of relationship banking and corporates (ibid.). Interestingly, the authors also find that large banks tend to demand higher premiums from fellow large banks compared to smaller borrowers. The lower interbank premium charged by large banks on cheap funds mobilised outside the interbank market can then benefit smaller and new entrant banks, which typically face higher costs in the deposits market (Dinger and von Hagen, 2009).

# 3.3 Impact of interbank markets on improving banks' risk management through peer monitoring

The uncollateralised nature of interbank market transactions requires participants to independently assess the financial position and risk level of counterparties. Conceptually, through this peer monitoring mechanism, a more financially sound bank can obtain more funds at a lower cost. Meanwhile, borrowing banks with higher default risks may find it more difficult to secure interbank funding and are likely to be charged unfavourable rates. DEGRP research discussed below focusing on Kenya, Uganda and Malawi provides evidence on how the presence of peer monitoring among interbank participants is associated with better financial soundness indicators of banks, although there is usually less impact for large banks that are typically perceived to be systemically important.

In Kenya, Murinde et al. (2018) establish that there is a stable inverse relationship between interbank activity up to a certain threshold and bank risk levels, controlling for other bank risk

determinants and financial crisis. This implies that the interbank market can be an effective market disciplining device, since the riskiness of a bank can be mitigated by the volume of interbank trading activity. This is in line with the findings of Tiriongo and Kanyumbu (2019), wherein both the interbank markets' price-based (e.g. interbank rates) and quantitybased (e.g. interbank transaction volumes) market disciplining mechanisms are effective in enhancing banks' capital adequacy ratios (CARs). However, Murinde et al. (2018) highlight two areas of caution. First, if banks' interbank activity exceeds a certain threshold, the impact is reversed from risk-reducing to risk-increasing, overturning the impact of peer monitoring into contagion risks. Second, size matters such that interbank activity grows for banks that become bigger (e.g. well-diversified, low-risk), but beyond a certain size, bank riskiness increases rather than decreases, suggesting that the largest banks (e.g. SII, high-risk) lie outside the peer monitoring process, potentially due to implicit government insurance to prevent bank runs.

In Uganda, Bwire et al. (2019b) find similar results, wherein banks with weaker financial soundness indicators (e.g. loan quality, profitability) are observed to be pay more to borrow in the interbank market than counterparts with stronger indicators. This implies that interbank lenders monitor the financial condition of the borrowing banks, and that interest rate spreads paid by banks can signal market perceptions of counterparty risks to supervisors. However, the authors underscore an element of 'price stickiness' in Uganda's interbank market, wherein the price a bank paid previously in the interbank market has a strong bearing on what it is likely to pay in the current period. This means that large and foreign banks that are perceived to benefit from SII status and parent bank support enjoy lower rates, while small banks that are perceived to be risky are being charged higher rates, irrespective of short-term changes in these banks' actual financial conditions.

In Nigeria, the particularly high and volatile call rate margin over the OBB (secured) rate in late 2008 partly indicated the awareness of market participants of severe counterparty risks much prior to the central bank's special audits in August 2009 (IMF, 2013).

Similarly, in Malawi Kanyumbu (2019) argues that the liquidity cost in the interbank market indicates the perceived level of counterparty risks, resulting in withholding of lending to some banks and consequently forcing these deficient banks to obtain liquidity at higher cost. This is supported by the findings of Tiriongo and Kanyumbu (2019), who find that interbank borrowing rates are: higher for banks with worse bank assets; higher for small banks that are perceived to be relatively riskier than larger counterparts; and lower for large banks that are highly capitalised. While this pricebased (i.e. interbank rate) market disciplining mechanism is effective in incentivising banks in Malawi to subsequently enhance their CARs, and hence lower bank risk, this is less effective via quantitative-based market disciplining mechanisms (i.e. interbank volume). The latter is due to the fact that borrowers in Malawi's interbank market are predominantly large banks, and that these banks have no incentives to increase their CAR (effectively lower their risk) since they can borrow larger volumes than smaller banks.

#### 3.4 Impact of interbank market on enhancing central bank policy transmission

The interbank market provides a crucial avenue for monetary policy implementation. Central banks set their policy interest rates with an aim to influence interbank market rates. Through their regulations and policy tools (such as reserve requirements, special standing facilities with higher rates, and open market operations), central banks can influence the level of liquidity and borrowing cost in the interbank market. The monetary policy influence on interbank interest rates is then subsequently expected to translate to changes in other money market interest rates, as well as banks' retail lending and deposit rates, which ultimately impact the level of prices and the real economy. However, evidence from African countries discussed below shows that less developed and shallow financial markets, incoherent central bank regulations and

an uncertain macroeconomic environment all contribute to weak monetary policy transmission via interbank market rates.

In Ghana, Kovanen (2011) finds empirical evidence that a reduction in the central bank's policy rate prompts an adjustment of comparable size in the wholesale market (interbank and treasury bill) interest rates within two months. However, he also finds that market interest rates continue their descent ('overshoot' the policy rate) in subsequent months and converge back to the policy rate within 24 months - raising questions about the effectiveness of central banks' targeting of short-term market interest rates when convergence has a considerable lag (ibid.). The author also finds that changes in the wholesale market interest rate influence banks' retail interest rates, but the process is slow and incomplete. His simulations suggest that banks' deposit and lending rates reach their lowest points, 5-6 quarters following the initial monetary policy easing. The author argues that other factors outside the monetary policy adjustment process are at play. For instance, in November 2009, the central bank eased monetary policy which led to sharp declines in treasury bill rates and interbank market rates, but retail lending rates remained high. The author suggests that banks' unwillingness to lower lending rates may be partly explained by their higher provisioning for bad loans in 2009 amid Ghana's fragile macroeconomic stability. Since there were funding costs associated with maintaining such high buffers, the costs were translated to high lending rates.

In Kenya, Odour et al. (2014) finds that, while monetary policy rates influence interbank market rates in the long-run, there is a disconnect between the two rates in the short-term, particularly in periods of liquidity shocks. The authors argue that the effectiveness of monetary policy transmission is impeded by segmentation in the interbank market, particularly when small banks with liquidity shortages could not borrow from large banks in times of liquidity gridlock, potentially due to the uncollateralised nature of the Kenyan interbank market and the perceived high risk of small banks. Significant divergence between policy rates and interbank rates in Kenya in the past was also observed when the central bank suspended standing facilities each time there was foreign exchange rate pressure (to encourage banks that need liquidity to sell foreign assets) (IMF, 2015) and when lending interest rate controls were in place (IMF, 2018c). The significant volatility in interbank interest rates following the uncertain policy environment encourages banks to retain excess liquidity, creating adverse effects on bank lending (especially to small and medium-sized enterprises) and therefore weakens the monetary policy transmission mechanism (ibid.).

In Zambia, the interbank market rate has been above the central bank's policy rate for around 80% of the time since 2012, despite high liquidity in the system (IMF, 2017a). The deviation between the policy and interbank market rates was attributed to heightened policy uncertainty<sup>3</sup>, which encourages banks to maintain high precautionary liquidity, reducing their ability to extend credit, thus increasing costs (ibid.). The higher costs might have influenced the higher lending rates from overnight interbank interest rate in Zambia, undermining the role of interest rates pass-through to the economy. However, in certain circumstances such as in 2015, following sharp depreciation of the Kwacha, the central bank took deliberate policy action that led interbank rates to rise above the upper corridor of the policy rate in order to support the foreign exchange market. The main reason for prioritising foreign exchange stabilisation is the high pass-through effect of foreign exchange to both food and non-food prices, highlighting the challenges faced by policy-makers in striking a balance when implementing policies that have repercussions to different segments of the financial and real economy.

Meanwhile in Malawi, recent evidence presented by Kanyumbu (unpublished paper, 2020)

Policy uncertainty such as the central bank's poor liquidity management, heterodox reaction in periods of stress, frequent changes in discount window access, and high statutory reserves with short averaging period (IMF, 2017a).

suggests that the level of liquidity (which is influenced by the central bank) has a significant and negative relationship with the interbank market rate, while the interbank market rate is significantly and positively associated with lending rates. The findings indicate that there is significant monetary policy transmission via interbank markets, particularly on influencing banks' pricing of loans. However, the preliminary results also suggest that the models have low explanatory power (measured by R-squared), suggesting the need to further investigate other factors that influence interbank and lending rates in Malawi.



# 4. Barriers impeding further development of interbank markets

#### 4.1 Scale of the interbank market

Sufficient liquidity is needed for the interbank market to function effectively. Otherwise, a small or highly concentrated interbank market may not allow all borrowers to have a perfectly elastic supply curve for interbank funds (Bwire et al., 2019b). An increase in demand for interbank liquidity by an individual bank might be large enough to increase the interbank interest rate (ibid.), defeating the purpose of acquiring funds at lower cost via the interbank market. In Kenya, for example, the significant day-to-day volatility in interbank market rates in 2017 to early 2018 appears to have been partly driven by the small number of large banks dominating the market (IMF, 2018c).

In African countries, banks typically rely on customer deposits for funds and interbank transactions are relatively small. Interbank borrowing between locally owned banks operating domestically alone, expressed in interbank deposits to total asset ratio, are relatively low in many African countries. Ratios range from 6.8% in Tanzania, 5% in Kenya, 5.1% in Nigeria, 3.4% in Ghana, and 2.3% in Ethiopia to 1.6% in Libya. However, in more mature African markets, this ratio is up to 23.9% in Côte d'Ivoire, 22.8% in South Africa and 13.3% in Senegal, comparable or exceeding other emerging economies such as Viet Nam (22.2%), China (10.7%) and Russia (9.8%) (Allen et al., 2020). However, the benefits of substantially increasing the volume of interbank activity of individual banks are debatable. Murinde et al. (2018) provide evidence that if a bank increases its interbank position up to a certain threshold, bank risks increase due to a possible contagion effect.

#### 4.2 Market segmentation

Empirical papers on interbank markets in sub-Saharan African countries consistently indicate segmentation in the interbank market. Assessment of credit risks, asymmetric information and other factors independent of financial soundness (e.g. SII status, perceived high-risk small banks, lender–borrower relationships) associated with certain bank characteristics (e.g. size, ownership) affect the segmentation of access, volume and price of liquidity in the interbank market.

By access, small and medium banks tend to borrow more compared to large banks in Uganda and Zambia, reflecting the larger deposit base of the latter, which enables them to be the main supplier of interbank liquidity (Bwire et al., 2019b; Chipili et al., 2019). Conversely, in Kenya, small banks tend to lend more to medium and large banks than they borrow from said banks, suggesting the presence of a high-risk perception for smaller banks, especially over uncollateralised transactions (Odour et al., 2014). The same can be observed in Tanzania, where smaller banks have limited access to the interbank market despite the excess liquidity in the system that tends to be hoarded by other banks (IMF, 2018a).

By price, large banks can typically borrow at lower interest rates, either because of their market power or degree of insurance (e.g. SII status, parent bank support), and at times independent of these banks' actual financial soundness indicators. In Kenya, large banks hold most of the liquidity and thus control activity in the interbank market, to the extent of discriminating against smaller banks by charging them higher interest rates than they charge fellow large banks (Odour et al., 2014). Thus, it is not surprising that interbank interest rates do not converge across bank sizes (ibid.). A similar case is true in Uganda and Malawi, where large banks obtain lower borrowing costs than their smaller counterparts (Bwire et al., 2019b; Kanyumbu, 2019). For instance, Ugandan small banks pay up to 2% more than large banks (Bwire et al., 2019b).

In contrast with evidence from other African countries, Chipili et al. (2019) find that lending by small banks to large banks is typically at a higher premium in Zambia. In addition, the authors' empirical estimates suggest that there is an overall long-range dependence (hysteresis) in interbank lending rates in that country, indicating the absence of price segmentation in the interbank market (ibid.). However, the authors also highlight that there is intragroup price segmentation within larger and medium-sized banks. In addition, interbank market pricing behaviour tends to be altered by monetary policy actions, especially during episodes of policy tightening.

Ownership also contributes to segmentation in African countries' interbank trading. In Zambia, banks with similar or related ownership tend to have more interactions with each other as opposed to bank categories with diverse ownership (ibid.). For instance, the intense intra-trading within small and large banks reflects the largely locally owned small banks and foreign (globally) owned large banks, respectively. In Kenya, Odour et al. (2014) argue that banks with relationships at ownership levels (e.g. among foreign, local private or local public) would have open credit lines even if their asset bases are not strong enough. These credit lines establish lending and borrowing limits for other banks, both in terms of whether the bank can actually trade or not, and at what volumes. In the wider WAEMU, intra-group transactions represent 80% of interbank transactions since large international banks recycle their excess liquidity only within the group, resulting in higher interest rates charged for inter-group unsecured interbank transactions (IMF, 2017b). This is likely to change in the next decade with the rapid rise of pan-African banks, and the emerging evidence on these regional banks' impact on increasing competition (see Kanga et al., 2018) and more active participation in the interbank market (IMF, 2017b).

Another significant market friction related to ownership is the internal policies of large and foreign banks. In the case of Uganda, international banks' credit limits are reported to be opaquely imposed by parent banks, restricting these banks' offloading of surplus liquidity to qualified borrowing banks at rates lower than the prevailing interbank market rate (Bwire et al., 2019a; 2019b). This means that, banks that do not qualify or cannot adhere to these credit limits, are forced to borrow from a sub-set of banks at higher rates than would be the case in the absence of this market friction (ibid.). Similarly, in Zambia, Chipili et al. (2019) reported that not all large banks with typically substantial deposits are active in the interbank market, largely due to internal policies. Also, foreign banks in Zambia tend to trade more with each other, partly because Zambia is dominated by foreign banks that are more cautious about which banks they extend their credit lines to. Consequently, even if there is ample liquidity in the market, interbank rates remain high and other banks still encounter difficulty in accessing liquidity.

# 5. Financial contagion risks surrounding interbank market networks

In normal times, a well-functioning interbank market contributes to enhanced liquidity allocation and effective risk sharing (Bai et al., 2019). However, the literature suggests that the interbank network can be a direct channel of financial contagion in times of unforeseen liquidity shocks, as banks withdraw their deposits and 'fire sell' their long-term assets to meet liquidity demands. This deflates the value of these assets and further depresses bank capacity to pay creditors, leading to insolvency of some or many banks, heightening credit risk in the interbank market as a whole, and eventually creating a 'vicious cycle' of bank failure in the interbank system (ibid.). Indirectly, the interbank market can amplify contagion following a large financial shock by increasing lending rates across the board, self-fulfilling market expectations of potential systemic failures and liquidity hoarding, which may all cause illiquid but solvent banks to go bankrupt (ibid.).

Since the global financial crisis in 2008, more research has emerged on the network analysis approach for the financial sector, in order to examine contagion effects. The key objective is to map out different interbank network structures and identify how these structures influence bank behaviour and create contagion risks during periods of market stress. Possible characteristics of network structures include:

- complete (or incomplete), wherein all banks are symmetrically connected (or not completely connected) to each other;
- 2. core–periphery structure, wherein there are very few banks ('core', 'hubs' or 'money centres') with many interbank connections, and many banks ('periphery' or 'spoke') with only a few links. The core banks typically act as intermediaries for the periphery banks; and
- **3. clustering**, referring to the higher probability that neighbouring banks connected to a node bank are also connected to each other.

All else being equal, a complete network implies faster transfer of liquidity from those with excess funds to the distressed member, contributing to the resiliency of the interbank system in times of stress. The most common feature among the limited country studies on interbank networks in Africa highlight an incomplete structure of the interbank system, largely stemming from market segmentation.

During the collapse of Lehman Brothers in September 2007, Bai et al. (2019) observed that the core–periphery structure intensified in Kenyan interbank markets. During this period of market stress, the large, local and listed banks became overrepresented in the core. For instance, during the pre-crisis period, 24% of large banks were in the core; during the crisis, this increased to 82%.

The authors also attempted to estimate the magnitude of banks' contagion risk depending on the banks' position in the network and the transactions (i.e. lending and/or borrowing) between them. Banks within the core that are directly connected to all other banks are classified with a 'high contagion risk component', and these banks significantly increased in number during the financial crisis. Within this high contagion risk component, it is the large, foreign and listed banks that become net borrowers from their counterparts (i.e. smaller, domestic and private banks) during crisis periods.

In Malawi, Kanyumbu (2019) argues that the relatively high level of clustering among participating banks increases the vulnerability of the interbank market to contagion. This is consistent with Kenya's experience, wherein clustering significantly increased during crisis periods in all bank groups, with a relatively higher probability of clustering among large, foreign and listed banks (Bai et al., 2019).

Other analyses also reflect the vulnerabilities to contagion risk of the interbank system due to a



highly concentrated banking system. In Kenya, Odour et al. (2014) established that if a shock hits one of the six large banks that act as money centres (similar to core), the ripple effects are felt by the entire interbank market. While studying episodes of banking sector liquidity gridlock in Kenya between 2006 to 2012, the authors observed that liquidity was not redistributed from surplus to deficit banks. For instance, during the Safaricom initial public offering in March-May 2008, small banks found themselves with liquidity shortages and yet they could not borrow from large banks (ibid.). Consequently, the Kenyan central bank had to withdraw liquidity from receiving banks and inject the same to those with liquidity shortages (ibid.).

Related to this, Bai (unpublished working draft, 2020) is currently looking at the impact of liquidity shocks (e.g. IPOs, post-election, global financial crises) on liquidity flows. Her preliminary results based on time series data suggest that, among different types of liquidity shocks, external financial crises have the largest impact on liquidity flows in interbank markets. In Tanzania, a stress test and contagion analysis show that interbank exposure exacerbate systemwide vulnerabilities (IMF, 2018a). For example, in the event that nine banks defaulted, knock-on effects would be triggered on other banks, with five additional banks ending up with negative capital and an additional bank becoming undercapitalised (ibid).

### 6. Policy implications and new approaches

#### 6.1 Deepening the interbank market

The interbank market is a foundation for developing the money market as a whole and provides a base for determining long-term financing rates (such as mortgages and investments). Thus, developing and deepening the interbank market is essential to achieving price discovery and yield curve development for the financial system and the economy. However, due to the bottlenecks in African interbank markets identified above, a more proactive approach is warranted to encourage more market participants and greater interbank transactions for the deepening of interbank markets.

A broad requirement to support market-driven deepening of the interbank market is to strengthen macroeconomic fundamentals. These reduce fundamental risk premiums, increase demand for investment financing, and attract broader participation of bank and non-bank institutions – all of which will pave the way for price discovery and the development of other transactions of different tenors in the interbank market.

Also key to promoting competition is preventing a market structure with a monopoly or oligopoly in order to discourage pricing above prevailing rates (IMF, 2004b). Thus, removing entry barriers to broaden and extend participation (e.g. increasing participation of non-banks) can potentially help reduce market segmentation and therefore increase the efficiency of the interbank market.

More specific policy approaches might include the following:

1. **Improving market infrastructure.** Experiences from emerging market economies suggest improvements in underlying market infrastructure (such as trading platforms, custody, and clearing and settlement systems) contribute to the development of interbank and money markets (Schipke, 2015). For instance, efficient payment settlement systems ensure that interbank transactions are recorded, honoured and settled accurately and in a timely manner (IMF, 2004b), and that participating banks are aware of their position with the central banks. Enhancing trading platforms can also provide reliable and transparent information that can partly address the information asymmetry that limits interbank transactions.

- 2. Mitigating credit risk (actual or perceived). In the short term, facilitating collateralised interbank transactions (such as by using government securities) can potentially boost trading in an interbank market where there is limited trust between participants (ibid.). This also means that the market for underlying collateral, such as government securities markets, should also be developed (ibid.). However, monetary authorities understand the challenges to using government securities as a collateral, since this instrument is also highly sensitive to changes in credit ratings, which can contribute to the volatility of interbank rates. One policy option for donors is to provide guarantees in the interbank market for lowertier institutions and non-banking institutions. For example, Frontclear is a recent, highly innovative, donor seed-funded example of such a policy intervention (Box 2). However, the longterm solution would be to improve the financial soundness of interbank market participants, particularly by dealing with fundamental problems such as non-performing loans and poorly diversified credit portfolios (ibid.).
- 3. Central banks can also take specific policy and instrument approaches to encourage interbank market development. These include:
  - Central bank liquidity facilities. The availability of standing facilities will give confidence to interbank market participants that they have a 'lender of last resort' if they run short of liquidity, or where they can deposit excess funds by the end of reserve requirement maintenance periods. However, regulators should ensure that the standing facilities are not systematically meeting bank

requests that prevent them from engaging in interbank trading (ibid.). For instance, central banks can formulate policies to discourage or penalise short-term borrowing from central banks in order to encourage interbank trading among participants.

• Reserve requirements. Banks have to maintain a certain level of reserves at the central bank over a maintenance period. If some banks fall short of reserve balances by the end of the maintenance period, and central banks impose higher borrowing rate in its lending facility, these banks will be encouraged to borrow available funds from the interbank market. A shorter maintenance period may induce more frequent and regular interbank market trading in order for banks to secure the reserves they need (see IMF and World Bank, 2001).

# Box 2 Frontclear – a new policy approach to interbank credit

Frontclear is a development finance company that connects banks from emerging markets and developing countries to global interbank markets by providing credit guarantees to transacting institutions' counterparty credit risk in repo, derivative and securities lending transactions, on the condition that local currency assets can be used for collateral management purposes. This mechanism not only increases liquidity and participation in the interbank markets, but also further utilises and develops local currency markets. Frontclear can guarantee up to 100% exposure and can pay the early termination amount upon close out and failure to pay by the obligor and be a buyer of eligible collateral (e.g. government bills, bonds and cash) in the close out process. The guarantee is Basel III-compliant, allowing beneficiary institutions to overcome credit, country or institutional limits to transact with emerging and frontier markets and to offer their clients more attractive trading terms.

SOURCE: FRONTCLEAR WEBSITE (WWW.FRONTCLEAR.COM/).

• Interest rates. Interbank market rates can be allowed to fluctuate within a policy rate corridor that would result from the interest rate spread between a deposit standing facility and a refinance standing facility (see IMF, 2004b; Mæhle, 2020). This will provide an incentive for banks to deal with each other in the interbank market rather than with the central bank (IMF, 2004b).

# 6.2 Managing contagion risks in a segmented interbank market

Based on discussions above, it is a common feature among African countries to have large banks that dominate transactions, and drive price and volume segmentation (against smaller banks) in the interbank market. Most of these banks, through their size and ownership, have advantageous access and are more connected to wholesale and cross-border funding that they could offer to domestic interbank markets, making such banks channels of systemic risks in times of both domestic and external (global and African region) financial shocks.

The first line of defence to preserve financial stability is to enhance central banks' macrofinancial surveillance efforts and micro-prudential supervision of interbank market participants. This will enhance the capacity of regulators to identify high risk-taking behaviour and detect early warning signs from SIIs' interbank market activities, enabling regulators to provide a precautionary rather than reactive policy response.

Much recent discussion includes the need to put in place appropriate micro-prudential regulations in Africa. Based on a regression analysis using data for 49 countries, caps on loan-to-value and debt-to-income ratios, ceilings on credit or credit growth, reserve requirements, countercyclical capital requirements, and time-varying/dynamic provisioning all help to dampen procyclicality (or a tendency to amplify a business cycle that creates systemic vulnerabilities) (Lim et al., 2011). However, as in many LICs, development of macro-prudential measures will be challenged by limited data availability, weak supervisory capacity and volatile economic conditions, such that simple rules-based approaches may be preferred to increase resilience to systemic shocks (IMF, 2014; Jones and Zeitz, 2017; Jones, Woods and Beck, 2018).

For one, there is a case for a measure to maintain relatively high capital requirements or buffers for LICs, taking into account country-specific risks, backed by evidence from the literature where long-run costs (e.g. higher credit cost, lower output) of such measures are small compared to short-run adjustment costs (e.g. banks not adjusting to higher capital requirements without cutting their exposure) (IMF, 2014). Such high capital requirements should be reduced if systemic risks materialise to allow the system to absorb losses in the event of a shock (ibid.).

Maintaining high liquidity buffers is also recommended for LICs, especially where an effective deposit insurance scheme is limited (ibid.). This is especially relevant to LICs where large deposit redemptions due to confidence shocks are commonly observed (ibid.), which may potentially impact the volatility in interbank markets especially if the deposit withdrawals are from the core banks. In addition, Corrado and Schuler (2017) find that stricter liquidity measures (rather than capital requirements) reduce the impact of the breakdown in interbank lending on the real and financial sector. Meanwhile, without increasing the aggregate burden of regulation, Aldasoro and Faia's (2016) simulations suggest skewing liquidity requirements towards systemically important banks can reduce systemic risk (in terms of bank default) even when requirements for less important banks are relaxed. This is consistent with IMF's (2014) suggestion to include a requirement for greater loss absorbency for the largest institutions, given their high share of lending and important functions in the domestic financial system.

With increasing presence of pan-African banks in sub-Saharan Africa<sup>4</sup>, having a regional financial stability committee, cross-border information sharing and regional cooperation on macroprudential policies could be appropriate. Such cooperation could be done through memoranda of agreements between home and host countries, for example between the central banks of Nigeria and West Africa (ibid.).

The experiences of Kenya and Nigeria, as discussed above, highlight the reluctance of banks to extend liquidity to deficit banks or to hold high levels of precautionary liquidity. Due to segmented markets, small banks suffer the most either through higher interest rates charged to them, or complete inaccessibility to interbank markets. However, in both cases, the redistribution of interbank funds resumed when the central banks stepped in, either through intermediation or providing guarantees to encourage interbank trading. Thus, it seems that a segmented interbank market may still function during periods of liquidity if transactions are relatively secured, warranting central banks to come up with innovative ways and partnerships with the private sector to boost the collateralised interbank market.

# 6.3 Creating space for market discipline in the interbank market

The cases of Kenya and Malawi provide evidence that the interbank market can be an effective device in mitigating the riskiness of a bank (Murinde et al., 2018; Tiriongo and Kanyumbu, 2019) and improving its capitalisation (Tiriongo and Kanyumbu, 2019). This has important implications since some countries in sub-Saharan Africa are discussing transition towards Basel III implementation, which will include addressing systemic risks through higher and more qualified capital requirements (see te Velde, 2019). If banks on their own generally attempt to improve their risk profile (partly by enhancing capitalisation) in order to access interbank funds, then, as Murinde et al. (2018: 26) put it, this will enable the Central Bank of Kenya to potentially 'side-step the "one size fits all" element of Basel III regulations'. This resonates with Tiriongo and Kanyumbu's (2019) conclusion regarding the significant role of the interbank borrowing rate (market disciplining device) in increasing Kenyan and Malawi banks'

<sup>4</sup> For example, around 30% of pan-African banks' operations have a deposit share exceeding one-quarter of total banking deposits in the respective host countries (IMF, 2014).

capital adequacy ratios to provide support to existing prudential regulation on adequate bank capitalisation.

More generally, to help banks monitor each other and enhance their role in facilitating market discipline in support of regulatory supervision, there is a need to promote higher frequency disclosure (mandatory, via moral suasion or voluntary) of banks' interbank positions, financial conditions, and liquidity and risk management. Based on cross-country evidence (Nier and Baumann, 2003), higher disclosure can significantly strengthen the effect of market discipline in helping to build a capital buffer for banks. This is even more important for banks with a high probability of default or that are approaching insolvency.

Meanwhile, as seen in Kenya and Malawi, the market-disciplining effect of the interbank market can be less effective for the largest banks (and foreign, public and older banks in Kenya), especially when they are borrowers in the market (Murinde et al., 2018; Tiriongo and Kanyumbu, 2019). Additionally, beyond a certain point, higher interbank exposure and bank size increases bank risks and hence potential contagion risk (Murinde et al., 2018). Thus, it seems that financial regulators must be sceptical in using the usual market-disciplining indicators from the interbank market for systematically important banks that are typically large and foreign-owned, since the entrenched pricing and access advantages and implicit government safety net for such institutions under segmented markets suggest that they fall outside the peer monitoring role of the interbank market. This challenge is not exclusive to sub-Saharan African

countries, since cross-country evidence also suggests that the beneficial effects of market discipline are likely to be weaker for banks that enjoy implicit guarantees from government (Nier and Baumann, 2006).

Therefore, another policy approach to create space for more effective market discipline mechanisms is to enhance the competitive environment among interbank players. For instance, Tiriongo and Kanyumbu (2019) find that, while both price- and quantity-based mechanisms are effective in Kenya, only the former is effective in Malawi. The authors suggest this is due to the fact that, compared to Malawi, Kenya has better competitive features with more active interbank players that are linked to global markets, have more accessible information and do not enjoy the same assurance of Malawi's government support in the event of failure. However, striking a balance is always key, since fierce competition may also increase risktaking incentives, which can threaten financial stability and thus will call for even more effective market discipline tools to curb these incentives (Nier and Baumann, 2006).

While there is cross-country evidence that a higher share of uninsured funding has a disciplining effect (ibid.), earlier discussion points to the challenges of highly unsecured interbank transactions in the context of African countries that may have been imposing disincentives for interbank participants to trade, curtailing interbank market development more generally. Thus, a careful balance is needed from regulators in facilitating the development of secured interbank markets, but not in an excessive way for banks to discount counterparty risks that can weaken the banks' role in market discipline.

### 7. Conclusions

As discussed, the financial sector enables economic growth by translating savings into investments in the real economy. Despite the notable progress made in terms of financial liberalisation and financial inclusion in many sub-Saharan African countries, the banking sector continues to suffer from a lack of competition, high borrowing costs, low levels of credit and a concentration of bank funding in the extractive sector.

These gaps can be alleviated by well-functioning interbank markets, which can efficiently redistribute excess liquidity within the banking system, improve price discovery, encourage competition, lower costs of bank fund acquisition and ultimately translate to lower interest rates in the real economy.

However, data and empirical evidence from sub-Saharan African countries suggest the development of efficient interbank markets are being challenged by two overarching factors: market segmentation and persistent high levels of risk perception.

Market segmentation results from the market power of large banks and association of high risks with smaller banks, regardless of these banks' actual financial condition. This affects the latter category in terms of costs and access to interbank funds, and to some extent, limitations to the peer monitoring role of the interbank market participants.

In countries where foreign banks are dominant, they can have opaque exposure and credit limit policies that create further price distortion in the interbank market. These internal policies constrain smaller banks' access to funds, despite overall excess reserves in the banking system. Further, this makes it more difficult for regulators to rely on interbank market interest rates for gauging the true level of liquidity in the financial system, impeding the effectiveness of central bank intervention and monetary policy transmission. The persistent high levels of risk perception result from the low level of market confidence emanating from either or both information asymmetry and 'price stickiness', compounded by the structural risks associated with an underdeveloped financial market (e.g. lack of financial infrastructure, underdeveloped collateral markets, undiversified participants, absence of resolution frameworks and so forth). This partially explains the generally low levels of interbank engagements in sub-Saharan Africa, the underdevelopment of other maturity profiles outside overnight transactions and the preference for secured markets. These high levels of perceived risk, combined with the role of networks and banking relationships, can be heightened in times of market stress.

This is especially evident during liquidity shocks. For example, during such episodes in Kenya and Nigeria, interbank market rates became highly volatile and, in some instances, interbank operations virtually shut down until some form of intermediation and guarantees from a central bank were put in place.

The resulting barriers from these two main constraints continue to limit the potential role of the interbank market in increasing the efficiency of sub-Saharan Africa's banking sector, and consequently enabling growth and structural transformation in the region.

Moving forward, there are multiple ways regulators can encourage deepening of the interbank markets. These include promoting competition by encouraging wider participation in the interbank market from bank and non-bank financial institutions, developing collateral markets and interbank trading instruments of different tenors, improving market infrastructure, enhancing transparency and frequency of information disclosure, and tailoring central bank policy tools (e.g. liquidity facility rates, reserve requirement cycle periods, interest rate corridors) to guide interbank interest rates.

#### Box 3: Priorities for future research into interbank markets

Further research and policy development are needed. Based on the existing literature, including DEGRP research and views of DEGRP researchers on interbank markets, addressing the following research gaps could further provide useful insights:

#### a) Developing interbank markets

- Landscaping study comparing interbank market development across African countries.
- Best practices among African countries on: developing different maturity profiles in the interbank market, codes of conduct, and guided rules for interbank transactions. Also, other related facilitation or regulatory policies that have been implemented and have successfully encouraged interbank engagements among participants.
- Impact of disclosure and credit guarantee schemes on banks' access to engagement in interbank markets.

#### b) Impact of interbank markets on improving the financial sector and real economy

- Empirical study to establish how interbank markets directly influence development of wider money markets.
- Delineation of the impact of market discipline mechanisms from the impact of central bank regulation on reducing bank risks and/or improving capitalisation.
- Establishing the impact of monetary policy (via interbank markets) on the informal financial sector.
- Impact of microstructures and trading behaviour (e.g. internal credit/exposure limits of foreign and large banks) on interbank market rates, liquidity management and effectiveness of monetary policy transmission.

#### c) Financial contagion risks

- Developing methodologies to test financial contagion risks via interbank markets, in the context of African economies at early stages of development of financial markets.
- Impact of cross-border interbank networks on banking risks and regional contagion.
- Magnitude of financial contagion that can be channelled through interbank markets according to the type of financial stress (e.g. domestic liquidity shock, global and regional financial crises, epidemic/pandemic-induced financial volatility).
- Links between interbank markets, foreign exchange markets and inflation, as well as appropriate central bank policies and interventions in such contexts in times of stress.
- Quantifying the impact of relationships and 'trust' to gather insights on the characteristics of banks that have easier access to liquidity in times of financial shocks.
- Policy options to balance objectives of developing an efficient interbank market and accompanying prudential regulations to limit financial contagion risks.

Central banks can also support the private sector (e.g. Frontclear) and development banks in crafting guarantee schemes and collateral instruments to further encourage interbank transactions at least in secured markets.

However, the experience of the global financial crisis in 2008, together with the increasing role of pan-African banks, indicates a need for regulators to strike a balance between deepening the interbank markets and mitigating potential contagion risks that can emanate from increasingly connected bank networks. In Kenya and Tanzania, simulation exercises suggest that if a few major banks experience a liquidity shock, the knock-on effects will be felt by the wider interbank system.

Enhancing the coverage and frequency of information disclosure as well as creating a space for interbank markets to play their market disciplining role in discouraging risk-taking can help promote financial stability of participating banks. However, complementary regulatory policies (e.g. capital and liquidity buffer requirements) need to be tailored according to the national interbank market's characteristics (e.g. market dominance or segmentation by bank size and ownership) and bank behaviour in times of stress (e.g. tailored macro-prudential policies to minimise risks from systemically important banks) in each interbank market.

This stresses the importance of actively investigating the characteristics of the interbank markets in the wider sub-Saharan African context at both country and regional level, including the research gaps outlined above. However, robust results can only be achieved by using comprehensive bank-level data which is extremely limited and only available to central banks. This highlights the need for continued collaboration between central bank researchers and academics in order to conduct bank-level studies with findings that will ultimately benefit financial regulators in the region.

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