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## Digitalisation and its impact on SME finance in Sub-Saharan Africa: Reviewing the hype and actual developments

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Deutsches Institut für  
Entwicklungspolitik



German Development  
Institute

Discussion Paper

4/2020

# Digitalisation and its Impact on SME Finance in Sub-Saharan Africa:

## Reviewing the Hype and Actual Developments

*Sabrina Disse*  
*Christoph Sommer*

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Sub-Saharan Africa:

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Sabrina Disse

Christoph Sommer

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## Preface

This Discussion Paper is part of DIE's research project "Preconditions for Sustainable Development: Social Cohesion in Africa". Social cohesion – or social solidarity – within societies is a key success factor for sustainable development in Africa. However, social cohesion is also particularly under pressure in societies in Africa and other world regions. The DIE team aims to identify patterns of social cohesion in Africa, analyses factors that influence the degree of social cohesion (or its absence) and identifies domestic and international policies that contribute to the creation and consolidation of social cohesion. The team addresses five issue areas:

1. Measuring social cohesion in African societies across countries;
2. effects of tax systems and social policy on strengthening social cohesion in Africa;
3. interdependence of financial systems design (small and medium-sized enterprises) and social cohesion;
4. relevance of values, democracy and political institutions for social cohesion; and
5. influence of external peacebuilding, political institutions and individual attitudes on societal peace and social cohesion.

In this Discussion Paper, the authors address the opportunities and challenges for SME financing associated with digitalisation. The authors assess the current state of digitalisation in Africa's financial sector, before taking a closer look at the performance of mobile money, crowdfunding and SME stock exchanges. This analysis builds a basis for further research on social cohesion.

In addition, it addresses digitalisation, one of the main drivers of societal change anywhere in the world. In particular, digital technologies are expected to have a huge impact on developing countries' prospects for economic development. Digitisation will revolutionise business transactions in many ways: Digital technologies may help provide real-time information to farmers in remote areas; they enable poor people to use mobile banking services and financial services; they allow workers in remote locations to do contractual work for international customers and small firms to access export markets. Generally, these technologies reduce transaction costs, and they may be used to make economic transactions more transparent, reduce the scope for corruption and hold public service providers accountable. At the same time, digitisation enables automation at an unprecedented scale, thereby making millions of routine jobs redundant, and it enables the emergence of oligopolistic platform economies, some of which have led to an unprecedented accumulation of wealth among the super-rich and undermined welfare-oriented societal regulation.

Policymakers thus need to understand the opportunities and threats emerging from the wide range of digital innovations to be able to accelerate and broaden their beneficial effects while ensuring smart regulations to minimise the adverse impacts in order to foster both economic development and social cohesion.

The German Development Institute / Deutsches Institut für Entwicklungspolitik (DIE) explores some of these impacts on economic development prospects of latecomer

economies, especially in Africa. Several DIE Discussion Papers have been published in the past two years which look at various dimensions of digitalisation. For more information go to <https://www.die-gdi.de/digitalisierung/>.

Moreover, we hope that DIE research will help to better understand the drivers of social cohesion and to formulate policies that contribute to cohesive societies worldwide.

Bonn, 05 February 2020

Julia Leininger

Programme Director

“Transformation of political (dis-)order” and co-lead  
of the research project “Social Cohesion in Africa”

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## Abbreviations

ACfA	African Crowdfunding Association
AFI	Alliance for Financial Inclusion
ASEA	African Securities Exchanges Association
CAGR	compound annual growth rate
CCAF	Cambridge Centre for Alternative Finance
EIB	European Investment Bank
FinTech	financial technology
FSD Africa	Financial Sector Deepening Africa
GDP	gross domestic product
GSMA	GSM Association
HIC	high-income country
IFC	International Finance Corporation
ILO	International Labour Organization
IPO	initial public offering
LIC	low-income country
LMICs	low- and middle-income countries
MNO	mobile network operator
MSMEs	micro, small and medium-sized enterprises
OECD	Organisation for Economic Co-operation and Development
P2P	peer-to-peer
SMEs	small and medium-sized enterprises
SSA	Sub-Saharan Africa
WFE	World Federation of Exchanges

## Executive summary

Small and medium-sized enterprises (SMEs) are pivotal for inclusive economic development, but suffer disproportionately from institutional and market failures, especially from constrained access to external finance. Digitalisation of the financial industry is often seen as a game changer. This paper aims to answer the question what the role is of digital financial instruments in SME finance in Sub-Saharan Africa (SSA). It discusses the opportunities and challenges of digital advances for SME finance in general and of three specific financing instruments in Sub-Saharan Africa, namely mobile money (including digital credits), crowdfunding (including peer-to-peer lending) and public equity, in order to contrast the hype around digital finance with actual market developments and trends.

Over 90 per cent of firms are small and medium-sized enterprises employing more than half of the formal workforce worldwide and more than 60 per cent in low- and middle-income countries (LMICs). SMEs also account for most of the new jobs created (or at least as much as larger firms). They create economic opportunities such as employment, skill development and upward mobility in diverse geographic areas and economic sectors, and provide a livelihood and income for diverse segments of the labour force, including low-skilled workers as well as disadvantaged and marginalised groups such as young people, women and minorities. Hence, SMEs can foster inclusive economic development and subsequently contribute to social cohesion. A substantial share of national value added is attributed to SMEs and the SME segment is strongly and positively associated with economic growth (even though no causality can be claimed in this respect) and economic diversification. SMEs are also vital for advances in productivity and innovation, as small and young firms may introduce new, efficient technologies or – especially important for LMICs – make small modifications in order to adapt innovations to the local or national contexts or benefit from knowledge spillover. In short, SMEs play a crucial role for economic development.

However, SMEs cannot fulfil their full potential, since institutional and market failures, most importantly the constrained access to finance, disproportionately affect smaller firms. Owners and managers of SMEs rank access to finance as the most binding constraint to growing their business and cross-country analyses underline that smaller and younger firms are more likely to be excluded from external finance. Consequently, almost half of the formal enterprises in LMICs are unserved or underserved, which amounts to a financing gap of USD 2.1-2.6 trillion for SMEs, corresponding to 30-36 per cent of outstanding SME credits in these countries. The severity of the problem varies across regions and is particularly high in Sub-Saharan Africa where the financing gap amounts to more than three times the outstanding SME credits.

The financing gap stems from several market failures that lead to market imperfections and inefficiencies, that is SME financing below the equilibrium level that would emerge in competitive capital markets with complete and costless contracts, no private information and rational expectations. Moral hazard and adverse selection result in distortions in financial markets such that particularly smaller firms become excluded from external finance due to their opaqueness: conventional financial institutions find it hard to lend to smaller firms that cannot provide financial statements, a credit history or credit bureau information, nor adequate collateral in the form of land and buildings. Moreover, transaction costs in credit assessment and subsequent processing and monitoring of loans constitute more or less fixed costs such that smaller loans are more cost-intensive per dollar lent. In short, many financial institutions shy away from SME lending due to the risks and costs

involved. This is augmented by challenges related to potential borrowers, for instance, internal constraints like limited managerial capabilities and firms being discouraged from applying for conventional loans because of high costs of borrowing and perceptions of complex and burdensome loan application procedures with small prospects of success.

Macroeconomic studies underline that SMEs' financing constraints result in reductions in both productivity and GDP growth at the national level. Because of that, many governments and development actors put SME promotion and SME finance high on their agenda. The World Bank, for instance, commits USD 4.8 billion to SME finance in 47 countries and the G20/OECD High Level Principles on SME Financing suggest a dual approach of increasing credit supply to SMEs and at the same time diversifying financing sources available to them.

Digitalisation holds great promise for supply of, access to, and diversification of financing for SMEs. New players enter the stage, capitalising on the opportunities of digitalisation, above all the reduced transaction costs, the broader access to more and alternative data and the convenient experience for customers. This mitigates many of the challenges in SME finance. Digital instruments increase efficiency and economies of scales, which reduces costs significantly. Increased availability of financial data in combination with alternative mobile phone data can improve screening and credit assessment and thus access for smaller and more opaque firms, and can lower risk and default for financial service providers. Potential borrowers benefit from reduced costs for external finance due to efficiency gains and competition associated with digital finance. Furthermore, digital loan applications significantly reduce the time and resources needed in the application process and increase the simplicity and convenience, which also suits SMEs with limited managerial capabilities and brings SMEs back into the game that have previously been discouraged from applying for conventional bank loans.

The financial system in Sub-Saharan Africa provides fertile ground for digitalisation. The financial market in the region is projected to grow by a compound annual growth rate of 8.5 per cent until 2022. Consumer preferences are favourable for technological innovations in Sub-Saharan Africa, as can be seen in the deployment of mobile money, which is the highest in the world. At the same time, usage of conventional financial services is relatively low in most countries, while the coverage of mobile phones is high (74 per cent in 2018) and still rising.

The promising market conditions, along with the mitigation of longstanding challenges in SME finance and the bypassing of traditional financial institutions, has created a hype over digital innovations in finance. Especially firms that use information technology to provide innovative and improved financial services, commonly known as the FinTech industry, have been expected to completely reshape the financing landscape.

Yet actual market developments and trends generally fall behind such narratives. Main findings of this paper indicate that even though digital advances have led to impressive growth of certain digital finance instruments, it has not triggered a remake of the financial system. Digitalisation of the financial system is less disruptive than many expected, but does gradually change the financing landscapes. Some markets have added innovative and dynamic niches shaped by digital financial services, but new digital players have in general not replaced the incumbents.

Furthermore, the contributions of digital instruments to finance in general and SME finance in particular are still very limited on the African continent compared to either the portfolio of outstanding SME finance by banks or the capital raised by similar innovative instruments elsewhere in the world. Many digital financial instruments such as crowdfunding have been developed in other contexts and have only recently taken hold in Africa such that growth is impressive and shows signs of exponential expansion, but the current levels of raised capital are still very low. The example of crowdfunding reveals the necessity of national legal frameworks such that local digital service providers can emerge and customise digital instruments according to national realities (e.g. offering mobile money and offline solutions). In addition, national crowdfunding platforms are important as they tend to focus more on entrepreneurship and business projects than international ones that raise relatively more funds for social projects.

Mobile money constitutes an exception, as SSA is world leader in its deployment. In Kenya, one of the frontrunners in mobile money, the number of digital credits has surpassed that of conventional loans. Yet their value is still twenty times smaller than the SME portfolio of banks. This highlights that instant loans based on mobile money often have small loan sizes and short repayment periods such that their usefulness for SME finance is rather limited. On top of that, the number of nonperforming loans has been rising recently, which is associated with tech-enabled lending. Regulators have to monitor these developments closely in order to ensure stability and integrity of the market and the wider financial system. Authorities have to avoid trends similar to the financialisation of the poor in the microfinance industry: The convenience and simplicity of digital financial products may lure households, microenterprises and SMEs with poor financial literacy (or simply imprudent actors) into digital financial services with substantial hidden cost structures and risks, which may result in over-indebtedness of already disadvantaged groups, and trigger crises.

Compared to finance that African SMEs acquire via mobile money lending or crowdfunding, raised capital through SME stock exchanges is substantially higher. But even in a good economic environment such as Mauritius, South Africa and Botswana, the stock markets are stagnant and exclusive to a very small fraction of eligible SMEs. While risk financing is an important tool for young and innovative firms with high growth potential, it cannot serve as a remedy for the financing constraints of the broad majority of SMEs.

Many uncertainties remain, most importantly the response of regulators and responsible authorities. They need to provide a suitable legal framework to strike a balance between the innovation and growth aspirations of the digital finance industry and the integrity and stability of markets and the financial system at large. Furthermore, regulators have to safeguard data privacy and cybersecurity as well as prevent illicit financial flows, bad practices around excessive data collection, lacking transparency and poor reporting as well as exploitation of vulnerable groups with limited financial literacy. Governments also face issues around a widening gap with respect to people being left behind by digital finance due to not owning a digital device, lack of mobile network coverage and an internet connection or insufficient basic digital and financial literacy.

This leads to the following policy considerations: National policymakers should proactively guide the development of the digital finance industry through a prudent legal framework such that it advances the inclusive and sustainable economic development of the nation. First of all, this implies that the government needs to invest in the capabilities of its citizens,

most importantly financial and digital literacy, and to ensure that necessary *investments* in physical infrastructure, i.e. mobile networks and Internet connections, are undertaken so that no one is left behind by the digitalising financial system.

Second, authorities should introduce a *legal framework* that strikes a balance between the stability and integrity of new financial markets (as well as the wider financial system) and the room for innovation and growth of the digital finance industry. New digital service providers should obtain differentiated requirements (different from banking regulations) according to their respective intermediation activities. ‘Regulatory sandboxes’, where legislation is tested in a closed setting and regulators can learn about risks without hindering innovation can help in this respect. In any case, regulators need to:

- *protect data privacy*, i.e. prevent excessive data collection without the active knowledge and consent of customers (e.g. prohibit opt-out approaches) and increase the transparency concerning what data is being used and how;
- introduce *binding minimum requirements for cybersecurity* in order to avoid breaches involving very sensitive data;
- *prevent illicit financial flows*, in particular money laundering and financing of terrorism through new digital financial instruments with less transparency;
- introduce *reporting requirements* for non-bank actors to credit reporting agencies and providers in order to raise incentives for on-time repayments and to curb over-indebtedness and fraud, which, in turn, increases efficiency and stability of markets and the wider financial system;
- provide a *legal framework for crowdfunding and other new digital instruments* to foster the emergence of national digital service providers with localised solutions;
- and lastly, *protect vulnerable people from exploitative financialisation* resulting from insufficient financial literacy and hidden cost structures; authorities need to safeguard that customers are sufficiently educated about the nature and functioning of the various financial instruments and about their associated costs and risks.

Only if these requirements are fulfilled, can digitalisation of financial markets contribute to social cohesion of a society. Further research is required to better understand these interconnections and to establish a link between digital financial markets and social cohesion.

## 1 Introduction

The vast majority of enterprises worldwide can be categorised as small and medium-sized enterprises (SMEs). They play a crucial role in providing a livelihood and income for diverse segments of the labour force, in creating new jobs, fostering value added and economic growth. In addition, SMEs are associated with innovation and productivity enhancement as well as economic diversification, inclusiveness and social cohesion (see e.g. OECD, 2017).

However, almost half of the formal enterprises in low and middle-income countries (LMICs) are financially constrained, meaning that their financing needs are unserved or underserved. SME financing in LMICs is USD 2.1-2.6 trillion lower, than the equilibrium level that would materialise in a competitive capital market with costless and complete contracting, no private information and rational expectations, which corresponds to 30-36 per cent of outstanding SME credits in these countries. The severity of the problem varies across regions and is particularly high in Sub-Saharan Africa (SSA) where the financing gap amounts to more than three times the outstanding SME credits (Stein, Ardic, & Hommes, 2013). The reason for the large financing gap is that SMEs suffer disproportionately from institutional and market failures that lead to market imperfections and inefficiencies. Moral hazard and adverse selection lead to distortions in financial markets such that particularly smaller firms become excluded from external finance due to their opaqueness: conventional financial institutions find it hard to lend to smaller firms who cannot provide financial statements, a credit history or credit bureau information, nor adequate collateral in the form of land and buildings. Moreover, transaction costs in credit assessment and subsequent processing and monitoring of loans constitute more or less fixed costs such that smaller loans are more cost-intensive per dollar lent. In short, many financial institutions shy away from SME lending due to the risks and costs involved. This is augmented by issues related to potential borrowers, for instance, internal constraints like limited managerial capabilities and firms being discouraged from applying for conventional loans because of the high costs of borrowing and perceptions of complex and burdensome loan application procedures with little prospect of success.

Various macroeconomic studies point out that financial constraints for the SME sector are associated with reduced productivity growth and slower economic development (see e.g. Beck & Demirguc-Kunt, 2006). For this reason, national governments and development actors generally have SME promotion and SME finance high on their agenda. The G20/OECD High Level Principles on SME Financing, for instance, call for a dual approach of increasing credit supply to SME and at the same time diversifying financing sources available to SMEs. The latter is being realised, amongst others, by new players who enter financial markets making use of some of the potential of modern technology to overcome the challenges in SME finance. They capitalise on the opportunities of digitalisation, above all the reduced transaction costs, the broader access to more and alternative data and the convenience and simplicity that change the customer experience, in order to extend access to financial services to previously unserved or underserved SMEs.

The mitigation of longstanding challenges in SME finance and the bypassing of traditional financial institutions has created a hype around digital innovations in finance in general and specifically around firms that use information technology to provide innovative and improved financial services, commonly known as the FinTech industry. This also led to the

emergence of narratives about a makeover of the financial industry. Forbes, for instance, wrote that “the banking industry is ripe for change with the rise of fintech start-ups, the growing popularity of blockchain technology, and the dominance of millennials” (Sorrentino, 2015), Stanley and Morgan predicted an impressive compound annual growth rate of 47 per cent for the US online lending until 2020 (Mills & McCarthy, 2017) and other sources spoke of an “existential threat to traditional financial intermediation” (see e.g. Thakor, 2019).

Addressing the enthusiasm for digital solutions in SME finance, this paper attempts to answer the question what the role of digital financial instruments in SME finance in Sub-Saharan Africa is. It, first of all, reviews the literature in order to identify the key constraints in SME finance and to assess the state of digitalisation as well as its potential for SME financing in LMICs and in SSA in particular. Second, it looks into some concrete tech-enabled alternative financing instruments in Sub-Saharan Africa, where the financing gap is particularly large compared to current SME financing levels. Systematic and academic research on FinTech and digital financial services is still thin, with crowdfunding and mobile money systems being a positive exception (see e.g. Zalan & Toufaily, 2017). Due to the better availability of data and theoretical and empirical literature, mobile money services (including small instant loans), crowdfunding (including peer-to-peer lending) and public equity finance were chosen for this paper as relevant examples. The equity instrument is admittedly more alternative and to a lesser extent tech-enabled (even though digitalisation also changes and facilitates the operations of incumbents in financial markets such as stock exchanges), but complements the other two instruments as a risk-financing tool to more fully cover the diverse financing needs of different SMEs. For every instrument, this paper aspires to (i) evaluate the opportunities and challenges involved and to (ii) track developments in the respective markets. The main objective is to contrast the narrative around the potential and opportunities of digitalisation with its actual performance in the market – as a sort of reality check, in a manner of speaking.

This paper proceeds by looking at the importance of SMEs for economic development and the constraints they face with regard to accessing external finance (Section 2). Section 3 assesses the opportunities and challenges for SME financing associated with digitalisation and looks at the current state of digitalisation in the financial sector, before Section 4 looks into mobile money, crowdfunding and SME stock exchanges, and their respective opportunities and challenges as well as their market size and recent trends. Section 5 discusses their relevance and potential for SME finance, before the final sections conclude and derive policy considerations.

## **2 The potential of SMEs and their financing constraints**

SMEs account for over 90 per cent of businesses and more than half of the employment in the formal sector worldwide (International Finance Corporation, 2013). These figures already underline the importance of SMEs for economies, even though they do not include the large informal sector that dominates the enterprise landscapes in LMICs. This section lays out the vital role of SMEs for inclusive economic development through their contributions to employment, job creation, value added, inclusive growth, economic diversification, innovation and productivity growth. In the second part of this section,



constraints in SME finance are laid out, covering both supply-side challenges such as high transaction costs, asymmetric information, securitisation, weak creditor protection and limited competition as well as issues related to potential borrowers such as high costs of borrowing, constraints within a firm, inadequate bankruptcy laws and crowding out.

## 2.1 The importance of SMEs for inclusive economic development

Almost all of the enterprises worldwide are of micro, small or medium size and a substantial share of these MSMEs are subsistence-based enterprises, i.e. stagnant one- or few-person enterprises that constitute unemployment in disguise rather than typical growth-oriented enterprises (i.e. opportunity-based enterprises; see Box 1 for more on defining and differentiating SMEs). Still, SMEs do not only play a crucial role in providing a livelihood and income for diverse segments of the labour force, but also in creating new jobs and thus in fostering value added and economic growth. In addition, SMEs promote innovation and productivity as well as economic diversification and inclusiveness.

*Employment and job creation.* The vast majority of enterprises are small or medium-sized and these firms are responsible for the majority of formal employment and the creation of a significant share of new jobs in LMICs. SMEs account for over 90 per cent of firms and more than half of the employment in the formal sector worldwide (International Finance Corporation, 2013). In LMICs, the role of SMEs is even more profound as they employ more than 60 per cent of the formal workforce (Harwood & Konidaris, 2015). These figures already underline the importance of SMEs for economies even though they do not include the large informal sector that dominates the enterprise landscapes in LMICs. In spite of the broad consensus on the SMEs' prominence in providing employment (Ayyagari, Beck, & Demirguc-Kunt, 2007; Ayyagari, Demirguc-Kunt, & Maksimovic, 2011, 2014; De la Torre, Soledad Martinez Peria, & Schmukler, 2008; Hallberg, 2001; Harwood & Konidaris, 2015; International Finance Corporation, 2013), it is disputed whether SMEs contribute more to employment creation than large firms. Survey evidence indicates that SMEs generate most new jobs in LMICs, even when controlling for firm age and other characteristics (Ayyagari et al., 2007; Ayyagari, Demirguc-Kunt, et al., 2011; Ayyagari et al., 2014).<sup>1</sup> Critics emphasise that survey data cannot control for survivor bias and the composition effect so that the net effect is not measured adequately (Page & Söderbom, 2015; Rijkers, Arouri, Freund, & Nucifora, 2014). The net effect is crucial because of the churning of smaller firms: small young firms are characterised by significantly lower survival rates (Klapper & Richmond, 2011). Following this line of critique, Page and Söderbom (2015) use panel data for Ethiopia to show that the contribution of SMEs and large firms to employment creation is comparable when controlling for these sources of bias.<sup>2</sup>

*(Inclusive) economic growth and social cohesion, value added and diversification.* Despite some mixed evidence, findings indicate that SMEs are associated with economic growth, a substantial share of value added and economic diversification. While some scholars only find evidence for a positive relationship between entrepreneurship and growth in high-

---

1 Haltiwanger, Jarmin, and Miranda (2013) find similar results for the US, but find the relationship to diminish when controlling for firm age.

2 Using data from Tunisia, Rijkers et al. (2014) constitute that, post-entry, large firms contribute more to job creation such that firm size is positively correlated with job creation.

income countries (HICs) (Van Stel, Storey, & Thurik, 2007; Wennekers, Van Wennekers, Thurik, & Reynolds, 2005), other researchers focus more on SMEs and consequently also find a strong and positive association with gross domestic product (GDP) per capita in LMICs (Beck, Demirguc-Kunt, & Levine, 2005). However, this cross-country regression cannot silence doubts about the causality of the relationship. In any case, SMEs have the potential to raise inclusiveness of growth as they create economic opportunities such as employment, skills development and upward mobility in diverse geographic areas and economic sectors; in particular SMEs go to places that do not have the scale to draw larger firms and SMEs create opportunities for disadvantaged and marginalised groups such as young people, women and minorities (OECD, 2017). Wider job availability and inclusive economic development, in turn, contribute to social cohesion (see e.g. Sommer, 2019; World Bank, 2012).

**Box 1: Defining and differentiating SMEs**

There is no universally agreed-upon definition of small and medium-sized enterprises. Classifications vary across countries, donors and international organisations, and sometimes even across industries or ministries within the same country. Most commonly used are thresholds for number of employees, but also thresholds for assets and sales/turnover or combinations thereof (Gibson & Van der Vaart, 2008). Kushnir, Mirmulstein, and Ramalho (2010) note, on the one hand, that more than one third of the 132 countries included in their “MSME Country Indicators” define MSMEs as having fewer than 250 employees. On the other hand, they highlight that any categorisation of firms in micro, small, medium and large needs to consider national economic contexts. This makes a universal definition undesirable. Following their line of argumentation, this paper uses a loose definition of SMEs by simply adopting the respective national definitions or definitions provided in the cited studies. These mainly rely on a headcount of employees due to its appealing simplicity.

This paper purposefully excludes informal and micro enterprises (based again on the respective MSME/SME definitions) when speaking about SMEs since, first of all, their contribution to growth and development is negligible even though they account for a substantial share of economic activity in LMICs (e.g. Porta & Shleifer, 2008); and second, since they behave quite differently compared to SMEs as described in the following paragraph.

Differentiation of small, medium and large enterprises goes well beyond their size, as these firms vary widely with regard to organisational structures, behaviour, strategy and other dimensions. Furthermore, a distinction between formal and informal enterprises is useful, whereas the latter are often equalised with micro enterprises and left out of studies due to issues with data availability (Beck, 2013). The majority of informal and micro enterprises is likely to behave differently than the average SME as they are more accurately described as being entrepreneurs by necessity who choose self-employment mainly because of a lack of alternatives in the formal labour market. Suggestive evidence thereof is given by countercyclical net firm creation rates of micro and small enterprises in panel data from Zimbabwe and the Dominican Republic: micro enterprises shut down in macroeconomic growth periods when formal employment is more broadly available and re-emerge during economic downturns when formal sector jobs disappear and unemployment looms. ‘Necessity-based’ entrepreneurs try to meet their livelihood needs through the enterprise and, in contrast to ‘opportunity-based’ entrepreneurs, generally shy away from capital-intensive investments, innovation and other growth-oriented activities as these involve significant risks (De Kok, Deijl, & Veldhuis-Van Essen, 2013). This view is underlined by the fact that only 30 per cent of microenterprise owners in Sri Lanka share characteristics with owners or managers of large enterprises (i.e. opportunity-based entrepreneurs) while 70 per cent in Sri Lanka (De Mel, McKenzie, & Woodruff, 2008) or 50 per cent in Mexico rather resemble wage earners (Bruhn, 2013).

Depending on the definition of SMEs and the country focus, their contribution to GDP ranges from a modest 16-20 per cent in low-income countries (LICs) (Esho & Verhoef, 2018) to substantial contributions (Ayyagari, Demirgüç-Kunt, & Maksimovic, 2011) even surpassing the 50 per cent mark in most countries when also including informal firms (IFC,

2010). More importantly, a vibrant SME sector drives diversification and resilience (OECD, 2017). This is particularly important for the economies of LMICs that are dependent on single sectors or industries and exposed to commodity price fluctuations.

*Innovation and Productivity.* Smaller enterprises are on average less productive, but some small and young firms implement influential innovations that are pivotal for productivity leaps and economic growth. Employees at SMEs are on average significantly less productive than at large firms (e.g. ILO, 2015; Page & Söderbom, 2015). Larger firms benefit from economies of scale and are better positioned to engage in productivity-enhancing activities such as investments in machinery and personnel, product development and outsourcing (ILO, 2015). SMEs, on the contrary, are very heterogeneous: a substantial fraction is headed by subsistence entrepreneurs that started the business to meet the monthly minimum requirements of their families and thus do not envisage risky, capital-intensive expansions or innovations (Kumar, 2017). Still, almost every large and productive firm had started as a small enterprise. And SMEs are identified as an important source for pivotal innovations as they move quick and “work outside of dominant paradigms” (OECD, 2017): some small and young innovative firms introduce new efficient technologies or – especially important for LMICs – make small modifications in order to adapt innovations to the local or national contexts or benefit from knowledge spillover in global value chains (GVCs) and other partnerships and cooperation, which boost productivity.

## 2.2 SME finance and its constraints

As a result of internal constraints, SMEs suffer disproportionately from institutional and market failures, most importantly from constrained access to finance (Beck, 2013; OECD, 2017). SMEs may face several impediments to business development such as poor institutional and physical infrastructure, political instability, corruption and/or burdensome legislation. According to the Enterprise Surveys of the World Bank, enterprise managers, however, rank access to finance as the most binding constraint to the growth of their businesses (World Bank, 2017). This subsection briefly looks at the costs and causes of the financing constraints, and outlines the difficult financing situation of SMEs in LMICs and SSA.

Bearing in mind the importance of SMEs for the national economies, as laid out in Section 2.1, constraints in SME finance come at the cost of unrealised growth and productivity improvements at both the firm and the national level. Survey evidence from various studies shows that owners and managers of SMEs identify access to finance as the most severe obstacle to firm performance and growth (e.g. Beck & Cull, 2014; Beck & Demirguc-Kunt, 2006; Dong & Men, 2014), which is reinforced by academic reviews on finance and SMEs (Esho & Verhoef, 2018; Kersten, Harms, Liket, & Maas, 2017; White, Steel, & Larquemin, 2017); firms save larger shares of their profits to build up internal funds and cover expenses associated with financial constraints instead of realising productivity-enhancing investments in fixed assets and labour (Beck, Homanen, & Uras, 2019). A multitude of studies reveals that this results in constrained productivity growth and economic development at the macroeconomic level (e.g. Bartelsman, Haltiwanger, & Scarpetta, 2013; Beck & Demirguc-Kunt, 2006; Beck, Demirguc-Kunt, & Maksimovic, 2005; Beck, Demirguc-Kunt, & Maksimovic, 2008; Bloom, Mahajan, McKenzie, & Roberts, 2010; Hsieh & Klenow, 2009).

The following discusses causes of the challenges in SME finance. In doing so, supply-side challenges are outlined first, before moving to issues related to potential borrowers. The literature about the supply side is broader and more prominent. It emphasises problems associated with high transaction costs, opaqueness of SMEs, collateral requirements, weak legal frameworks and institutions, and limited competition. According to survey evidence, banks perceive the SME segment as profitable both in LMICs in general (Beck, Demirguc-Kunt, & Martínez Pería, 2011; De la Torre et al., 2008; Ramalho et al., 2018) and in Africa in particular (EIB [European Investment Bank], 2018). This being said, banks and other suppliers of finance face several obstacles when trying to serve SMEs:

First, transaction costs that arise during credit assessment, processing and monitoring of the loan and during asset liquidation after default, are more or less fixed, rendering smaller loans more cost intensive per dollar lent. This is passed on to SMEs via higher fees and/or interest rates (Arráiz, Meléndez, & Stucchi, 2014; Beck, 2013; Beck & Demirguc-Kunt, 2006; Esho & Verhoef, 2018; Ramalho et al., 2018).

Second, the opaqueness of many SMEs (ex-ante information asymmetry) prevents banks from lending to loanable SMEs. Many SMEs can neither provide a credit history or entries at credit bureaus nor (audited) financial statements leading to problems of asymmetric information and adverse selection (Beck, Demirguc-Kunt, Laeven, & Levine, 2008; Esho & Verhoef, 2018; Kersten et al., 2017; Love & Mylenko, 2003; Miller, 2003; OECD, 2017). This contributes to banks experiencing higher default rates in SME lending and charging a risk premium, i.e. higher interest rates for SMEs (e.g. Beck & Demirguc-Kunt, 2006; Ramalho et al., 2018).

Third, banks usually require collateral as a security for their loans. Fixed assets are the most common form of collateral, but smaller SMEs generally do not own land and buildings or cannot use it as collateral because of a lack of ownership certificates (e.g. Beck, 2013; EIB, 2018; Kumar, 2017; Ramalho et al., 2018). Moveable assets are often not eligible for collateralisation when dealing with banks, even though moveable asset registries are slowly changing the landscape in some LMICs.

Fourth, banks may be discouraged from serving SMEs because of weak legal frameworks or institutions that do not sufficiently guarantee creditor protection in insolvency (e.g. Galindo & Micco, 2004; Ramalho et al., 2018) or because of burdensome legislation that drives up the cost of catering to SMEs in compliance with regulations (e.g. OECD, 2017).

Lastly, limited competition in the financial system compromises the supply of finance for SMEs: It reduces the willingness of risk-taking such that financial institutions shift their loan portfolio away from SME lending (Beck, Demirgüç-Kunt, & Levine, 2010; De Haas & Naaborg, 2005; Love & Martínez Pería, 2014). It also diminishes or completely dries up secondary SME bond markets limiting the exit options of venture capitalists and angel investors (and thus the attractiveness of acquiring SME-related securities in the first place) (OECD, 2017); and it facilitates withdrawals of funds by HIC-based banks when conditions in financial markets of LMICs deteriorate, such as recently experienced in Sub-Saharan Africa (EIB, 2018).

Issues associated with potential borrowers comprise high costs, SMEs' internal constraints, legislation and crowding out by the state. First, the higher costs of SME lending (higher transaction costs and default rates) have to be carried by borrowing SMEs in the form of

higher fees and interest rates. SMEs are further discouraged by the time and resources spent for the complex credit application procedures and the extensive information requirements by conventional financial institutions. Second, limited managerial capabilities may hinder SMEs, for instance, through lacking awareness and financial knowledge about financing options or through poor strategic vision of the managers and owners (EIB, 2018; Kumar, 2017; OECD, 2017; White et al., 2017). Sometimes, SMEs do not even try to apply for external finance due to their pessimistic attitude about the chances of success (Colla & Kühn, 2017). Third, SMEs may abstain from external finance due to fear of over-indebtedness and personal liability for the firm's debts due to inexistent or inadequate bankruptcy laws (Kumar, 2017). Lastly, SMEs are in some cases crowded out by the national government overly using the national equity and debt markets to finance its activities. Throughout Sub-Saharan Africa, sovereign debt holdings by national banks have risen between 2014 and 2018. Ghana, Niger, Tanzania and Zambia already exhibit elevated levels of sovereign debt and several other countries may follow soon (EIB, 2018).

Several studies show that within and across different regions as well as across countries worldwide, smaller and younger firms are more likely to be excluded from external finance (e.g. Beck & Cull, 2014; Beck & Demirguc-Kunt, 2006; Beck, Demirgüç-Kunt, et al., 2008; Dong & Men, 2014; Quartey, Turkson, Abor, & Iddrisu, 2017; Stein et al., 2013). Most SMEs depend on internal or informal finance, namely personal funds, funds from family and friends or retained profits, and this is applicable both in HICs (OECD, 2017) and in LMICs (Beck & Cull, 2014). Estimates for the percentage of formal SMEs that are partially or fully underserved with external finance worldwide range from 44 per cent (Bruhn et al., 2017) to 85 per cent (Stein, Goland, & Schiff, 2010); a country-level overview is provided in Figure 1.

**Figure 1: Financially constrained MSMEs (unserved or underserved)**



Source: SME Finance Forum (2019), all rights reserved, used with permission

If SMEs get access to external finance, they heavily rely on bank financing via loans, overdrafts and secured credits (Esho & Verhoef, 2018; OECD, 2017), and to a minor extent

on trade credit, factoring, leasing or equity finance such as venture capital and business angels. The most recent analysis estimates that close to half of the SMEs in LMICs lack access to finance (either fully or partially). The above-mentioned market failures lead to a financing gap, i.e. SME financing levels that are USD 5.2 trillion lower than the efficient capital market equilibrium under full competition, full information, costless and complete contracts as well as rational expectations. This amounts to 1.4 times the current levels of SME lending in LMICs (Bruhn et al., 2017). The high figures for the financing gap are partly explained by the methodological approach using ‘potential demand’ instead of the latent actual demand for credit by SMEs (see Box 2 on the financing gap). A more conservative analysis points at a financing gap of USD 2.1-2.6 trillion for MSMEs in LMICs corresponding to 30-36 per cent of current SME credits. In any case, there is consensus on enormous regional differences with particularly severe financing shortages in African countries (e.g. Beck & Cull, 2014; Beck et al., 2011) so that the financing gap is more than three times the outstanding SME credits in Sub-Saharan Africa (Stein et al., 2013).

**Box 2: The financing gap**

According to standard economic theory, market-clearing equilibrium interest rates ensure that demand equals credit supply so that ‘financing gaps’ cannot exist. Yet the seminal work of Stiglitz and Weiss (1981) about credit rationing pointed out that moral hazard and adverse selection can lead to distortions in financial markets such that loanable projects/firms remain unserved. In such a world, financing gaps can emerge as a result of market failures.

Cressy (2002) introduces two definitions for the financing gap – or funding gap as he refers to it: A positive one that describes the financing gap as “an equilibrium, in which volume of lending is below that which would emerge in a competitive capital market with costless and complete contracting, no private information and rational expectations”; and a normative one claiming that it is “a market failure, the appropriate policy response to which is an increase in the volume of lending” (Cressy, 2002, p. 2).

The International Finance Corporation (IFC) has been the driving force in exploring the severity of the financing gap for MSMEs in LMICs. A first study was published in 2010 in cooperation with McKinsey and Company concluding that formal and informal MSMEs in LMICs would need an additional USD 2.1-2.5 trillion (one third of outstanding SME credits) to meet their financing needs (Stein et al., 2010). A reassessment by the IFC in 2013 expanded the analysis to 177 countries and put the financing gap at USD 2.1-2.6 trillion (30-36 per cent of outstanding SME credits). The latest IFC study from 2017 employs a modified methodology based on three steps: i) estimating the credit demand by MSMEs under close to ideal market conditions, i.e. with minimal imperfections, using the 10 HICs with the highest “access to credit score” of the World Bank’s Doing Business database as a benchmark; ii) deriving the “potential demand” in LMICs, which is supposed to capture the credit demand by MSMEs (and the amount that financial institutions could supply) if “they operated in an improved institutional, regulatory and macroeconomic environment” (Bruhn et al., 2017, p. 8); iii) comparing this figure with the actual financing supply to measure the financing gap. Due to data availability, the sample was restricted to 128 countries (112 LMICs) and the financing gap estimated at USD 5.2 trillion for formal MSMEs (140 per cent of outstanding SME credits) with an additional USD 2.9 trillion of potential demand by informal firms (Bruhn et al., 2017). These latest figures are, at best, upperbound estimates of the financing gap and, more likely, vastly overestimate the actual need for additional SME finance. The reason is that the estimates do not rely on the latent actual demand for credit by SMEs (which would measure the current additional financing needs of SMEs), but on potential demand, which will only materialise if institutional, regulatory and macroeconomic environments in LMICs improve. In such a fictional, more conducive investment climate (which may only be realised in the medium- to long-term future), demand for finance is obviously significantly higher than the demand under the current less favorable conditions, which leads to inflated estimates for the (current) financing gap.

### **3 The role of digitalisation in mitigating financing constraints of SMEs**

In response to, first, the importance of SMEs for inclusive economic development and second, the challenges in SME finance and the resulting financing gap, national governments, international institutions and organisations as well as other actors in the field of development cooperation have set SME promotion and SME finance high on their agenda: The World Bank, for instance, is engaged in SME finance in 47 countries with a portfolio of over USD 4.8 billion (Ramalho et al., 2018). The G20/OECD High Level Principles on SME Financing suggest a dual approach of increasing credit supply to SME and at the same time diversifying financing sources available to SMEs. The latter can be seen, amongst other things, as a call for digital financing solutions.

Digitalisation transforms various industries and sectors and also holds great promises for access to as well as supply and diversification of financing for SMEs. The financial system is already undergoing far-reaching changes. New players enter the stage capitalising on the opportunities of digitalisation, above all the reduced transaction costs, the broader access to more and alternative data and the convenient experience for customers. The following section briefly takes stock of opportunities and challenges, and where we stand with regard to digitalisation in the financial systems.

#### **3.1 Opportunities of digitalisation in SME finance**

With the exception of problems associated with the legal framework, digitalisation has the potential to address, to a varying degree, all of the challenges in SME finance that were identified in the previous section. Digitalisation provides ample opportunities to decrease transactional costs to a minimum (Arner, Barberis, & Buckley, 2015; Chuen, Lee, & Teo, 2015; Mills & McCarthy, 2017; Thakor, 2019). Mills and McCarthy (2017) emphasise that this applies to every stage of the lending process from credit assessment via the processing to the monitoring of the loan. Furthermore, the (partial) automation of data collection for credit assessment and monitoring as well as the automation of internal processes increase efficiency and thus allow banks to serve more SMEs (Mills & McCarthy, 2017; Thakor, 2019). Even more important for reaching financially excluded SMEs are the opportunities created by digital advances in mitigating issues of firm opacity and asymmetric information. Better tools for screening and assessment of creditworthiness do not only improve access to finance but also empower financial institutions to lower risk and default (which, in turn, allows to lower risk premiums and attract more customers with more affordable loans) (Demertzis, Merler, & Wolff, 2018; Thakor, 2019). Mobile money, for instance, allows to build up a transaction history, which gives access to small short-time loans from the same digital finance provider and thus establishes a credit history. Often, such conventional data is combined with (or even completely replaced by) alternative data from mobile phones, social media, online marketplaces and other sources. The reduced information asymmetry in combination with new algorithms that also exploit alternative data, renders digital finance providers better equipped to serve smaller, opaque firms (International Finance Corporation, 2017). This is particularly good news for disadvantaged groups that are disproportionately affected by exclusion from external finance, such as women and young entrepreneurs. Better screening and credit assessment also mitigate loan securitisation or make it completely redundant, as digital finance providers generally do not require collateral (International Finance Corporation, 2017). Even the last remaining

shortcoming on the supply side, limited competition, is moderated by new digital finance providers who enter the market and challenge established financial institutions, especially in household, microenterprise and SME finance.

Digital advances in the financial sector also alleviate the challenges for potential borrowers by reducing costs, improving the customer experience and scaling up accessibility and inclusiveness. Digital finance providers can pass on cost savings from better and more efficient lending and screening procedures to customers (see above). More importantly, digital loan applications significantly reduce the time and resources needed in the application process: online applications only take a few minutes and can be done via laptop or phone at any time in contrast to burdensome, hour-long and paper-based procedures at conventional banks; approval times shrink from weeks to days or a few minutes (Mills & McCarthy, 2017). The greatly improved convenience for borrowers does not only address cost issues, but also internal constraints of SMEs. Digital applications are more functional and set a new level of simplicity and convenience (Arner et al., 2015; Demertzis et al., 2018; Mills & McCarthy, 2017; Thakor, 2019), which also suits SMEs with limited managerial capabilities. Furthermore, the new customer experience with digital finance also brings back SMEs that have been discouraged to apply for conventional bank loans (International Finance Corporation, 2017). Lastly, new digital financing alternatives offer some alleviation from crowding out simply by increasing the supply of SME finance.<sup>3</sup> Moreover, it is difficult to imagine how new digital finance providers with their small-scale and very targeted financing instruments could shift their portfolio away from SMEs to sovereign lending.

The greatest opportunity is the potential of catching up or even leapfrogging that could be spurred by digitalisation, especially since Africa is a region with a particularly large financing gap in SME finance. The financial markets in many African countries seem to offer fertile ground for digital innovations. First of all, because consumer preferences and adaptability are favourable to digital financial products. Customers in Sub-Saharan Africa adopt digital technologies more readily than customers in high-income countries: mobile money services, for example, are most heavily used in SSA (EIB, 2018) with mobile money accounts here accounting for almost half of the accounts worldwide (GSMA, 2019). The fertile ground is laid by a mobile phone penetration rate of 74 per cent among the adult population in 2018 that is expected to rise to 85 per cent by 2025, with two thirds of these mobile phones being smartphones (GSMA, 2019). African banks try to respond to these changes in the customer base and an increasing proportion of banks plans the deployment and scaling up of internet-banking technology, mobile banking and FinTech according to a recent bank survey by EIB (2018). Second, the large number of unserved and underserved firms and households in Africa holds great growth potential for the banking market (Chironga, Cunha, De Grandis, & Kuyoro, 2018), which allows easy recuperation of investments in digital innovations. With a return on equity of 14.9 per cent, the banking sector in Africa already is highly profitable (second only to Latin America) and banking revenues are projected to rise by a compound annual growth rate (CAGR) of 8.5 per cent (second-fastest growth after Latin America) until 2022 so that revenues will be 50 per cent higher than the 2017 level. The number of people banked will increase over the same

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3 Digitalisation has also improved cross-border money transfers. Channeling flows of remittances at significantly lower costs to LMICs does not increase supply of external finance, but may also benefit entrepreneurs in need of finance, as it enhances the availability of informal or internal finance from personal funds or funds of family and friends.



timespan from 300 to 450 million, lifting the rate of people reached by banking from 35 to almost 50 per cent of the adult population (Chironga et al., 2018). Such a quickly evolving market will spark competition, which necessitates cost-efficient and customer-friendly digital services in order to stay in the market. The Alliance for Financial Inclusion (2018) echoes that digitalisation of financial services is a necessity to prevail in such a setting.

As laid out in this subsection, digitalisation has the potential to greatly enhance affordable access to finance and thus unlock SMEs' contribution to inclusive economic development (see Section 2.1). First empirical evidence from a cross-country study on 49 countries in Sub-Saharan Africa does indeed indicate that mobile financial and banking services are positively associated with inclusive and pro-poor growth as captured by GDP per capita, the GINI coefficient and the poverty index (Nguena, 2019). Since claims about instrumentation are not well-documented, doubts about the identification strategy remain and the analysis has to be seen as mere correlation evidence that does not support any causal claims.

### 3.2 Challenges of digitalisation in SME finance

The primary concern in a digitalising financial system is regulation. As in many other industries before, such as the banking industry (Keeley, 1990) or the payment industry (Berger, Hancock, & Marquardt, 1996), regulators have to strike a balance between ensuring integrity and stability of the market and giving enough space to the industry for continued competition, innovation and rapid expansion. This encompasses topics of protecting privacy, ensuring cybersecurity, combatting illicit financial flows, money laundering and financing of terrorism as well as eliminating bad practices and exploitative financialisation. One difference to previous safety-efficiency trade-offs is the lower certainty about benefits (mainly economic efficiencies) and associated risks in the relatively young and rapidly developing digital finance industry (Maino, Massara, Perez-Saiz, Sharma, & Sy, 2019). In addition to regulatory challenges, governments also face a widening gap to those left behind in digital finance.

The legal framework needs to ensure data privacy such that sensible information may be used by authorised financial service providers only for the task at hand rather than being shared for other purposes within or even outside the specific service provider. The issue becomes particularly delicate if the financial service provider additionally uses alternative data from social media, online platforms and other sources (see e.g. International Finance Corporation, 2017; Maino et al., 2019).

Closely related to the data privacy issue is the protection of private and public data against cybercrime. It cannot be understated how much damage data leaks in the financial industry can cause for service providers, customers as well as in terms of the trust in and the functioning of the financial system. A growing digital finance industry will attract more attention and criminal activities from hackers, which makes cybersecurity a serious concern. However, especially smaller financial institutions and FinTechs will have a hard time installing and updating cost-intensive cybersecurity systems, which may result in underinvestment and critical security vulnerabilities (International Finance Corporation, 2017; Maino et al., 2019).

New financial services always introduce novel opportunities for money laundering, terrorism and other illicit financial flows. Digital finance facilitates cross-border payments in terms of speed, costs and efficiency and may thus benefit internationally operating criminal networks. Regulators have to closely look into new digital instruments that foster anonymity and decrease transparency in the financial system, as such developments aggravate problems of money laundering, financing of terrorism and other illegal activities (Maino et al., 2019).

Regulators also need to safeguard that malicious practices do not undermine the integrity of the digital finance industry. This refers to a variety of different actions, the list of which will continue to get longer and longer so that the scope of the issues discussed here cannot be comprehensive. One important element is the legal obligation for financial service providers to provide some minimum level of transparency: revealing, for instance, which (type of) data is being collected and used in recruiting and assessing customers. This could also include a binding legislation for ‘opt-in’ approaches that rule out automated data collection without the customers’ active knowledge and consent: Opt-out features are often hidden and obscure such that customers effectively cannot prevent excessive collection of private data. Another concern calling for binding rules might be the reporting to credit reporting agencies and service providers. Especially non-bank providers of finance are often not obliged to report loan applications and performance of their customers. Yet a well-functioning and comprehensive reporting system facilitates information sharing across the financial industry and strengthens efficiency as well as integrity and stability of the system as it raises incentives for on-time repayments and counteracts over-indebtedness and fraud (International Finance Corporation, 2017).

Maino et al. (2019) argue that the increasing activities of FinTech companies could seriously destabilise the financial systems. They suggest that substantial parts of the digital finance industry can be regarded as ‘shadow banking’, i.e. offer financial services similar to banks without falling under banking regulations. Maino et al. (2019) warn that “the lack of appropriate regulation in the shadow banking sector, and their vulnerable business model, led to rapid contagion to the rest of the financial system [during the financial crisis of 2007/08]”. According to them, vulnerabilities for the wider financial system result from, first, increased competition that undermines the solvency of established financial institutions as profitability falls and risk taking increases; secondly regulatory arbitrage and risk shifting due to different regulatory requirements for banks and FinTechs on capital and liquidity and thirdly, because of new players with little experience in the financial industry entering the market.

Furthermore, digital finance regulators need to protect customers with little to no financial literacy from exploitative financialisation. The low entry threshold of digital financial products due to their convenience and simplicity for customers provides fertile ground to lure households, microenterprises and SMEs with poor financial literacy (or simply imprudent actors) into the take-up of digital financial services, in particular insurance and credit products, that may come with substantial hidden cost structures. The Alliance for Financial Inclusion (2018) further points out that not all digital services fall under the consumer protection policies applicable to banks and financial institutions. As observed in the microfinance industry, these are the ingredients for over-indebtedness of already disadvantaged groups. According to EIB (2018), non-performing loans are on the rise, which has been associated with digital lending. Regulators need to learn from the problems

and crises in microfinance to prevent further financialisation of the financially excluded and underserved (Mader, 2015). Yet it is hard to verify and control that digital financial service providers meet their due diligence obligations in educating and empowering their customers to fully comprehend the financial products.

Lastly, digitalisation constitutes to some extent a double-edged sword: while it fosters financial inclusion on an unprecedented scale, it may simultaneously increase the gap to a small group of disadvantaged. The 2030 Agenda of the United Nations General Assembly (2015) makes the demand to “leave no one behind”. Digital financial services greatly contribute to financial inclusion by bringing a diverse set of services to previously unserved and underserved SMEs and households. They may even reach parts of rural areas and offline dwellers. However, they require certain preconditions that need to be met: ownership of a digital device, mobile network coverage or an internet connection, as well as basic digital and financial literacy. Even though these preconditions constitute no concern for the vast majority, a small group of disadvantaged will be left behind because of bottlenecks associated with these factors. And the gap to those left behind may become large and hard to bridge.

### 3.3 The state of digitalisation in SME finance

While digitalisation has opened the door for new players to enter the financial markets, debt finance through banks still dominates (formal) external finance of SMEs. Mills and McCarthy (2017) argue that banks have by and large modified neither their SME lending nor other banking operations with the advent of digital innovations. They claim that most banks have failed to digitalise services beyond the core of online transactions and remote deposits. To further reinforce their point, Mills and McCarthy (2017) cite an analysis by Bain and SAP that merely for 7 per cent of bank credits is it possible to digitally manage them from end to end. Banks in SSA are no exception to that trend as can be seen, for instance, by their passive role in the mobile payment industry where mobile service providers have taken the lead (EIB, 2018).

Against this background, it is not too surprising that costs for financial services remain high. Philippon (2016) claims that inefficiencies in financial systems persist since the unit cost of financial intermediation has oscillated around 2 per cent in the US for the last 130 years. Cost-reducing digital advances should have brought down the price of financial services for customers. This points at the benefits of digitalisation either not being taken advantage of, or not being passed on to the end users. Thakor (2019) argues that FinTechs could alter the picture such that efficiency gains of the industry are shared with the customers. His optimism is nurtured by evidence of productivity improvements in mortgage lending (Fuster, Plosser, Schnabl, & Vickery, 2019).

SMEs desire progress in the provision digital financial services and FinTechs try to fill the vacuum. One survey finds that 56 per cent ask for better digital banking tools while another survey states that more than 60 per cent of SMEs would prefer online loan applications (Mills & McCarthy, 2017). FinTechs try to take advantage of the unmet demand and untapped market segments (see Box 3 on FinTechs). They have taken on a prominent role in digital payments and also aim for the credit and insurance markets. At least in the African context, FinTechs need to graduate from mere payment to intermediation (EIB, 2018). It is

hard to quantify the contributions and shares of FinTechs to the different markets, as even in advanced markets such as Europe, data on FinTechs cannot match the comprehensiveness and homogeneity of conventional banking data (Demertzis et al., 2018).

**Box 3: FinTechs: definition, hype and actual developments**

FinTech is short for the term ‘financial technology’ and describes the employment of information technology to provide innovative and improved financial services. The following definition from the Financial Stability Board is gaining popularity and has been adopted by the Basel Committee on Banking Supervision, as it is concise yet broad and comprehensive enough to accommodate the fluid and evolving FinTech industry: FinTech is defined as “technologically enabled financial innovation that could result in new business models, applications, processes, or products with an associated material effect on financial markets and institutions, and the provision of financial services” (Thakor, 2019).

The blockchain technology is one of the key elements, if not *the* central building block for FinTech (for more on blockchain, see for instance Ohnesorge (2018)) and has found wide applications. Demertzis et al. (2018) organise the FinTech activities into the four main segments of (i) alternative financial intermediation (peer-to-peer (P2P) lending, crowdfunding etc.), (ii) payment systems and transfers, (iii) personal finance and (iv) insurance.

Systematic and academic research around FinTech is still at a very early stage and extremely thin, and most work on FinTech stems from banks and consultants (Zalan & Toufaily, 2017). Issues of data availability and reliability hamper rigorous research. The young strand of academic literature builds around publications from law schools, that address the regulatory challenges as well as publications from management and business schools that use substitution and disruption theory to explain changes in the financial system. Interestingly, many scholars argue that FinTech in general and blockchain technology in particular cannot be considered as disruptive (e.g. Iansiti & Lakhani, 2017; Zalan & Toufaily, 2017). Rather, it is described as building new foundations for the economy and society at large, but doing so over the course of decades through gradual adoption and not through a sudden and disruptive landslide (Iansiti & Lakhani, 2017).

This is in stark contrast to the hype around FinTech mostly outside the academic world that has been nourished by the introduction of innovative financial services that bypass traditional players and also tap new market segments (Thakor, 2019). The narrative about a makeover of the financial industry emerged; Forbes wrote that “the banking industry is ripe for change with the rise of fintech start-ups, the growing popularity of blockchain technology, and the dominance of millennials” (Sorrentino, 2015), Stanley and Morgan predicted a CAGR of 47 per cent for US online lending until 2020 (Mills & McCarthy, 2017) and other sources spoke about an “existential threat to traditional financial intermediation” (see Thakor, 2019).

Accenture provides data about worldwide investments into FinTech. Even though this data cannot be comprehensive and completely reliable, it allows tracing the growth and approximating the size of the industry. In 2010, the FinTech industry started from a very low base of less than USD 2 billion, growing exponentially to over USD 55 billion in 2018 (Barreto, de Freitas, & Volin, 2019b), before taking a blow to worldwide investments in the first half of 2019 with a 29-per cent decrease due to plummeting investment levels in China (Barreto, de Freitas, & Volin, 2019a). Investment differs significantly by region: While North America completely dominated the FinTech industry till 2014, the Asia-Pacific region started to play an equally or even more dominant role in 2016. FinTech investments in Europe became more influential in 2017, but the rest of the World (including Africa) remains extremely marginalised (Barreto et al., 2019b). These developments are mirrored by FinTech lending in the credit market. Impressive growth from a low base of USD 11 billion in 2013 to USD 284 billion in 2016 was followed by sharp decline in the Chinese market due to regulatory changes. However, the share of FinTech credits in the overall net loan originations shows that actual developments sharply fall behind the narrative and hype around FinTechs: It is very marginal in most countries and even frontrunners such as China and the US in 2016 exhibited modest FinTech credit shares of 13 per cent for the former (before the decline in China) and 4 per cent for the latter (Claessens, Frost, Turner, & Zhu, 2018).

Their role varies significantly across regions and countries with the vast majority of USD 243 billion stemming from FinTech credits in the Asia-Pacific region (mainly China) followed by USD 33 billion in the Americas (mainly US), USD 8 billion in Europe and a

meagre USD 134 million in the Middle East and Africa in 2016. Despite considerable growth<sup>4</sup> of FinTech credit activity from USD 11 billion in 2013 to USD 284 billion in 2016, the share of FinTech credits among all net loan originations remains very marginal in most countries: for China it amounted to respectable 13 per cent and to 4 per cent in the US (Claessens et al., 2018). The situation looks similar for SME credits, as indicated in the next sections (see especially the sub-sections Market size and trends and the Discussion section).

#### **4 Alternative financing instruments for SMEs: hype versus reality**

Especially the growing FinTech industry (see Box 3), already makes use of some of the potential from modern technology to overcome the challenges in SME finance (see Section 3.1). In the spirit of the dual call of the G20/OECD High Level Principles for augmenting the credit supply for SMEs and diversifying SME financing sources, new financing instruments are emerging. They increase speed, convenience and success of applying for finance and extend access to previously unserved or underserved SMEs. The following section takes a closer look at some promising financing instruments outside the traditional SME-bank relationship (thus referred to as ‘alternative’ financing instruments), namely mobile money (including instant loan services), crowdfunding (including P2P lending) and private equity. Main objective is to contrast the narrative around the potential and opportunities of these instruments with their actual performance in the market – as some sort of reality check in a manner of speaking. For every alternative financing instrument, this section briefly discusses its background, associated opportunities, challenges and obstacles in Africa as well as the current market size and trends of the instrument (some providers are exemplarily introduced in the Appendix).

The figures about the market size provide some useful indications of the relevance and future of the respective instruments, but must be taken with caution. On the one hand, data on FinTech and their products cannot match the quality of conventional bank data with regard to comprehensiveness and homogeneity. This applies for more advanced markets such as Europe (Demertzis et al., 2018) and is even more relevant for Sub-Saharan Africa. On the other hand, systematic and academic research is still very limited with regard to FinTech activities (Zalan & Toufaily, 2017), so that this section has to additionally rely on analyses from banks and consultants.

In fact, the limited academic literature and the relevance of the respective financial instruments in Sub-Saharan Africa have influenced the choice of the alternative instruments discussed in this section. Crowdfunding and payment systems (i.e. mobile money such as M-Pesa) were identified as notable exceptions where some literature with a theoretical and empirical foundation exists (Zalan & Toufaily, 2017). These two instruments have thus been included in this paper and are being complemented by a risk-financing tool (equity) to do some justice to the diverse financing needs of different SMEs.<sup>5</sup> Most alternative financing instruments have been developed in other national contexts since investment in the FinTech

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4 There has been a recent slowdown in growth mainly driven by regulatory changes in China that plummeted national FinTech lendings (Claessens et al., 2018).

5 Equity is less tech-enabled than mobile money or crowdfunding, but stock exchanges also benefit from digitalisation as reduced transaction costs allow e.g. for cost efficiencies and handling of larger volumes of smaller-value transactions.

industry almost entirely takes place in the Asia-Pacific region, North America and Europe (see Box 3) (Barreto et al., 2019b). Bruton, Khavul, Siegel, and Wright (2015) find that “new financial alternatives [...] were originally shaped by their institutional roots but are now diverging and adapting to new settings”. They particularly highlight crowdfunding and P2P lending as good examples for such an evolution and migration to other regions – another reason for discussing these specific instruments here with respect to the SSA region.

#### 4.1 Mobile money and digital credit

Digital innovation changes the financial infrastructure across Africa. Access to bank accounts and financial institutions in Sub-Saharan Africa remains rather limited. On the other hand, mobile phone penetration is strong and steadily increasing. Financial service providers have made use of mobile money to fill the infrastructural gap.

##### *Background*

Mobile money is a technological instrument which enables customers to use mobile phones for financial services. This paper uses the term ‘mobile money’ referring to the entire range of mobile-money-enabled financial services. The most basic services include transmitting or receiving money from other users and saving options. More enhanced services were added to complement these basic services, for instance, the provision of small loans or insurance. Since the rise of the mobile money market in 2007, most services were offered as a partnership between a dominating mobile network operator (MNO) cooperating with a bank as the holder of funds and customer accounts. Although FinTechs and some banks are gaining power on this market, MNOs still dominate here. The two market leaders in Africa are M-Pesa and MTN Mobile Money (for more details, see Mobile money examples in the Appendix) (Chironga, De Grandis, & Zouaoui, 2017).

Chironga et al. (2017) distinguish three different types of partnerships between MNOs and banks providing mobile money systems. The MNO-dominant provider type is defined by an MNO who undertakes most work throughout the network and partners with a bank as a deposit holder. The second provider type is an MNO-led partnership with a stronger bank influence compared to the first model. The mobile money account can be directly used to apply for additional banking services, such as small instant loans. These digital credits are provided based on an analysis of the client’s mobile data such as mobile money transactions, payment and saving histories. They target private consumers as well as MSMEs by offering attractive conditions such as easy accessibility, low requirements and instant availability. The third classification type is the bank-led partnership model. Compared to the previous, the bank is in a more dominant position, offering not only additional services, such as loans or other financial products, but also taking the lead in the network access and processing of payments.

##### *Opportunities*

Mobile money encounters favourable market conditions in many African countries and offers affordable and convenient digital financial services. On the one hand, the coverage of conventional financial services is relatively low in the region. About 40 per cent of adults in SSA had a bank account in 2017 and only 15 per cent of the adult population actively

used their account (World Bank, 2018). On the other hand, the mobile phone penetration in SSA is almost twice as high as bank account penetration, and projected to rise from 74 per cent in 2018 to 85 per cent in 2025 (GSMA, 2019). Chironga et al. (2017) emphasise that mobile money providers managed to take advantage of this fertile setting by offering superior customer service: mobile money services are easy to access and offer transactions and even more advanced financial services with less effort, requirements and transaction costs compared to conventional banks. In addition, mobile money providers profited from network effects and economies of scale, as a few big players dominated the market: the top five MNOs account for 60 per cent of total customers, while the top five banking institutions account for only 22 per cent of all bank accounts (Chironga et al., 2017).

Mobile money services basically embody all of the opportunities given for digitalisation in Section 3.1: They have far lower transaction costs at every stage of the process, allow for better screening and credit assessment, allow lowering risk and default, remove collateral requirements, spark competition in the financial system, overcome high costs for financial services including application processes, and increase customer convenience and simplify service provision. Hence, mobile money substantially advances the financial deepening with potential spillover effects on the wider economy such as inclusive development and job creation (see Melia (2019) for a good overview of the evidence on these interactions). However, the following paragraphs lay out that mobile money creates further opportunities that range from integrated, cross-MNO and cross-border transactions in Africa via compatibility with service providers of worldwide cash transfers, new credit scoring algorithms and services, to the facilitation of the development and emergence of other digital financing instruments.

Market integration is fostered by mobile money as it facilitates transfers and payments across different MNO operators and across borders. The market has become more connected as cooperation between mobile money providers are emerging throughout Africa. One example is the joint venture between MTN and Orange, called Mowali (mobile wallet interoperability), which was announced in November of 2018 (Orange, 2018). Furthermore, both market leaders M-Pesa and MTN signed an agreement in 2018 to ensure compatibility of transactions between the systems in 19 countries. All of these developments increase interoperability between different providers.

Mobile money is also compatible with international cash transfer systems. Some mobile money service providers expand their system through cooperation with internationally operating cash transfer systems. Western Union, for example, partners with several mobile money providers, such as M-Pesa, MTN, Tigo and airtel, to enable customers to move funds between the different accounts for a modest fee (Airtel; Western Union, 2010, 2012, 2018), which holds promising potential for remittance flows. Other international cash transfer providers such as PayPal have taken a similar approach (PayPal).

New credit scoring algorithms use mobile money apps to mitigate the problem of asymmetric information in SME lending. Due to rising smartphone penetration, innovative digital finance providers developed more sophisticated credit scoring systems that also exploit alternative data beyond financial transactions, savings and credits. This may encompass calls and messages, locations visited, social network activities, online market places and other aspects. The report on alternative data for SME finance by the International Finance Corporation (2017) offers an excellent insight into these developments: In a

nutshell, most advanced digital players use the digital footprint of (potential) borrowers as a rich source of data that is automatically tapped to feed the algorithm that analyses creditworthiness. And even less sophisticated digital service providers manage to accumulate enough information to overcome traditional SME financing issues of firm opaqueness, most prominently lack of financial statements, credit bureau information and collateral.

Some FinTechs even take on the task of providing credit information, or more accurately, information about creditworthiness and default risk as a service for other financial institutions. They use mobile phone data to calculate the probability of default and the creditworthiness and offer the resulting credit score information to other financial service providers. Peru-based Entrepreneurial Finance Lab and US-based First Access, for example, are two credit score providers for banks and other lending institutions. Both FinTechs focus on LMICs in Asia, Africa and Latin America (International Finance Corporation, 2017).

Lastly, mobile money takes on some features of a foundational technology with regard to other financial instruments: It has the potential to change the financing landscape and to act as a building block that facilitates the development and emergence of other financial instruments. Besides offering digital credits, mobile money services play an important role for other financing instruments in Africa fostering their emergence, spread and outreach. As described subsequently, some finance instruments, such as crowdfunding platforms adapted services to address the lack of savings accounts at formal financial institutions by alternatively allowing the use of mobile money.

### *Challenges*

A major concern is the legal framework for the mobile money industry. Arguments are similar to the ones presented in Section 3.2 on the challenges of digitalisation in SME finance: Regulators have to protect data privacy, ensure cybersecurity, rule out malicious practices in data collection, transparency, reporting and avoid exploitative financialisation.

To some extent, mobile money services suffer from the same problems as conventional financial products. For instance, the usage of mobile money accounts in SSA is also significantly lower compared to the number of people holding an account, with only one third of accounts showing any transactions in the last 90 days (GSMA, 2018).

One additional problem of mobile money is the widening gap to a small group of disadvantaged people. This argument has been introduced above as a general challenge for digitalisation. However, it especially concerns mobile money, as this technology claims wide applicability among households and firms while other digital financial instruments such as crowdfunding and risk financing target specific financing needs of a certain sub-segment of SMEs (and not or only to a minor degree those of households). Hence, the concern of leaving certain disadvantaged groups behind is particularly profound for mobile money. And indeed, comparing the demographics of mobile money account holders points at, on the one hand, substantial gaps opening between urban and rural areas (e.g. in Benin 6% vs. 18%, in Ghana 18% vs. 23%, in Kenya 46% vs. 81%, in Rwanda 18% vs. 46%, in Tanzania 48% vs. 72% and in Uganda 40% vs. 63% according to Financial Inclusion Insights surveys presented in the report of the Alliance for Financial Inclusion (2018)), and



on the other hand between men and women with a gender gap of 19.5 percentage points in 2016 (GSMA, 2017).

### *Obstacles in Africa*

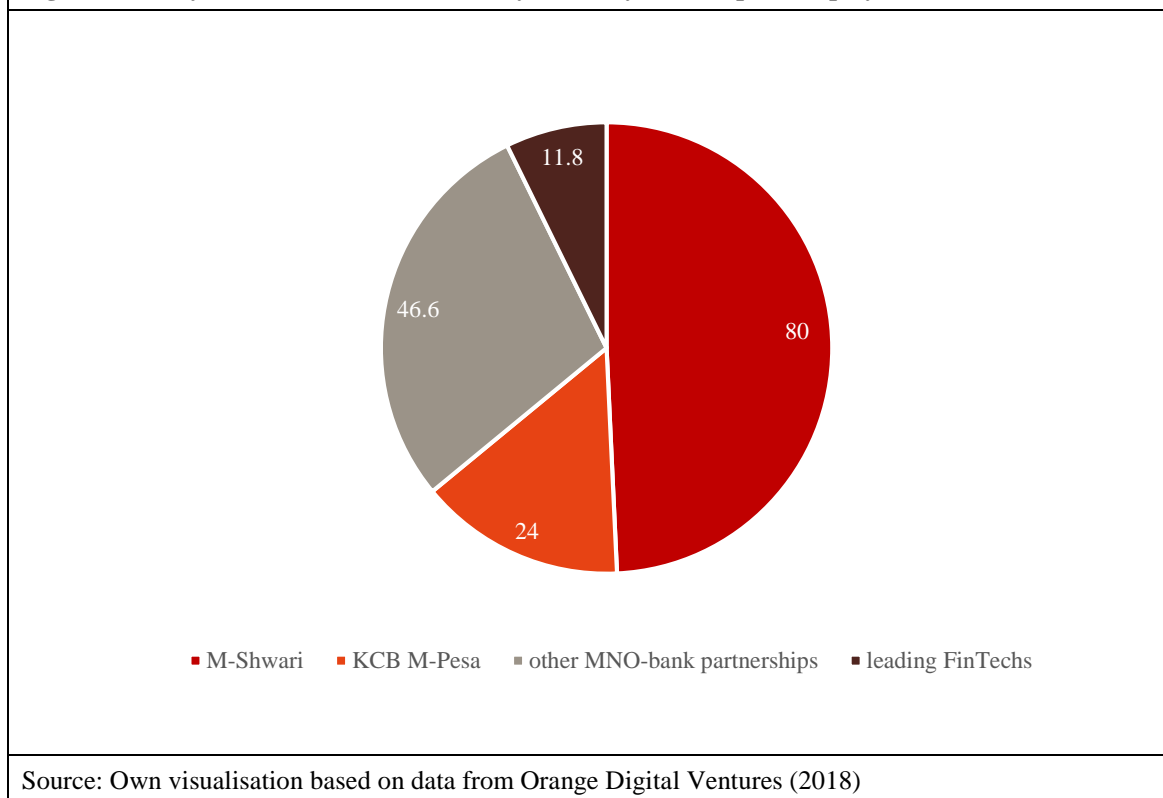
In the mobile money market, Africa is ahead of the rest of the world. The deployment of mobile payment services, for example, are highest in Sub-Saharan Africa (EIB, 2018). Consumers are ready to adopt new technological solutions and exhibit favourable preferences. However, the industry needs to take the next steps and move from payment-service-centred business models to more comprehensive forms of intermediation (EIB, 2018). Mobile money services need to offer the full range of savings, credit and insurance products such that the usage of these instruments becomes more widespread. At the same time, the industry needs to safeguard its integrity and stability. EIB (2018) reported that non-performing loans have been on the rise. This development has been associated with the FinTech industry and particularly with small digital credits with short maturities. It is crucial to closely monitor this trend in order to take regulatory measures if necessary.<sup>6</sup>

### *Market size and trends*

Even though digital credit is growing quickly in some mature markets in Africa such as Kenya, Tanzania, Uganda and parts of West Africa (Alliance for Financial Inclusion, 2018), the value of digital credit remains marginal compared to overall lending. Data on mobile money credits is scarce so that only figures for Kenya as African market leader are reported, having to serve as an example. Among the most important players of the Kenyan market for digital credit, ‘real’ FinTechs still play a minor role with a credit portfolio of USD 11.8 million compared to USD 104 million of the two market leaders M-Shwari and KCB M-Pesa (see Figure 2) (Orange Digital Ventures, 2018). The two ‘incumbent innovators’ are partnerships between MNOs and banks that target private consumers and also MSMEs with their mobile phone data-enabled digital credits. Both products work similarly, but the KCB M-Pesa credits are more suitable for MSMEs due to longer repayment periods and loan sizes of up to USD 10,000 (International Finance Corporation, 2017). Even if the number of mobile-money loans has surpassed the number of conventional loans (MicroSave Consulting, 2019), SME loans from banks amounting to more than USD 3 billion (Berg, Furchs, Ramrattan, Totolo, & Central Bank of Kenya, 2015) still play in a different league than the USD 150.6 million in digital credits (Orange Digital Ventures, 2018).

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6 Note that the proportion of digital credits to overall lending is too small to seriously cause stability risks to the financial system. Some even argue that mobile money can contribute to increased monetary and financial stability as it enables more effective monetary policy: First, mobile money brings currency and assets into the financial system, which raises financial depth, the money multiplier, and thus the effectiveness of monetary policy. Second, the spread of mobile money is associated with increased conventional commercial banking such that more economic activity falls under the control of central banks (Kipkemboi & Bahia, 2019). Whether such effects are significant and outweigh the adverse effects of the currently degrading quality in the loan portfolio has to be seen. It can only be said that, so far, there is no evidence that mobile money already negatively affects inflation or stability of the financial system.

**Figure 2: Kenyan market for mobile-money credit by most important players (in million USD)**

In the following, the focus is on mobile money accounts as a proxy for the rise of mobile money usage in Africa. After all, this data is more readily available for the African continent than digital credit data. In 2018, the 396 million registered mobile money accounts in Sub-Saharan Africa represent roughly two thirds of the adult population having access to such an account. This easily exceeds the number of conventional bank accounts and even accounts for almost half of the mobile money accounts worldwide (GSMA, 2019). Having risen from 277 million mobile money accounts in 2016 (GSMA, 2017), this implies a CAGR of about 20 per cent over the period from 2016 to 2018. These figures emphasise that the market is large, but still expanding rapidly.

However, despite impressive absolute numbers of mobile money account ownership, there is persisting variation in financial inclusion. Chironga et al. (2017) describe the mobile money markets in East Africa and Ghana as the most developed markets in Africa. They identify a high share of African countries with a quickly emerging mobile money market, for example, Zimbabwe, Botswana, Cote d'Ivoire and Zambia. On the other hand, coverage of mobile money accounts is low, and there has not been significant growth in Nigeria, Egypt and Morocco. Chironga et al. (2017) trace the lack of expansion of mobile money accounts in these three countries back to a more developed conventional financial system and regulatory constraints.

Differences across countries in mobile money penetration are further highlighted by the European Investment Bank. While in Kenya 80 per cent of the adult population holds a mobile money or conventional account, only 10 per cent of the Burundians enjoy the same conditions (EIB, 2018). Countries with a high mobile money usage (active accounts exceeding 40% of the adult population) are Kenya, Tanzania, Zimbabwe, Ghana, Uganda, Gabon and Namibia (EIB, 2017). More recent figures further underline the progress being

made. In 2018, many of these countries had already grown beyond a penetration rate of 60 per cent: The report of GSMA (2019) highlights that an increasing number of countries have provided more than 60 per cent of the adult population with such an account, for instance, Ghana, Kenya and Zimbabwe.

## 4.2 Crowdfunding

### *Background*

Crowdfunding is a financing method that involves a large number of funders, the ‘crowd’. Raised funds are made up of small investments from a variety of individual backers. Projects and potential backers mostly connect via online platforms without standard financial intermediaries (Mollick, 2014). Providers, who established these platforms, mainly act as facilitators and intermediaries who connect projects and investors (Belleflamme, Omrani, & Peitz, 2015).

Funded projects include financial needs for private household consumption, funding of social projects, or SME-related projects such as new product development, purchase of stock inputs for expansions and other business activities. Funding terms, as well as investor rewards, vary between different models of crowdfunding. Bradford (2012) distinguishes five different legal types of crowdfunding platforms according to the type of return provided to the financial backers:

- donation-based: Project initiators provide no compensation. Funded money is a donation to support the project. This type is often used for charitable projects.
- rewards-based: Financial backers are compensated with a reward, which is a non-monetary return.
- pre-purchase model<sup>7</sup>: The project initiator funds the production of particular goods. The provided funds are the payment for the pre-ordered product.
- debt- or lending-based; also known as peer-to-peer (P2P) lending: Financial backers provide a fund in the form of a loan and receive the repayment of instalments and an additional interest rate.
- equity-based: The investment is compensated by equity shares of the project/venture.

Only the latter two crowdfunding types involve the idea of generating financial profits. However, all types have in common that compared to more conventional investments, financial means are derived from a range of backers.

Funding mechanisms on these platforms are often based on a minimum target amount or an all-or-nothing principle, and come with a fixed time frame to attract investors (see e.g. Mollick, 2014). According to these principles, projects only receive funding if the raised sum meets the overall targeted investment sum or a lower minimum threshold, which

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<sup>7</sup> Pre-purchase crowdfunding is sometimes subsumed as a sub-category of reward-based crowdfunding.

ensures the practicability of the project. If the project cannot reach its target within the given time frame, the collected sum goes back to the investors. Each project initiator sets a funding goal within the default maximum and minimum amount given by the platform providers. Another principle used by crowdfunding platforms is the keep-what-you-raise approach. In this case, there is no threshold which needs to be reached. The project initiator receives all of the funds which have been collected within the set time frame. Typically, the time frame for projects to raise money ranges from 30 to 90 days.

### *Opportunities*

One of the main advantages of crowdfunding is that it enables small businesses, that would otherwise not have access to finance, to receive external finance. Crowdfunding platforms can cater to businesses who are rejected by conventional financial institutions because they lack collateral and have no track records of profitability (Sigar, 2012). Furthermore, it reduces geographical barriers in accessing funding. Crowdfunding enables project initiators to not only reach out to local investors, but also to ones all over the world (Bechter, Jentzsch, & Frey, 2011).

Besides raising funds, the platforms enable initiators to raise awareness for their project or company and to build up a network. Projects as well as micro and small enterprises have the opportunity to make themselves visible to the wider public and to test the market potential of their new products. The important feature is that crowdfunding cuts out the institutional intermediary and allows to directly connect to a potential target group of consumers. If a product or initiative attracts many investors, it is more likely to turn into a successful start-up (Ramsey, 2012). Furthermore, crowdfunding enables project initiators to build up a network, as backers are generally interested in the success of the project and may follow the further development of the firm. A great crowd of backers increases the number of potential supporters and partners, which may come with important financial and non-financial benefits in the future (FSD Africa & AlliedCrowds, 2016).

Lastly, FSD Africa and AlliedCrowds (2016) point out that project initiators who benefit from a crowdfunding campaign are requested to provide updated information on the progress of the project. The authors conclude that this mechanism not only strengthens the relationship between the beneficiary and donor/lender, but can also serve as a “preliminary evaluation mechanism”.

### *Challenges*

A challenge for crowdfunding platform providers and investors is in coping with the potentially fraudulent behaviour of applicants. This problem arises when there is no clear legal obligation from project initiators to deliver their promised rewards and activities (Mollick, 2014). P2P loans and other crowdfunding rewards are unsecured and not backed or guaranteed by assets, which increases the risks for investors. But this very feature also increases the accessibility of the instrument for enterprises and households.

For small enterprises, one critical point is the necessity to publicly share new product and project ideas on the crowdfunding platform. Bechter et al. (2011) point at the potential risk of larger competitors stealing business ideas. Project initiators are generally not in a position to sue such adversary firms because of limited capabilities and resources.

Furthermore, Sigar (2012) states that there is a trust issue on the side of the applicant as well as the investor to choose a reliable platform as an intermediary. For both parties, distinguishing reliable from non-reliable providers on the Internet is difficult.

### *Obstacles in Africa*

The legal framework, financial infrastructure and business environment in Africa differ from the top crowdfunding locations such as the US, Asia and Europe. As already pointed out in Section 4.1, ownership of a bank account, for example, is rather low compared to high-income countries (HICs) and varies a lot across African countries. Therefore, crowdfunding platforms dedicated to or allowing for African projects face different or additional challenges.

Local crowdfunding platforms are better positioned to adjust to the local infrastructure and enable the use of all crowdfunding functions without having an internet access or a formal bank account. M-Changa, for example, is a Kenyan-based platform which integrated the more widespread mobile money technology into its services. M-Changa cooperates with internet-based payment services and mobile money providers to allow Kenyan households as well as micro and small enterprises to raise funding without a bank account. The mobile fundraising option can even reach individuals without internet access.

Challenges also arise in terms of weak or missing legislation and regulation to protect the rights of providers and users of crowdfunding platforms. A regulatory framework is crucial for equity- and loan-based crowdfunding platforms to protect backers' rights. A dedicated legal framework for crowdfunding also creates certainty and protection for platforms and enterprises which would otherwise operate in unregulated grey areas. Stable and reliable legal frameworks provide the necessary certainty for crowdfunding platforms to set themselves up, undertake investments and attract investors.

In addition, missing legislation hampers the growth of the crowdfunding market in general and the development of national platforms in particular. Initiatives and governmental efforts to address issues related to the legal framework have been limited (Afrikstart, 2016; Cambridge Centre for Alternative Finance & FSD Africa, 2017). Being aware of this, the African Crowdfunding Association (ACfA) was launched in 2015 to create a lobby and push for a legal framework. And while the US has enacted laws on the regulation of crowdfunding platforms via the Jumpstart Our Business Startups (JOBS) Act in 2016, there were still no regulations dedicated to crowdfunding in Africa until 2016 according to Cambridge Centre for Alternative Finance and FSD Africa (2017). The report of Cambridge Centre for Alternative Finance (2018) suggests that there have been some changes in at least one country recently: While more than half of the surveyed platform providers indicate that there is, indeed, no specific regulation and 21 per cent state that crowdfunding and P2P lending are not legalised in their countries, the remaining quarter does acknowledge that some regulatory framework for crowdfunding exists in their country.

A report about the East African crowdfunding infrastructure by FSD Africa and AlliedCrowds (2016) points out that what mainly inhibits the emergence of local platforms

is the lack of regulations.<sup>8</sup> Consequently, most lending- and equity-based platforms operating in African countries are based abroad and make use of the more sophisticated crowdfunding legislation in the US, the UK, France or Germany (FSD Africa & AlliedCrowds, 2016). Even though internationally operating platforms provide some alleviation against crowdfunding bottlenecks, challenges still remain: First, international platforms need to set up a cooperation with local partners to manage payments and disburse the raised funds. Second, some foreign platforms such as the German-based Betterplace and the US-based GoFundMe require project initiators to have German or US-American citizenship, respectively, thereby excluding African citizens from starting a fundraising campaign on these platforms. Third, international platforms are highly unlikely to adapt their services to local realities, for instance, offering the above-mentioned offline and mobile money solutions. The need for national crowdfunding legislation and more African-based platforms also becomes clear in the next sub-section that addresses the state of crowdfunding in Africa.

### *Market size and trends*

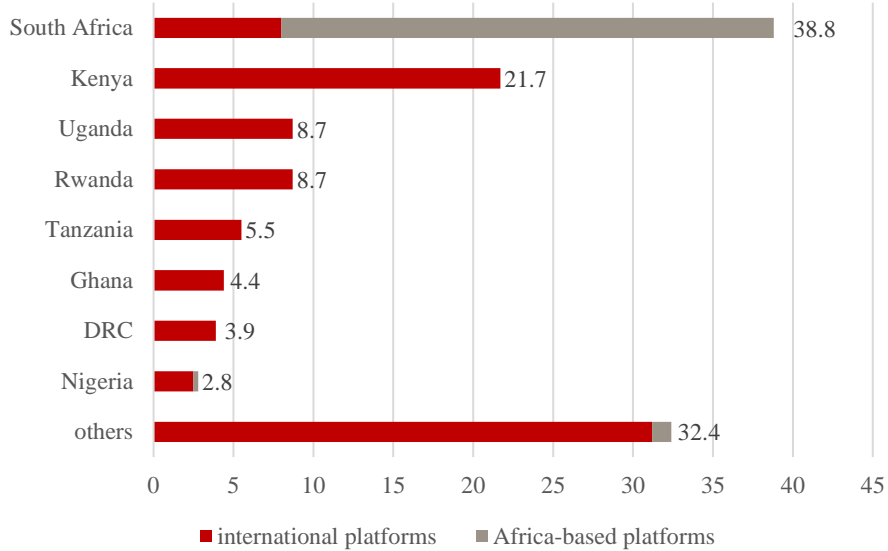
Cai (2018) summarises that the amount raised worldwide through crowdfunding increased from USD 1.5 billion in 2011 to over USD 300 billion in 2016. Slightly different figures from the crowdfunding report of the Cambridge Centre for Alternative Finance and FSD Africa (2017) reveal that especially in the US, Europe and Asia, crowdfunding has become a widely accepted financial instrument: From over USD 145 billion raised in 2015 globally, over USD 100 billion are attributed to China, USD 36 billion to the US and about USD 5 billion to the UK.

At about USD 127 million, the volume of crowdfunding flowing into African countries was still very small in 2015 (Afrikstart, 2016). Still, the World Bank (2013) estimates a crowdfunding potential for Sub-Saharan Africa of USD 2.5 billion until 2025. Not only donors and backers are dominantly from Europe or America, but also most crowdfunding platforms operating in Africa are headquartered in the global North (FSD Africa & AlliedCrowds, 2016). As can be seen in Figure 3 and Figure 4, African projects raised USD 94.6 million (75% of total funds raised) in 2015 from non-African crowdfunding platforms, 51 per cent of which stemmed from donation-based platforms, 44 per cent from lending-based ones, and rewards-based and equity-based approaches just raised about 5 per cent (Afrikstart, 2016). A report of FSD Africa and AlliedCrowds (2016) on crowdfunding in East Africa mainly covers international platforms and presents similar numbers for the East African countries in 2015. The report highlights that the crowdfunding market experienced rapid growth of 170 per cent in the first quarter of 2016 compared to the same period in 2015.

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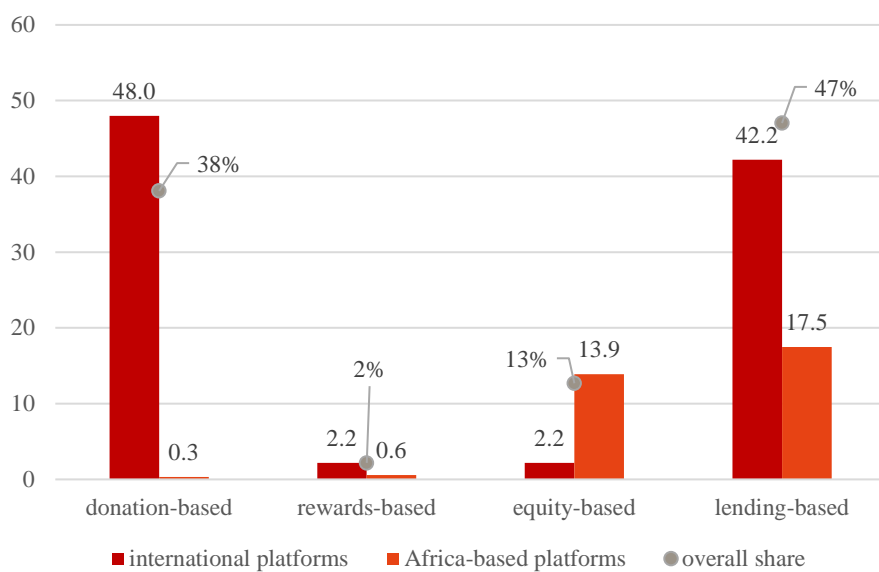
8 The Cambridge Centre for Alternative Finance (2018) finds that more than a third of surveyed platform providers complained that in their country no regulatory framework exists even though there is a need for it.

**Figure 3: Funds raised via crowdfunding by country (in million USD)**



Source: Authors' visualisation based on Afrikstart (2016)

**Figure 4: Funds raised by type of crowdfunding platform (in million USD) and overall share (in percent)**



Source: Authors' visualisation based on Afrikstart (2016)

Coming back to the entire African continent, the 57 Africa-based platforms<sup>9</sup> identified by Afrikstart (2016) raised a total amount of USD 32.3 million (25% of total funds raised) in 2015 with 54 per cent originating from lending-based platforms, 43 per cent from equity-based platforms, and only about 2 per cent from rewards-based and about 1 per cent from donation-based platforms (see Figure 4). Most of the funds are attributed to South Africa (USD 30.8 million) with subsequent countries such as Egypt and Nigeria not surpassing the threshold of USD 1 million, as shown in Figure 3. This indicates that in South Africa there is a greater awareness of crowdfunding instruments and a more conducive national ecosystem for such platforms. Although South Africa exhibits a more mature crowdfunding market compared to East-Africa, East-African countries were more successful in raising funds from international platforms.

African-based platforms seem to be more focused on financing MSMEs than foreign platforms. Funds raised at African-based platforms are almost entirely profit-oriented, i.e. come from equity- or lending-based crowdfunding platforms. International platforms, in contrast, raised more than half of the funds for the African projects on donation-based platforms. Unsurprisingly, social projects were the top-funded project type in 2015 in international crowdfunding platforms, while African-based platforms specifically funded business- and entrepreneurship-related projects with 55 per cent of funds raised on African-based platforms in 2015. While it is clear that African-based platforms are more focused on MSME finance, it is not clear which platform type is more important for the financing of African firms in absolute terms. Since the report does not provide a compilation by funding purposes for international platforms, it can only be said that the share of the for-profit raised funds of the USD 44.4 million that was raised internationally for MSME projects, is likely to surpass the USD 17.8 million of funds raised at African-based platforms for MSEMs.<sup>10</sup>

In order to capture trends for crowdfunding by African projects, data from the Cambridge Centre for Alternative Finance is presented in the following, even though it encompasses fewer crowdfunding platforms than the report from Afrikstart (2016). The data probably still catches the general trend of the market well. Definitions of crowdfunding vary widely across scholars and institutions. The Cambridge Centre for Alternative Finance (2018) seeks to measure “alternative finance” in Africa,<sup>11</sup> which mainly overlaps with our understanding of crowdfunding, but also includes some non-crowd-based financing sources such as invoice trading, balance sheet lending and securities. Considering only the data that matches our definition, it can be said that the crowdfunding market has started an impressive exponential growth trajectory from about USD 39 million in 2013 to about USD 148 million in 2016 (see Figure 5). The year-to-year growth rate has risen from 30 per cent in 2014 to 45 per cent in 2015 to an impressive 99 per cent in 2016. As the Cambridge Centre for Alternative Finance (2018) points out, further exponential growth can be expected, since the market has seen a close to three-digit growth rate for the first time.

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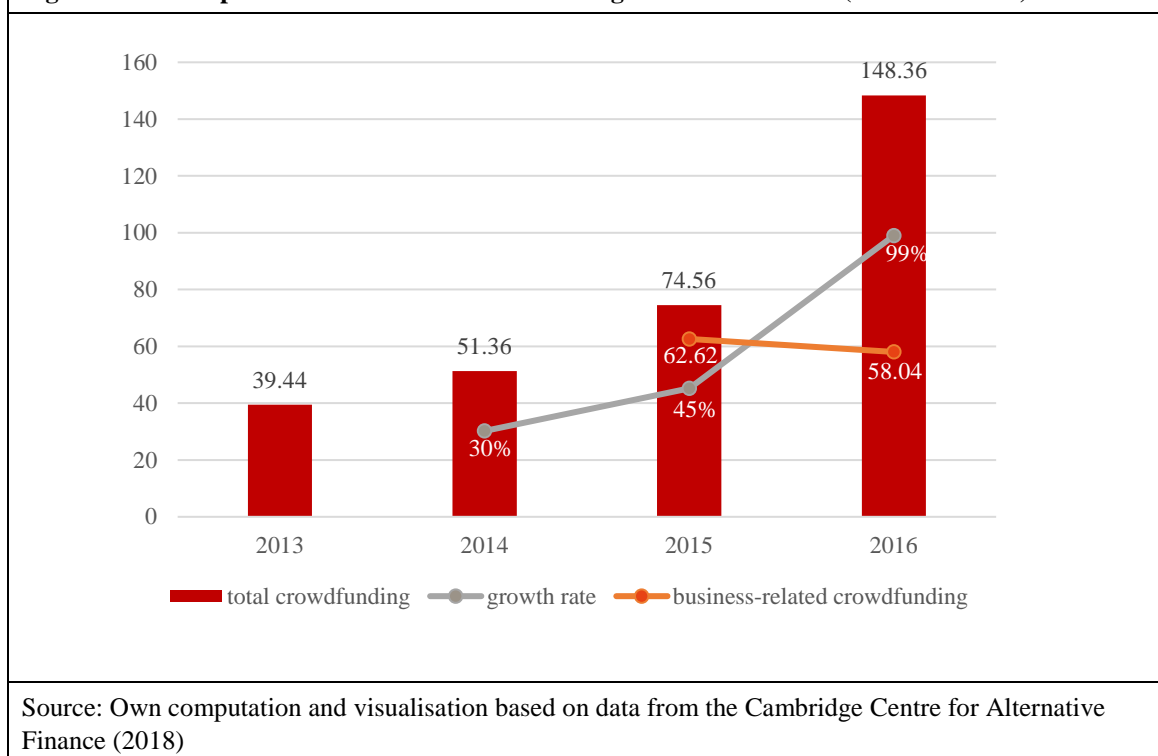
9 This number includes 23 platforms in Southern Africa (South Africa 21, Zimbabwe 2), 17 platforms in West Africa (Ghana 2, Ivory Coast 2, Nigeria 9, Senegal 2, Togo 2), 13 platforms in North Africa (Algeria 2, Egypt 5, Morocco 4, Tunisia 2,) and 4 platforms in East Africa (Kenya 2, Uganda 2).

10 This holds if the share of funds raised by MSMEs on international platforms amounts to at least 40 per cent. For comparison, it was 55 per cent for African-based platforms.

11 The report is highly recommended as reading about emerging, alternative financing instruments in Africa. It presents rich data about many facets and characteristics of the African market.



**Figure 5: Development of the African crowdfunding market 2013-2016 (in million USD)**



The overarching trends are mainly the same in the data from Afrikstart (2016) and the Cambridge Centre for Alternative Finance (2018), with the notable difference that Nigeria does not appear as a relevant crowdfunding market in the former report, but amasses USD 8 million in 2015 according to the Cambridge Centre for Alternative Finance (2018). Furthermore, the latter report suggests that West and Southern Africa experienced disproportional growth in 2016 and surpassed the slowly growing East African region in total funds raised (Cambridge Centre for Alternative Finance, 2017, 2018). Lastly, it has to be noted that the figures about business-related crowdfunding in Figure 5 are inflated since they contain the above-mentioned non-crowd-based financing instruments and since the report uses a very loose and wide-ranging definition of ‘business-related’ that also includes several non-entrepreneurial activities.

### 4.3 Equity

Equity is another alternative financing instrument outside the traditional SME-bank relationship. Even though they are less tech-enabled than mobile money or crowdfunding, stock exchanges also benefit from digitalisation. Interestingly, all African SME exchange boards have been established in the 2000s, i.e. in the digital era where reduced transaction costs allowed for cost efficiencies and handling of larger volumes of smaller-value transactions. Digital advances have most likely also facilitated the operations of SME stock exchanges and equity is thus included here as a risk-financing instrument to account for the diverse financing needs of different SMEs.

## *Background*

Issuing equity shares is an additional opportunity for firms to raise capital and share risk. In the equity market, investors buy a defined share of ownership in the form of stocks to benefit from future profits and increasing value of the firm. Ownership lets investors have a part in successful company development by dividend payments and rise in the value of stocks, but they do also share the full economic risk in case of default. Firms, on the other hand, give up some degree of firm ownership and profits in order to obtain long-term finance without repayment obligations.

Equity financing can be divided into venture capital, private and public equity. The main difference being that shares of public equity can be freely traded between investors on well-established secondary markets, which increases liquidity of the investments. Venture capital and private equity investments are not traded publicly on stock exchanges. Instead, investors directly interact with the enterprises. While venture capital and private equity is more suitable for early-stage financing and hands-on investors ready to interact more closely with the management, public equity targets a broader set of public and institutional investors with less investor influence on the enterprise.

SMEs have a hard time meeting the listing requirements and covering the costs such that some stock exchanges have launched special SME exchange markets. To become publicly listed on a stock exchange market, companies have to fulfil a list of criteria defined by the stock exchange's authority for an IPO (initial public offering). These criteria vary between different stock exchanges and typically include capital requirements, size of the enterprise, profit history and previous issuing of shares. Although exchange markets are in general open to SMEs, smaller firms may be discouraged by the daunting requirements and the associated listing fees (Nassr & Wehinger, 2016). In response, some exchange markets have set up a board devoted to SMEs that offers listing aside from the main board. These SME exchange markets have lower pre-listing requirements, in particular lower or no minimum capital requirements, lower profitability requirements and lower fees (WFE, 2017, 2018). This option especially suits financially constrained SMEs characterised by strong growth potential that has not yet been materialised into large regular cash flows (Harwood & Konidaris, 2015; Nassr & Wehinger, 2016).

## *Opportunities*

The primary benefit of equity is that firms can raise long-term finance and share entrepreneurial risk. Risk finance through equity may be the only option for some small and innovative firms with high growth potential but limited collateral and no track record. Yet issuing securities may have further positive effects: Listing on stock exchanges target a broad and diverse base of investors and can thus be more cost effective than other forms of external finance for certain enterprises (WFE, 2017). In addition, IPOs offer early investors and equity holders an exit option making initial investments more attractive. Listing also raises the firm's visibility as well as the transparency in terms of financial performance and may thus improve creditworthiness and access to debt finance (Harwood & Konidaris, 2015). Dedicated SME exchanges with lower listing requirements facilitate the access for SMEs to this form of finance and its subsequent benefits. They can pave the way for graduation to the main board and for the extension of equity options as exchange markets allow or even subsidise this move (Harwood & Konidaris, 2015; WFE & Milken Institute, 2017).

The motives why SMEs become listed on stock exchanges reflect these multitude of potential benefits. Bearing in mind that motivation does not necessarily imply realisation of benefits, a survey on SME exchanges in five countries<sup>12</sup> by WFE and Milken Institute (2017) asked SMEs to choose their primary reason for listing from a selection of options (allowing for multiple answers): More than half of the firms mentioned setting up for growth, accessing lower-cost financing and diversifying the investor base. Almost half of the them named improved creditworthiness or visibility and brand reputation as primary motive.

A similar question was analysed in the African context by the African Securities Exchanges Association (ASEA) shifting the unit of analysis from firms to exchanges and asking for the primary motive through an open-ended question. The association surveyed 15 out of its 27 member exchanges,<sup>13</sup> 12 of which have dedicated SME exchanges (for more information on the national stock exchanges, see Table A1 in the Appendix). According to the surveyed stock exchanges, key reasons for SMEs' listing (37 per cent) are of a financial nature (e.g. raising long-term capital, overcoming borrowing constraints or strengthening the balance sheet), followed by marketing (e.g. visibility, enhanced status) and corporate governance (e.g. increased transparency, exit opportunity for initial investors and tax benefits) each coming in at 18 per cent.

To date, evidence from reliable empirical studies on the effect of SME exchange markets on SMEs is still lacking. A study by Aggarwal and Thomas (2017) about SMEs in the Indian stock exchange has flaws, most importantly a very small sample of 54 listed firms, so that results have to be read with caution. The findings suggest that three years after the listing, asset size and capital structure improve, but firm performance and access to debt finance at formal financial institutions does not differ from that of similar unlisted firms. Further studies are needed to be able to assess the impact of SME stock exchanges and which of the above benefits actually materialise.

### *Challenges*

Listing on an exchange market imposes not only direct costs such as fees, advisory expenses and brokers' commissions, but also indirect costs on the issuing firms. These include adjustment to and compliance with requirements and potential disadvantages through disclosure of relatively sensitive company information and fluctuating prices of the company's shares (Nassr & Wehinger, 2016). Firms need to have an adequate level of institutionalisation to cope with the reporting and corporate governance requirements. These challenges underline once more that public listing, even on dedicated exchange markets, is not appropriate for all SMEs (OECD, 2016). Interestingly, some SMEs also have fundamental criticisms about dilution of ownership, in other words the fear of losing total ownership and being overpowered by third parties (WFE & Milken Institute, 2017).

Stock exchanges in LMICs struggle to reach the critical size on the supply side (firm listings, value of issued stocks) and on the demand side (investors and market liquidity) to run

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12 The survey included answers from listed and unlisted companies in China, Canada, India, Jamaica and South Africa.

13 Member exchanges who participated in the survey were: Botswana, Cameroon, Egypt, Kenya, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Seychelles, South Africa, Sudan, Swaziland, Zambia and Zimbabwe.

smoothly and efficiently. Exchange markets are only suitable for SMEs with a strong growth potential in the first place (Nassr & Wehinger, 2016). However, a sufficient number of SMEs with strong growth perspectives and the willingness to seek equity financing is a necessary precondition before a national exchange sees the business case for launching a dedicated SME exchange market. Several countries do not have sufficient pipelines of such SMEs, and even in countries where SME exchanges have started operations, several have problems to attract eligible enterprises (Harwood & Konidaris, 2015).

On the demand side, liquidity is a key challenge for SME exchange markets. Insufficient liquidity erodes several of the benefits of stock markets: for example, it inhibits graduation to the main board, makes equity financing costlier for the enterprises and reduces the attractiveness of stocks for investors (WFE, 2018). If the liquidity of a market is too low, investors abstain from buying large stakes because of the limited or non-existent exit options and the inability to freely choose when to sell shares. According to the WFE (2018), that surveyed 33 of its member exchanges, 40 per cent of these exchange markets exhibited low market liquidity with a turnover velocity ratio of less than 15 per cent (i.e. value of traded shares in one year amounting to 15 per cent of the value of all stocks in the market). Yet liquidity varies strongly across markets and especially exchange markets in the Asia-Pacific region perform well, with a turnover velocity ratio of 100 per cent. The WFE (2018) finds that several of its member exchanges try to address the liquidity problem by requiring a minimum free float threshold. Possible alternatives are improved standardisation and homogeneity in order to facilitate trading speed as well as policy measures to support the SME sector (Nassr & Wehinger, 2016). Harwood and Konidaris (2015) argue that low liquidity may indicate the need for small specialised intermediaries. According to them, big intermediaries are often not interested in the small and riskier SME exchange markets, where screening them requires almost the same time as larger listings such that transaction costs are higher in relative terms. Smaller specialised intermediaries that bundle SME stocks to reach scale can be paired with investment banks to create a profitable multi-broker system.

### *Obstacles in Africa*

Challenges in Africa are not much different from the obstacles discussed above. Little market activity, few listed enterprises and lack of liquidity of the shares create problems in LMICs even at the main board and the situation in the smaller SME exchanges is even bleaker, which deters investments (Harwood & Konidaris, 2015). African SME exchange markets surveyed in the study of the African Securities Exchange Association ASEA (2018) pointed at the financial burden of an IPO, insufficient liquidity and collateral as well as low returns as the key challenge associated with listing; each factor is mentioned by 22 per cent of surveyed exchanges as the single main challenge. This does not differ much from results in other regions of the world (WFE & Milken Institute, 2017).

### *Market size and trends*

According to the World Federation of Exchanges (WFE, 2018), there are 33 SME stock markets globally across its 29 member exchanges as of December 2017.<sup>14</sup> At that point there were 6,807 enterprises listed on the SME exchange markets with a total capitalisation of USD 1.3 trillion. Most SMEs (61%) were listed in the Asia Pacific region, accounting for the major share (93%) of total capitalisation. The EMEA (Europe, Middle East, Africa) region's SMEs represented 10 per cent of listed enterprises and contributed about 3 per cent to the total capitalisation. Compared to the capitalisation in the overall stock market, SME exchanges are (still) tiny and account for less than one per cent of total market capitalisation in two thirds of the stock markets (WFE, 2018).

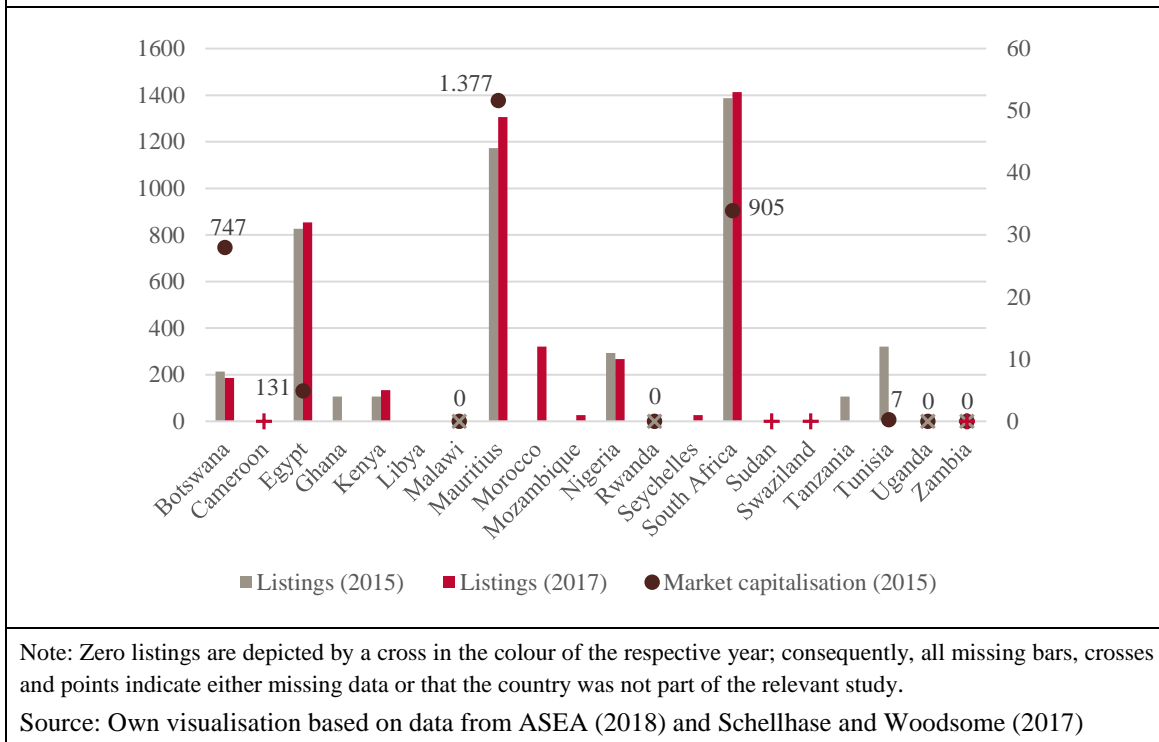
When focusing on the African market, more than 70 per cent of the stock exchanges have a dedicated SME board with a total capitalisation of about USD 3.2 billion (total capitalisation only includes 9 of the 28 exchanges due to data availability; see Figure 6 or Table in the Appendix), but listings and capitalisation differ significantly. Most recent numbers are from December 2017 and presented by the ASEA (2018) study: 20<sup>15</sup> out of the 28 exchanges across African countries have dedicated SME boards. Out of the 15 African exchanges that participated in the ASEA survey, 12 have dedicated SME boards, 9 of which actually have firm listings (see Table A1). As depicted in Figure 6, the number of listed firms varies substantially across exchange markets, with the South African Alternative Exchange (AltX) (53 listings), the Mauritian Development & Enterprise Market (MDEM) (49 listings) and the Egyptian Nile Stock Exchange (NILEX) (32 listings) in the top three. At the bottom is Mozambique's SME board SENCOND Market (1 listing).

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<sup>14</sup> The World Federation of Exchanges is an international representation of stock exchanges worldwide. The WFE has multilateral exchange associations as subdivision, including among others the African Securities Exchanges Association (ASEA). Further subdivisions are the Asian and Oceanian Stock Exchanges Federation (AOSEF), the Federation of Euro-Asian Stock Exchanges (FEAS), Federation of European Securities Exchanges (FESE), Ibero-American Federation of Exchanges (FIAB), South Asian Federation of Exchanges (SAFE) and the Union of Arab Stock Exchanges.

<sup>15</sup> ASEA (2018) mention 19 SME exchanges since they did not count the Tanzanian SME exchange Enterprise Growth Market (EGM). No justification is provided for the exclusion. Yet the EGM targets SMEs and Schellhase and Woodsome (2017) do count it as an SME exchange. Hence, this paper considers the EGM as SME exchange market and thus counts 20 dedicated SME exchanges among the 28 African exchanges.

**Figure 6: African SME exchanges, market capitalisation in 2015 (in million USD; left axis) and listings in 2015 and 2017 (right axis)**



The Milken Institute provides a report with comparable data from December 2015 (Schellhase & Woodsome, 2017). It draws a similar picture with regard to the distribution of SME listings, but additionally reports on market capitalisation. These figures underline that the value of SMEs' shares differ significantly so that the number of listings does not go hand in hand with capitalisation. Contrary to the ranking by number of SME listings, the MDEM from Mauritius, for instance, tops South Africa's AltX, and Botswana's Venture Capital Board easily surpasses Egypt's NILEX in market capitalisation.

According to the development of firm listings, the African SME exchange markets have been stagnant between 2015 and 2017 (based on the available data from 7 of 28 countries). Bearing in mind that listings and market capitalisation are not perfectly correlated, we exploit the listings of the seven countries (Botswana, Egypt, Kenya, Mauritius, Nigeria, South Africa and Zambia) that have provided data for the studies of the Milken Institute in 2015 (Schellhase & Woodsome, 2017) and the ASEA study in 2017 (ASEA, 2018) to analyse market trends. As can be seen by the bars (right axis) in Figure 6, the seven SME stock exchanges did not experience any significant growth over the two years as the CAGR amounts to 2 per cent and listings change only slightly from 150 to 156. In fact, in Botswana and Nigeria the company firm listings even went down by 1, Zambia remained at 0 listings and the other countries only increased the number of listings by 1 firm – except for Mauritius with an increase of 5 listings. But even top performer Mauritius only grew by a CAGR of 5.5 per cent over the timespan. This strongly highlights the overall stagnation in SME stock markets in Africa.

## **5 Discussion: the role of mobile money, crowdfunding & equity in SME finance**

Mobile money in Africa is the showcase of how digital innovation changes the way the financing industry operates: Mobile money accounts have surpassed the penetration of conventional bank accounts, and mobile money loans in Kenya, as one of the frontrunner countries, have risen beyond the number of conventional loans. Hence, this instrument seems to live up to the narrative and hype around digitalisation. Having said this, innovative incumbents (i.e. MNOs and banks operating in partnership) dominate the mobile money market. Hence, established players use digital advances to defend and enhance their position in the market instead of new FinTechs taking over, which runs counter to the classical narrative around digitalisation and FinTechs.

Moreover, the number of mobile money loans in Kenya might be high, but the size of the loan portfolio (USD 150.6 million) falls far behind outstanding SME loans by the banking sector, which amount to more than USD 3 billion. One takeaway is that digital credit often comes in small loan sizes, suggesting that this instrument is mainly used by private households to meet consumption needs. To a smaller extent, micro and small enterprises may make use of digital loans to finance working capital needs as CBK M-Pesa offers suitable loan sizes and repayment periods for such purposes. Yet this cannot provide the foundation for productive investments of a medium- and long-term nature that allow SMEs to improve productivity, innovate and advance beyond local operations.

Despite its limited use for productive SME finance, mobile money services play an important role in facilitating the emergence of other financial services and access to other financing tools. Take the micro and small enterprises, for instance, that take out small digital credits. They build up a credit history and thus improve issues of opaqueness and creditworthiness, which enhances their chances of accessing more valuable external financing options. At the same time, mobile money is a stepping stone for providers of other alternative financing instruments. Crowdfunding, for example, is more accessible and user-friendly since contributions can be made without owning a bank account via transfers from the mobile phone. The level of advancement in the mobile money industry is further underlined by the harmonisation between different service providers for increased interoperability and the integration into worldwide payment systems through cooperation with service providers of international transfers.

But at the same time mobile money threatens to widen the gap to the small group of the disadvantaged who do not have access to a mobile phone, network or the necessary digital and financial literacy. It is important that governments stay committed to the 2030 Agenda, to leave no one behind; and if necessary find the right means such that private sector firms close the remaining gaps in network coverage and do their part in raising financial and digital literacy among citizens.

First signs of a rise in non-performing loans also point at the risk for the integrity and stability of digital credit markets if financial service providers are not sufficiently regulated. Customers with little to no financial literacy need to be protected against exploitative practices. Obligations to educate customers about the functioning of the financial service, its cost structures and potential risks are necessary to prevent exploitative business models. Prudent regulations need to inhibit trends of financialisation of the poor to avoid a repetition

of over-indebtedness, social misery and crises similar to developments in the microfinance industry just a decade ago.

Crowdfunding is an instrument that is still new to African societies and thus the market is still very small (USD 127 million) when compared to the USD 300 billion being raised elsewhere. But the accelerating increases between 2013 and 2016 point at an early stage exponential growth trajectory such that the World Bank projection of USD 2.5 billion by 2025 could be plausible. However, many challenges and crossroads are ahead and the outcome and final ceiling cannot be predicted for such a young and nascent market.

As observed in the Chinese crowdfunding market in the past years, unfavourable changes in regulation can derail promising growth trajectories and plummet the levels of raised funds. Hence, one of the central determinants of the development in the nearer future is the response of regulators to the growing industry. Voices from African platform providers already called for a legal framework that lifts providers out of the grey areas, creates certainty for the business and protects the rights of investors, project initiators and platform providers. Such regulations especially foster the emergence and growth of national crowdfunding platforms that disproportionately serve as fundraisers for business- and entrepreneurship-related projects. But crowdfunding platforms also provide value beyond the raised capital by bringing a crowd behind the project: firms can increase awareness and visibility which helps with the launch or sale of the product, but also with building networks and contacts for future benefits.

It remains to be seen whether future legislation fosters the current growth and whether it can additionally alter the high dependence on international platforms to raise funds for African projects. However, the share of raised funds that are used for productive MSME projects is much larger than in the case of mobile money so that this instrument seems to be more directly applicable to the demands of SME financing. Hence, it could become a useful instrument that complements the range of already existing SME finance tools.

As seen in the discussion of mobile money, regulation is a sensitive issue that needs to be addressed in order to ensure stability and integrity of the financial system; but at the same time, it needs to be applied prudently in order to not destroy young, emerging markets, as seen in the discussion of crowdfunding. Authorities should not impose the full existing financial regulatory framework on the new digital financial intermediaries: banks' capital and liquidity requirements, for example, would add to the operational cost burden for new players. In proportion to their respective financial intermediation activities, FinTech companies should face differentiated requirements that balance the risks of the digital finance industry with its efficiency gains for the financial system. One promising approach are so-called 'regulatory sandboxes' where new regulations are tested in a closed setting in order to learn about the risks while allowing for innovation. Examples for such regulatory sandboxes are Mauritius in 2016 or Mexico in 2017 – a brief overview thereof is provided in the annex of Maino et al. (2019).

In comparison to the first two instruments, SME stock exchanges provided by far the most capital to SMEs. The market capitalisation of USD 3.2 billion far outweighs the current funds raised by digital credit or crowdfunding. However, there are several peculiarities that limit the developmental impact of this instrument. First, almost the entire market capitalisation stems from three countries: Mauritius, South Africa and Botswana. All of



them are relatively rich and developed, indicating that a functioning stock market needs a certain economic environment that can guarantee a steady pipeline of suitable SMEs. This is not only hard to achieve in the first place, but also takes years and possibly decades. Second, SMEs need to meet certain criteria to qualify for listing at an exchange market. Consequently, this is a financing instrument that only suits a very small fraction of the SME universe such that it cannot serve as remedy for the financing constraints of a large majority of SMEs. However, as risk financing options are extremely scarce and especially important for young innovative firms with strong growth potential, equity unlocks the potential of the SMEs that contribute most to employment creation and growth. Furthermore, it also improves the private capital and venture capital market as it provides exit options for early investors, increasing the attractiveness of getting involved. As such, it is desirable to have such an instrument at your disposal.

However, the African SME exchange markets have been stagnant over the period from 2015 to 2017, and did not show signs of moving in a certain direction. This does not look promising compared to the dynamism exhibited by the other two instruments. It will require a new impulse to lead the SME exchange markets into a more agile future. This cannot come from the stock exchange alone, but also necessitates support through government programmes such as strengthening the macroeconomic stability, building capacity to make SMEs ready for listing and providing tax incentives for firms to diversify their capital structure towards equity. Yet there might be easier, lower-hanging fruits for most African governments to pick before tackling SME exchange markets.

## **6 Conclusions**

Digital advances such as mobile money may exhibit dynamic growth trajectories and, because of the great advantages – above all, in terms of operational costs as well as convenience and simplicity for users – reach more customers than the corresponding conventional financial services. This then gives rise to the narrative of a remake of the financial system. Yet, such interpretations do not hold up under closer inspection, since developments vary significantly across Africa with digital frontrunner countries exhibiting considerably changing markets while in other countries the financial system remains mostly unaffected by digital innovations. Moreover, even the market changes generally do not imply that new digital financial services take over the markets from more conventional instruments and incumbents, but rather that they create new markets or new niches within the same markets. A good example is digital credit where the number of issued loans has surpassed those of conventional loans, but loan volumes and usage of the loans differ significantly such that digitalisation has added new facets to the market, but did not replace the dominant position of banks in SME finance. In Kenya, for instance, the outstanding SME loan portfolio is still about twenty times that of digital credit.

Other new digital instruments such as crowdfunding have more recently taken hold on the African continent and are just at the very beginning of an exponential expansion: so far, they still make very negligible contributions to the financing of SMEs. But crowdfunding may grow to become a substantial source of SME finance in the not too distant future, if a suitable legal framework is developed to fill the legal vacuum. In addition, there are other uncertainties that do not permit making reliable forecasts about the market development.

Still, crowdfunding is a good example of how digitalisation allows for the emergence of new financing instruments that complement the range of established SME financing tools and greatly enhance inclusiveness of the financial system by also providing access to formerly unreached or underserved SMEs.

Overall, there is a lot of uncertainty about the impact of financial technology for the financial system. It can only be said that it is less disruptive than expected and rather gradually changes the industry – if it has influential impact on the respective financial system in the respective country at all. But especially with respect to mobile money, the African market has experienced a rate of adoption by customers that is not matched by counterparts in high-income countries. This poses great challenges to regulators who are generally a few steps behind the innovative dynamism of such evolving markets. They need to strike a balance between leaving space for innovations and mitigating risks for the integrity and stability of the market and if necessary for the wider financial system.<sup>16</sup> Regulators may want to consider obligatory reporting requirements, as this raises incentives for on-time repayment, curbs over-indebtedness and fraud and thus contributes to the efficiency as well as integrity and stability of the overall system.

Regulators also need to further address the delicate issues of ensuring data privacy and cybersecurity, especially since new digital algorithms are fed by automated collections of financial data such as mobile transactions, savings and repayment histories in combination with alternative data from social media, online market places, phone data on calls, locations and so on as well as from other sources. All of this taken together creates a very sensitive data package allowing for levels of profiling that may attract the interest of hackers. Especially smaller innovative providers of digital finance are strained by the fixed costs of installing and updating cybersecurity systems, which results in underinvestment and the risk of data breaches. Beyond the security aspect, regulators may want to also address data privacy, because it helps to stem bad practices such as hidden and obscure opt-out features so that customers effectively cannot prevent excessive collection of sensible private data. New digital financial services also create novel challenges for governments with regard to money laundering, financing of terrorism and other illicit financial flows.

In general, responsible authorities have to get ahead of the game and instead of reacting to evolving technological trends in the financial markets, set the direction of where the digital financial innovations are heading by providing guide rails via prudent legislative frameworks. After all, government and regulators have to assess in which cases digital developments also serve the public interest of fostering inclusive and sustainable development and in which cases business interests merely create schemes to collect data and profits from vulnerable groups of people by exploiting their limited financial literacy. The low threshold of digital solutions greatly enhances the outreach of digital financial instruments, which makes such scenarios about financialisation of the poor more likely. Regulators need to step in and learn and prevent a reoccurrence of the shortcomings of microfinance where similar issues came into play and led to grievous social and economic crises.

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16 So far, digital credits constitute such a small proportion of volume of lending that even in mature mobile money markets, digital credits cannot result in serious risks for the wider financial system. All the same, suitable legal frameworks are required in this evolving market to guarantee healthy and sustainable market development and to prevent future risks for the financial system.

Even though digital advances in the financial system come with demanding challenges for governments and regulators, they provide great potential for the inclusiveness and availability of financial services in general and SME finance in particular. It is worth investing into the necessary physical infrastructure and the capabilities of citizens to ensure that no one is left behind. In the end, however, digitalisation in the financial system is not an end in itself, but a means to foster inclusive and sustainable economic development. And governments have to set the guiding legal framework bearing this in mind.

## 7 Policy Considerations

Based on the preceding discussions and conclusions, policymakers are encouraged to proactively guide the development of the digital finance industry through a prudent legal framework such that it advances the inclusive and sustainable economic development of their respective countries. Hence, most of these policy considerations address regulatory issues and only two are concerned with investments.

The government needs to invest in the capabilities of its citizens and to ensure that necessary **investments** in physical infrastructure are undertaken so that no one is left behind by the digitalising financial system. Digitalisation promises great advances for financial inclusion both for unserved and underserved firms, in particular MSMEs, as well as households. However, basic financial and digital literacy along with basic infrastructure for mobile networks and/or internet connections are required to tap these digital dividends. Governments need to make sure that certain groups such as people in rural areas, women, the elderly and others are not excluded from access to digital financial services:

- This includes that the citizens have *sufficient levels financial and digital literacy*. Bilateral and multilateral donors can support the respective governments with financial and technical cooperation in their task of equipping citizens with the necessary capabilities. Empowerment naturally occurs in educational environments and school programmes should adopt such topics. But public institutions can additionally enhance financial and digital literacy by providing applicable information packages and training modules. This is to some degree also in their own interest when applied to, for instance, digitalising tax payments, salary payments of government employees, and utility payments (if in public hands). After all, this saves costs, increases efficiency and advances the citizens' understanding, usage and appreciation of digital financial services if implemented accordingly.
- Furthermore, *physical infrastructure investments* are required. Here, it is not necessarily the government that has to cover the bill. Development finance institutions and donor countries can step in to help fund physical infrastructure projects. Yet the private sector has to be pushed such that decisions on network coverage are not based on cost-benefit analyses, but guided by the objective of complete coverage and inclusion. Otherwise, profit-driven network providers tend to underinvest in mobile networks and internet connections in rural areas, which results in widening economic and social disparities with subsequent problems.

With the **legal framework**, authorities have to strike a balance between the stability and integrity of new digital finance markets as well as the wider financial system and the room

for innovation and growth. One good practice is the establishment of “regulatory sandboxes” where legislation is tested in a closed setting and regulators can learn about risks without hindering innovation. While it is advisable to not impose the full set of banking regulations on the new financial intermediaries, it is more difficult to spell out what differentiated requirements for new financial players in line with their respective intermediation activities should look like. And additional questions about the (non-)differentiation between the conventional banking sector and new players arise: For instance, would certain safety mechanism of the financial system, such as lender of last resort facilities, implicit guarantees and deposit insurance schemes, also apply to (parts of) the FinTech industry? This is a question to be addressed in future research. In any case, authorities should consider the following points:

- Regulators need to *protect the data privacy* of users. This involves on the one hand transparency about what data is being used and how it is processed by digital service providers. On the other hand, it guarantees that data is only used for the demanded service and not shared within or even outside the firm. Legislation should further prevent excessive data collection without the active knowledge and consent of customers, in other words forbid opt-out approaches to data collection.
- Authorities need to introduce *binding minimum requirements for cybersecurity*. Since digital financial institutions deal with highly sensitive information, even smaller FinTech companies should be obliged to sufficiently invest in cybersecurity systems. To overcome the fixed-cost burdens, smaller digital finance providers or certain sub-industries could jointly invest in the development of suitable systems and the government could act as a broker in this collective action problem.
- National and international regulators need to *prevent illicit financial flows*. Even though the financing industry is quite aware of and experienced in dealing with the issues of money laundering, financing of terrorism and other illegal financial interactions, new financial instruments always create novel opportunities for criminal networks that need to be shut down immediately.
- The legal framework should also comprise *reporting requirements*. In many countries, non-bank actors are not required to report to credit reporting agencies and providers. Yet, reporting enhances the efficiency and stability of the financial system as it raises incentives for on-time repayments and curbs over-indebtedness and fraud.
- Certain new digital financial instruments such as *crowdfunding need a legal framework*. It is important to provide legal protection and certainty for all parties involved and to foster the emergence of national digital service providers with localised solutions. International providers are often blind to national conditions that require customised services such as mobile money or offline solutions, and are often more focused on social projects than the financing of entrepreneurship and SMEs.
- Lastly, governments need to *protect vulnerable people from exploitative financialisation*. The experience from microfinance has shown that greater financial access for the underserved and unserved may lead to exploitation and financialisation of the poor. Limited financial literacy and hidden cost structures are at the core of the problem. Hence, regulators need to ensure that customers are sufficiently educated about the nature and functioning of the financial instrument and about its associated costs and risks.

Since other countries and regions have faced similar regulatory challenges, technical cooperation and information exchange could inform the drafting of national legal frameworks for digital finance in Sub-Saharan Africa. International regulators and international standard-setting bodies, relevant international forums and platforms as well as bilateral cooperation should foster the knowledge exchange and the spread of best practices on the one hand and improve coordination and harmonisation of digital finance regulations on the other hand.

Only if these requirements are fulfilled, can digital advances in finance foster inclusive and sustainable economic development. It is paramount that vulnerable groups, disadvantaged entrepreneurs and smaller firms also benefit from digital financial services so that the digitalisation of the financial system may foster pro-poor growth, does no harm to social cohesion and potentially even contributes to societal cohesiveness. Further research is required to better understand these interconnections and to establish a link between digital financial markets and social cohesion.

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## Appendix

### Mobile money examples

The two market leaders in Africa, M-Pesa and MTN Mobile Money, are good examples for the first type of partnership in mobile money that is dominated by MNOs. M-Pesa is a mobile money platform launched in 2007 by the MNO Safaricom. Kenya-based M-Pesa operates in 19 countries in East and West Africa. According to the company, it currently serves 28.5 million users of mobile money. South Africa-based MTN launched its mobile money service in 2009. MTN reports that it currently operates in 23 countries in the Middle East and Africa accounting for 22.2 million users. Further examples are the mobile financial services of MNO Tigo which operates in 11 countries in Latin America and Africa, as well as Orange Money, a service of MNO Orange S.A. which operates in 16 African countries.

Examples for the second partnership type (still MNO-led but more strongly influenced by banks) are two providers of digital credit based on cell phone data: M-Shwari and KCB M-Pesa. Target groups and lending conditions differ, but they mainly serve private consumers and also MSMEs. Both providers are partnerships between Kenyan mobile money provider M-Pesa and a banking institution. On the one hand, M-Pesa partnered with Commercial Bank of Africa (CBA) in the launch of M-Shwari in 2014, which provides customers with easy access to loans of up to USD 1,200. KCB M-Pesa, on the other hand, is a partnership of M-Pesa and the Kenya Commercial Bank (KCB) launched in 2015. Both products work in a similar way. However, as the International Finance Corporation (2017) points out, the latter is more adapted to the MSME target group with longer repayment periods and credit volumes of up to USD 10,000.

Kenya-based Equitel constitutes an example of the third type, namely the bank-led partnership. It is a cooperation between the Equity Bank and MNO Airtel with over two million customers in Kenya. The partnership provides basic mobile money services like the transfer of money, but also more advanced options such as loan disposal and deposit services for Kenyan users.

### Crowdfunding examples

The most successful foreign crowdfunding platform in terms of funds raised for African projects in 2015 was US-based Kiva. According to Afrikstart (2016), Kiva accounted for USD 35.9 million out of a total USD 94.6 million raised in 2015 for African projects. Kiva is a combination of lending-, rewards- and equity-based platform that was launched in 2005 and is active worldwide. Donation-based platforms Betterplace (USD 9.9 million raised for African projects) and GoFundMe (USD 9.1 million raised for African projects) followed as the leading foreign platforms in 2015. Both platforms, German-based Betterplace and US-based GoFundMe, offer the opportunity to raise donations and thus are more targeted at private and charitable projects than supporting business initiatives. However, a limitation of international platforms for African projects is that some non-African-based platforms

require citizenship in countries of the global North. Examples for this are Betterplace and GoFundMe.

According to Afrikstart (2016), South African RainFin was the leading African-based crowdfunding platform in 2015 with regard to raised funds. From a total amount of USD 32.3 million of African platforms, RainFin attracted USD 17.5 million in that year. The platform specifically targets SMEs and corporates to raise business loans and provide profits for the backers. However, RainFin is also an example of an African-based platform that took advantage of a partnership with an international financial institution. Barclays Bank acquired a 49-per cent stake of the platform and provided support in the early stages, which enhanced the trustworthiness of the platform to customers.

A special type of crowdfunding is presented as another example here in Box A1:

**Box A1: Diaspora financing and crowdfunding platforms**

In general, a diaspora is defined as migrated ethnic groups or their descendants who stay emotionally and materially connected to their country/region of origin (Sheffer, 1986). The diaspora of a given country of origin cannot be easily identified so that any estimation connected to diaspora runs into difficulties. Factors to estimate a country's diaspora are the place of birth, citizenship, time of migration and perceived identity (Ionescu, 2006). As of 2012, the World Bank reports that the African diaspora is estimated to amount to about 169 million people worldwide.

Diaspora investment does not only encompass financing such as diaspora bonds and remittances, but also includes, for instance, transfer of social capital, technology and business partnerships. In 2015, the SSA diaspora contributed to the development of the region by sending about USD 35.2 billion in remittances to their connected countries. In the same year, remittances to the Middle East and North Africa amounted to USD 50.3 billion (World Bank, 2016).

At the interface of diaspora financing and crowdfunding, some platforms emerged that target the diaspora and enable them to reinvest into their country of origin. These platforms provide the diaspora with an infrastructure to easily find and fund enterprises and projects in their respective countries. They can mitigate intransparencies which might cause the diaspora to be reluctant to invest and thereby create opportunities to increase the number of funded MSME projects (AlliedCrowds, 2015). FSD Africa and AlliedCrowds (2016) further argue that diaspora financing channelled through crowdfunding can provide for the financial needs for projects which are rated as too risky by foreign investors. In addition, the authors point out that diaspora crowdfunding can cut transaction costs by offering lower average fees on the raised money than remittances transfer services would charge.

Examples of diaspora crowdfunding platforms for African countries are Homestrings and the Lelapa Fund. Platforms do not always target projects directly. Homestrings, for example, offers the diaspora of several developing countries the opportunity to invest in funds, bonds or projects in their connected country of origin. The selected investment opportunities promote infrastructure, health care, education, real estate, telecoms, transportation or SMEs. The equity-based crowdfunding platform Lelapa Fund explicitly targets the African market and there specifically investments in fast-moving consumer goods as well as tech enterprises.

## Equity examples

	<b>Country</b>	<b>Stock exchange</b>	<b>SME board</b>	<b>Year of launch of the SME board</b>	<b>Market capitalisation</b> (USD million, as of end 2015)	<b>Number of listed companies</b> (as of end 2015)	<b>Number of listed companies</b> (as of end 2017)
<b>Exchange markets that include a dedicated SME board</b>	Botswana	Botswana Stock Exchange (est. 1989)	Venture Capital Board	2001	747	8	7
	Cameroon	Douala Stock Exchange (est. 2001)	Douala Stock Exchange	(unknown to us)	n/a	n/a	0
	Egypt	The Egyptian Exchange (est. 1883)	Nile Stock Exchange (NILEX)	2007	131	31	32
	Ghana	Ghana Stock Exchange Market (est. 1990)	Ghana Alternative Market (GAX)	2013	n/a	4	n/a
	Kenya	Nairobi Securities Exchange (est. 1954)	Growth Enterprise Market Segment (GEMS)	2013	n/a	4	5
	Libya	Libyan Stock Market (est. 2007)	Libyan Sub-Market	(unknown to us)	n/a	n/a	n/a
	Malawi	Malawi Stock Exchange (est. 1995)	Alternative Capital Market	2007	0	0	n/a
	Mauritius	Stock Exchange of Mauritius (est. 1988)	Development & Enterprise Market (MDEM)	2006	1,377	44	49
	Morocco	Casablanca Stock Exchange (est. 1929)	Growth Market	2000	n/a	n/a	12
	Mozambique	Mozambique Stock Exchange (est. 1999)	SENCOD Market	2009	n/a	n/a	1
	Nigeria	Nigerian Stock Exchange (est. 1960)	Alternative Securities Market (ASeM)	2013	43	11	10
	Rwanda	Rwanda Stock Exchange (est. 2008)	SME Market Segment	2013	0	0	n/a
	Seychelles	Trop-X Ltd (est. 2012)	SME Board	2012	n/a	n/a	1
	South Africa	Johannesburg Stock Exchange (est. 1887)	Alternative Exchange (AltX)	2003	905	52	53
	Sudan	Khartoum Stock Exchange (est. 1994)	Alternative Board (AB)	(unknown to us)	n/a	n/a	0
	Swaziland	Swaziland Stock Exchange (est. 1990)	SME Board	(unknown to us)	n/a	n/a	0
	Tanzania	Dar es Salaam Stock Exchange (est. 1998)	Enterprise Growth Market (EGM)	2013	n/a	4	n/a
	Tunisia	Bourse de Tunis (est. 1969)	Tunis Stock Exchange Alternative Market	2007	7	12	n/a
Uganda	Uganda Securities Exchange (est.1997), ALTX East Africa Exchange (est. 2013)	Growth Enterprise Market Segment (GEMS)	2012	0	0	n/a	
Zambia	Lusaka Stock Exchange (est.1994),Agricultural Commodities Exchange of Zambia (est. 2007)	Alternative Market	2015	0	0	0	



**Table A1 (cont.): SME boards, listings and capitalisation for African countries with stock exchanges**

Exchange markets without dedicated SME boards	Algeria	Algiers Stock Exchange (est. 1997)					
	Angola	Angolan Debt and Stock Exchange (Bodiva) (est. 2016)					
	Cape Verde	Bolsa de Valores de Cabo Verde (est. 2005)					
	Côte d'Ivoire	Bourse Régionale des Valeurs Mobilières (est. 1998)					
	Lesotho	Maseru Securities Exchange (est.2016)					
	Namibia	Namibia Stock Exchange (est. 1992)					
	Somalia	Somali Stock Exchange (est. 2015)					
	Zimbabwe	Zimbabwe Stock Exchange (est. 1948)	According to ASEA (2018): Not so far; as of Dec 17: plans to introduce a SME board				

Source: Own visualisation based on data from ASEA (2018) and Schellhase and Woodsome (2017)

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