

E-Money and Deposit Insurance in Kenya

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E-MONEY AND DEPOSIT INSURANCE IN KENYA

Executive Summary

E-money is widespread in Kenya, especially through MPESA, a form of e-money stored on mobile phones and issued by Safaricom, a mobile network operator (MNO). Integration between the MPESA platform and the traditional banking system is increasing. Given the very high use-grade of MPESA throughout the population, it has reached critical importance in Kenya.

In Kenya, e-money issuers must back their e-value with bank balances at commercial banks (float), through trust accounts. Deposit insurance does not cover a default of the e-money issuer. However, the Kenya Deposit Insurance Corporation aims at offering pass-through coverage in case of a default of the deposit-taking commercial bank holding the trust accounts.

Pass-through coverage is confronted with a number of challenges, including regarding data on the identity of e-money users and their balances held. Also, the critical importance of MPESA raises questions as to how to deal with a potential default of the MNO and the role of deposit insurance in such a scenario. Looking forward, there is merit in further coordination amongst safety net participants as well as in the management of trust accounts and the strengthening of data-availability requirements to e-money issuers.

1 Introduction

E-money has increasingly become a more relevant component of the Kenyan financial services industry. Extensive uptake of e-money options amongst a population previously regarded as under-banked, has made Kenya an interesting case study from the perspective of deposit insurers, and policy makers more generally. Kenya has become a global leader in working with e-money issuers to increase overall access to digital financial services and assisted in integrating these services within the financial safety net. This paper offers a summary of the Kenyan experience and highlights considerations for the deposit insurance framework.

The characterisation of e-money continues to evolve as new products and services become available in the market. IADI defines e-money as "... an electronic store of monetary value on a technical device that may be widely used for making payments to entities other than the e-money issuer. The device acts as a prepaid bearer instrument that does not necessarily involve bank accounts in transactions." E-money, through the broader prism of fintech advances, has been identified by IADI as one of five emerging issues for deposit insurers to prioritise over the coming period.²

A 2019 survey jointly facilitated by the Alliance for Financial Inclusion (AFI) and IADI yielded the following definition of e-money in Kenya, as defined by the Kenya Deposit Insurance Corporation (KDIC): "E-money means monetary value as represented by a claim on its issuer, that is: (i) Electronically, including magnetically, stored; (ii) Issued against receipt of currency of Kenya; and (iii) Accepted as a means of payment by persons other than the issuer."

1.1 The Kenyan financial system

Kenya's financial sector comprises a variety of institutions offering a range of financial products and services. They can be broadly grouped into: deposit-taking institutions (commercial banks, mortgage finance companies, microfinance banks and Savings and Credit Co-operatives (Saccos)); non-deposit taking institutions (insurance industry, pensions industry, capital markets industry, and Development Finance Institutions); and financial markets infrastructure providers.

² Van Roosebeke & Defina (2021)

¹ IADI Glossary.

³AFI & IADI (2020)

The national treasury is responsible for the development of financial sector policy and regulations in consultation with the respective sector regulators. The sector is regulated and supervised by: the Capital Markets Authority (CMA); the Central Bank of Kenya (CBK); the Insurance Regulatory Authority (IRA); the Retirement Benefits Authority (RBA); and the Sacco Societies Regulatory Authority (SASRA).

1.2 The e-money service industry

The largest e-money issuer is Safaricom Kenya Limited through their service dubbed MPESA. As of July 2019, 90% of Kenyans over the age of fourteen were conducting transactions through MPESA.⁴ MPESA's share of mobile money subscriptions was 98.8% in the first quarter of 2020.⁵ The closest competitors, Airtel Money and T-Kash, recorded market shares of only 1.1% and 0.05% respectively.⁶

MPESA started its business in 2007 as a mobile phone-based money transfer service owned by Safaricom (a subsidiary of Vodafone), Kenya's largest mobile network operator. Within its first three years, MPESA attracted over 9.5 million customers. To offer some sense of scale, Kenya only had 8.4 million active bank accounts within the domestic system at this time. In these earlier years, more than USD 320 million in person-to-person transfers occurred every month. A total of 12 billion transactions were conducted in 2019. As of December 2020, MPESA had 41.5 million customers across the Democratic Republic of Congo, Egypt, Ghana, Kenya, Lesotho, Mozambique and Tanzania.

Credit and debit cards are not well developed in Kenya, with only a minority of commercial outlets accepting these as a means of payment (including prominent vendors such as VISA and MasterCard). However, most will accept MPESA for payment of goods and services. Due to its wide acceptance, banks have often linked their customer accounts with MPESA, through a pre-funding arrangement which facilitates increased interoperability and simplifies the means by which exchanges (between Kenyan Shilling (KES) in commercial bank accounts and credits in MPESA accounts) can occur.⁹

Another major reason for the increase in e-money service provision is the expansion of mobile connections, which has risen dramatically since the inception of MPESA – Kenya had 52 million connections in place as of January 2020, an 8.7% increase over the preceding year, continuing a well-documented trend. Safaricom accounts for approximately 65% of these connections, followed by Airtel Networks at 25%.

1.2.1 E-money operating model

E-money issuers have thousands of agents scattered throughout Kenya. Agents (often small retailers) provide cash to an e-money issuer (often a mobile network operator, MNO) in exchange for e-money. The agents' cash is deposited in MPESA trust accounts and agents are provided with e-money units. Customers across the country can contact these agents to exchange cash for an equivalent amount of e-money units that are instantly credited to their e-money accounts which are linked to their phone number. In practice, agents will give e-money units they already hold to customers in exchange for their cash. This is referred to as "Depositing". Conversely, customers can give e-money units to agents and receive cash held by the latter. This is referred to as "Withdrawing". The agents can exchange their e-money units with the Electronic Money Issuer (EMI) and get back their cash.

The agents earn a commission on each deposit or withdrawal transaction that they close which serves as their compensation by the MNO. Through their pricing policy, EMIs give customers incentives to retain funds as e-money units: the exchange of cash into e-money is free of charge (though the MNO pays the agent a commission) and e-money transactions are subject to very low charges (sometime at zero costs); while exchanging e-money into cash comes at significant charge. Thus, users who have already acquired e-money units are incentivised to transact within that sphere, creating more e-money transactions.

⁵ CAK (2020) for the quarter ended March 31, 2020. Youssef et al (2021) define mobile money as "a type of e-money that is offered specifically by mobile network operators".

⁸ According to the CBK, the total value of transactions occurring in January 2021 totalled 60 billion Kenyan shillings i.e. approximately USD 600 million.

⁴ Anyanzwa (2019)

⁶ See Gilbert (2020) for further commentary.

⁷ Tarazi & Breloff (2010)

⁹ This development demonstrates that a selection of commercial banks and e-money issuers (EMIs) are looking to build mutually beneficial partnerships.

The ability for the agent to meet his customer needs (cash needs or e-money needs) is largely determined by the agent's operating capital which is dependent upon demand as anticipated by the agent. Agents with high cash demand will tend to hold more cash while those with high e-money demand will tend to hold more e-money units. To provide liquidity to these agents, MNOs have partnered with commercial banks. Through this arrangement, agents buy e-money from commercial banks which are 'super agents' for the MNOs. The agents will equally deposit their excess cash with these banks for security reasons.

Commercial banks have increasingly entered into partnerships with MNOs. They have integrated their systems such that bank customers who have registered their mobile phone number with the bank have easier access to e-money. They can exchange cash into e-money (and vice versa) through the mobile phone. With this innovation, the relevance of retail agents is decreasing.

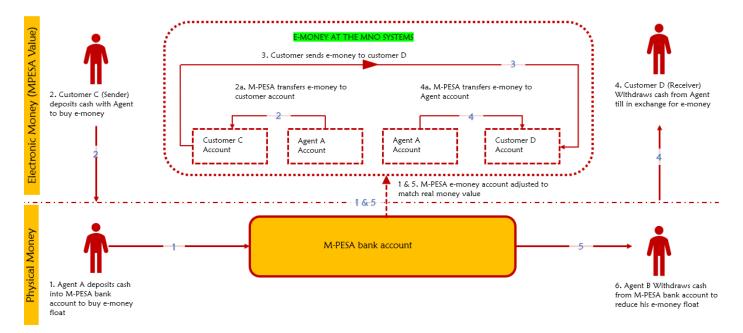


Figure 1: The M-PESA operating model

Vice versa, access to banking services through e-money is also made easier through integration of services. *M-Shwari* is a bank saving account and e-money product. The product offers an integration between the MPESA platform and the bank's core banking system, enabling MNO customers to access the banking services through their mobile phones and open a bank account in a bank that is mapped to their mobile phone. The customers are then allowed to save and borrow from the bank like any other bank customer. The product was tailored to micro-enterprises allowing them to save and earn interest as well as borrow on a very short-term basis – normally one month or less. The product interest rates are quite high and range between 5%-10% per month. In a real situation, customers borrow in the morning to buy products such as groceries in the wholesale market and sell them in the retail market. Through their margin, they repay the loan before the end of the day. MPESA customers can open a bank deposit and loan account with a commercial bank and move funds between the e-money and this bank deposit account that earns interest. The commercial bank uses personal information available with Safaricom to identify customers and comply with "know your customer" requirements. This product was pioneered in NCBA Bank Kenya Plc but it has since been offered by other commercial banks under different product names.

Many utility companies have also employed MPESA for collections, with a majority no longer accepting cash as a mode of payment for services. This has drastically reduced their cash handling costs and risks.

Given the high number of users, the importance of the MPESA platform to the Kenyan economy has been rising. A bill is currently in the Kenyan parliament (The Kenya Information and Communication (Amendment) Bill, 2017) seeking to separate the service from Safaricom. Proponents of the bill argue that such a separation would allow the central bank to supervise MPESA as though it were a traditional bank. At the time of writing, the bill had not been passed.

1.2.2 Fraud within the context of e-money

The uptake in e-money issuing has introduced new risks to the financial sector. Some are inherently connected to the e-money model, while others are known risks that apply uniquely within the context of e-money. A 2012 study flagged a suite of potential fraud risks that are present with e-money solutions. ¹⁰ These are grouped into transaction, channel and internal risks.

Table 1 – Potential Sources of Fraud with E-money Solutions

Transactional risk	Channel risk	Internal risk
Vishing/Smishing. Use of phone calls or SMS to gather personal details such as account numbers, PINs or personal identification details.	multiple commissions (only applied	Internal fraud. Employees colluding for unfair personal financial gain.
Advance fee scams. Customers duped to send funds under fake circumstances or promises.	False transactions. Agents transferring customer funds to personal account.	<i>Identity theft.</i> Employees accessing and exploiting customer information without authorisation.
Payroll fraud. Non-existent "ghost" employees receiving funds.	Registration fraud. Creation of accounts for false, invalid or duplicated customers for the purpose of obtaining extra registration commissions.	
Reversal requests. Customer requests to reverse transactions that were in fact successful.	Commissions	
False transactions. Sending fake SMS to make customers believe a transaction was successful. Often accompanied by a reversal request.		

The extent to which EMIs have sought to mitigate such risks varies. Safaricom/MPESA has sought to raise customer awareness through a multi-pronged communication approach. These include SMS blasts, radio announcements in local dialects, local skits and newspaper ads. Internal measures implemented by MPESA to safeguard depositor information and account balances are not well known. The service provider publicly states that "Each transaction made with MPESA is electronic and can therefore be monitored by Vodafone, which runs its own bank-grade anti-money laundering system."

The Kenya Deposit Insurance Corporation has confirmed that the following fraudulent activities have occurred within their jurisdiction: SIM card swapping resulting in unauthorised access of one's e-money account; cybercrime attacks where traditional bank accounts are accessed via e-money and transferred to MPESA accounts.

¹⁰ Gilman & Joyce (2012)

2 The regulatory and deposit insurance framework for e-money

2.1 Policy Aims

A number of issues were core to policy discussions concerning the regulation of EMIs and manner in which they were included in the deposit insurance framework. These include:

Managing the money supply. The CBK is the only institution with authority to print/create money in the Kenyan economy. Creation of private money by EMIs was viewed as potentially yielding adverse consequences for the financial system. This includes implications through exchange rate and inflation channels.

Encouraging innovation. Authorities sought to provide accommodating conditions to encourage private sector innovation in the payments sector. Hence the central bank allowed the initiative and sought to develop appropriate regulations to address financial stability considerations.

Financial stability and financial inclusion. There has been substantial growth in the use of e-money within Kenya. ¹¹ Policy makers viewed this broad uptake (for the facilitation of saving and payments) as presenting a risk to both financial stability and financial inclusiveness should an EMI failure occur. As such, a regulatory approach was preferred to impose safeguards for depositors and a policy was designed to not exclude EMIs entirely from the traditional banking framework.

2.2 Regulation of EMIs

The CBK has published a detailed regulation for e-money with a focus on appropriately integrating EMIs into the financial safety net. The Central Bank stated: "The purpose of this Regulation is to provide for: (a) the authorisation of e-money issuers and the conduct of the business of e-money issuing; (b) the appointment of agents by e-money issuers and the registration of such agents; and (c) appropriate measures to protect the interests of the clients of e-money issuers." ¹²

EMIs in Kenya are regulated by the CBK through the National Payment System Act (2011). These issuers are required to apply for a license with the CBK before operating. EMIs must back their e-value on a one-to-one basis. For all e-currency in circulation, an equivalent amount must be held as ring-fenced trust account in the form of bank balances within commercial banks or in Government of Kenya securities. The CBK may request EMIs – and has done so – to keep its liquid assets in more than one bank and limit exposure to a single bank. ¹⁴

2.3 Deposit Insurance for E-money

The deposit insurance framework in Kenya covers deposits per depositor equal to 500,000 Kenyan Shilling (KES), which corresponds to approximately USD 5,000 (100 KES = 1 USD). The 2021 IADI Annual Survey¹⁵ indicates that the Kenya Deposit Insurance Corporation (KDIC) offers coverage to 40 commercial banks and 14 microfinance institutions. The products covered by the deposit insurance framework include saving accounts, checking, certificates of deposit, and foreign currency deposits.

2.3.1 EMI Default

E-money is not directly covered by Kenyan deposit insurance legislation. Thus, default of the EMI itself does not trigger protection by the KDIC. Upon such EMI failure (which is yet to occur), the segregated float accounts would enter into the insolvency mass. Also, although the KDIC does have a broad suite of resolution powers and tools available, the Mobile Network Operator (MNO) as EMI is not within the KDIC's mandate. It remains unclear which resolution tools could and would be applied and if so, by which other institution, to a failing EMI and to which degree customer funds might be recovered outside of bankruptcy and insolvency laws.

¹³ CBK (2013), Section 8.1 and CBK (2014), Art. 25 (3)

¹¹ See 1.3 E-money service industry for further details.

¹² CBK (2013)

¹⁴ Ibid., Section 8.3 and CBK (2014), Art. 25(4) as well as Fourth Schedule

¹⁵ Reference date: 31 December 2020.

2.3.2 Pass-through Coverage

The trust deposits held by the EMI at commercial banks enjoy coverage by the Kenya Deposit Insurance Corporation. Coverage is not for the MNO but for each beneficiary, i.e. for each of the e-money users.¹⁶

Thus, e-money is insured by the KDIC through a pass-through arrangement ¹⁷ (sometimes referred to as 'derived protection'), based on funds held by the EMI in a commercial bank for the e-money equivalent. This arrangement ¹⁸ sees e-money effectively treated as equivalent to deposits ¹⁹ held at a traditional deposit taking institutions, and therefore deposit insurance coverage is equal to commercial bank accounts at 500,000 Kenyan Shilling (KES). This approach aims at guaranteeing that, in a case where the deposit taking institution holding float accounts (for EMI customers) fails, individual e-money users are fully protected. ²⁰ Trustees ²¹ of the float accounts would receive reimbursement under the standard deposit insurance framework operated by the KDIC.

3 Impact on deposit insurers

Pass-through coverage is confronted with a number of challenges:

Data on e-money holdings. Upon default of the trust deposit taking institution, the application of pass-through coverage is possible only upon precise and up-to-date information on individual holdings of e-money. Obtaining real time data from e-money issuers has been a challenge considering the size of data and also noting that this is an online system with no clear cut-off time. KDIC has highlighted data collection as an area for development, specifically the collection of data from the service provider directly. Implementation of IT systems to facilitate timely data transmission are expensive and require highly trained staff, placing pressure on limited resources. In addition, the data are at times high in volume and unstructured which adds a considerable layer of complexity during analysis.

Data on users' identity. Kenyan trust law requires that compensation be made directly to the ultimate beneficiaries of the failed member institution. In order for the deposit insurer to be able to compensate users, their identity must be known. In the case of e-money holders, this may be challenging as these hold no relationship with the bank, but only with their MNO. Except for some cases (e.g. M-Shwari), data on users' identity may not be readily available.

Allocating defaults to users. The EMI's float may (or must) be distributed amongst multiple deposit taking institutions. Given default of one of these institutions, this will affect only a share of the total float. The DI will have to take a decision as to how to allocate this loss to the totality of e-money users.

Assessing DI-exposure. MPESA has a limit on the amount of funds a depositor can keep at a time. This maximum balance is KES 300,000 (approximately USD 3,000). The current deposit insurance limit is KES 500,000 (or USD 5,000), which means that all eligible depositors of e-money are effectively protected in full. However, not all MPESA users must be eligible depositors. Hence, the trust deposits will not be fully covered by KDIC and the deposit taking institution and the KDIC are unlikely to be in a position to estimate the exact amount of covered deposits. This introduces an additional consideration for the deposit insurer concerning adequacy of their fund size. Deposit taking institutions holding the float are covered by the deposit insurance framework within Kenya and submit reports/information to the KDIC regarding their deposit liabilities on a monthly basis. The CBK supplements this information by providing risk measures used within the context of its supervision activities.

¹⁶ Kenya Deposit Insurance Act, No. 10 of 2012, Art. 29

¹⁷ Izaguirre and Dias (2019) specify two main deposit insurance approaches to offer coverage for e-money accounts. The *direct approach* aims to address residual risks from the failure of an e-money issuer by making each e-money account eligible for deposit insurance coverage. The *pass-through approach* aims to address residual risks from the failure of a deposit-taking institution holding an EMI's float account. It does so by allowing the coverage to pass through the float account (held at an institutional member of the deposit insurance system) and reach each e-money account.

¹⁸ See Greenacre (2018) for further details on trust accounts and pass-through coverage.

¹⁹ Provided appropriate use of float/trust accounts is in place and maintained.

²⁰ Full protection as the holding limit for MPESA is inferior to the individual deposit insurance coverage by KDIC.

²¹ In Kenya, the trustees must be independent. Neither the EMI nor the deposit taking institution holding the float account can act as a trustee.

²² As of October 2021 – see https://www.safaricom.co.ke/personal/m-pesa/m-pesa-home

On a more general level, the following challenges persist:

Lack of data limits the ability to further calibrate relevant policy and regulation. A ripple effect of poor data is the inability to measure the impact of deposit insurance and e-money on financial inclusion. Without such data, it becomes difficult to draw best practices and articulate success stories.

Deposit insurance legislation explicitly does not cover EMI failure. However, upon such failure, ad-hoc political pressure to provide coverage (by the DI) or activate assistance of another kind (e.g. fiscal intervention of central bank intervention) may be substantial, given the near systemic nature of the service.

4 Impact on depository institutions

The banking sector has not changed in fundamental ways despite the emergence of e-money issuers. Traditional banks have mostly retained their existing customer base, with e-money issuers attracting unbanked customers rather than customers with existing bank customers. This suggests that many e-money customers are either skipping traditional banks and moving directly to a digital-only provider or would have been unlikely to engage with traditional banks at all. E-money customer growth has largely been driven by the expansion of mobile operators and associated coverage, and through a reduction in telecommunication costs for the typical Kenyan consumer.²³ It is yet to be determined whether future growth in e-money may begin to draw customers from the traditional banking sector.

E-money issuers are growing faster than traditional banks in terms of revenue and are continuing to expand their overall customer base (as a share of the population). As of mid-2017, MPESA was generating revenues very close to the two major Kenyan banks (Kenya Commercial Bank and Equity Bank).²⁴

5 Impact on e-money users

The uptake of mobile money has significantly increased overall access to financial services within Kenya. The World Bank attributes this access to a 20% increase in savings by female-headed households, traditionally a demographic where gaps in access have been observed.²⁵ Data from the Communications Authority of Kenya (CA) shows that there are now upwards of 51 million active mobile subscribers that transact 564.8 million mobile money transactions (valued at USD 21 billion) per quarter.

A 2016 study highlighted the positive impact that e-money services have had on levels of poverty in Kenya. ²⁶ They attribute MPESA to lifting 2% of Kenyan households out of poverty. They conclude that "Mobile money has therefore increased the efficiency of the allocation of consumption over time while allowing a more efficient allocation of labour, resulting in a meaningful reduction of poverty in Kenya.". However, views are mixed on this matter, with other studies challenging both the methods and arguments underscoring these poverty reduction claims. ²⁷

MPESA has reached a critical mass in Kenya such that the associated network has potential to offer support for continued growth in market share. This effective monopoly in the provision of e-money services exposes the Kenyan economy to certain risks, including the possibility of customers experiencing price gauging, and creation of potential entry barriers that prevent competitors from emerging. To date however, there has been minimal evidence to suggest that fees are set at exorbitant levels, with a 2011 study concluding that MPESA transaction fees have actually lowered overall costs to consumers across both e-money and money transfer service areas.²⁸

An effective deposit insurance system is one of the key factors towards promoting a more inclusive financial system.²⁹

²³ M-Shwari, offered by Safaricom in collaboration with the Commercial Bank of Africa (CBA), has further consolidated links between e-money users and traditional banking services. M-Shwari is a savings and loan service that enables MPESA customers to earn interest on their savings balance and access instant loans through the NCBA, all linked through their MPESA account. For details see https://www.safaricom.co.ke/faqs/faq/273 or Cook & McKay (2015).

²⁴ Pearson (2017)

²⁵ World Bank (2017)

²⁶ Suri & Jack (2016)

²⁷ Bateman et al (2019)

²⁸ Mbiti & Weil (2011)

²⁹ This does not necessarily imply that deposit insurance frameworks should be explicitly incorporating financial inclusion considerations in their system design.

Based on a survey carried out in March 2018, 80% of AFI's surveyed member institutions viewed that deposit insurance enhances consumers' trust in the formal financial system and is relevant for improving financial inclusion. With the rise of digital financial instruments, there is increased urgency to ensure that the digitally stored values of low-income customers are sufficiently protected.³⁰ Although the total of digitally stored values may be small in absolute terms, they often represent a significant portion of the funds of low-income individuals.

From a deposit insurer perspective, a failure could result in the loss of funds for a large proportion of the Kenyan population in the instance of MPESA. This has the potential to place considerable strain on the financial system, with potential adverse spill-over effects impacting the broader financial system effects, consequences not unlike the failure of a D-SIB. The setback to recent progress in improving access to financial services across the nation could have intergenerational consequences. Because of the overwhelming market share held by MPESA, failure of any smaller player in the e-money realm is unlikely to have far-reaching consequences.

6 Policy considerations for deposit insurers

The case study of e-money in Kenya presents a number of discussion points and areas of policy consideration for deposit insurers. Each of the following offer practical means by which authorities may seek to further engage within e-money within their jurisdiction.

Investing in safety net coordination. Effective safety net coordination is fundamental in enabling new technologies such as e-money to thrive within the existing financial system. This includes government agencies outside of the financial safety net whose mandate is closely tied to the core business of e-money issuers e.g. the communications authority/regulator in the case of Kenya. Central banks, financial supervisors and/or deposit insurer may wish to strengthen the nature of such collaborative relationships given interdependencies in operations and potential overlap in institutional mandate.

Relationships with the tech sector. The tech sector is driving many innovations in the e-money space and has the potential to continue doing so for the foreseeable future. Building and fostering relationships between safety net participants and tech firms encourage mutual understanding of priorities, challenges and pertinent emerging issues. Kenya has demonstrated that building such relationships has been successful in understanding the fast-changing dynamics associated with the non-traditional banking sector.

Data availability. Data is a fundamental pillar informing sound financial supervision, reimbursement by deposit insurers and the adequacy of the deposit insurance fund. Therefore, improving the degree to which regular standardised reports can be collected from the e-money issuer should be a priority consideration. Such work may involve clarification of financial safety net requirements, capacity to the enforced through potential legal codification, and to improve data infrastructure that may delay data transmission.

Leverage experiences of the international community. International organisations continue to explore e-money issuers given the challenges in resolution, impact on financial inclusion and economic expansion in developing nations, as well as the synergies with digital finance and crypto-currencies. The sharing of experiences on the international stage prevents mistakes from being repeated, builds up a knowledge from which to build further, and ultimately to agreement on best practice and official guidance. The KDIC has been very active in the IADI community in terms of discussing their experience with e-money.

Regional agreements and collaborations. The deposit insurer may wish to keep abreast of regional collaborations as they are likely to substantially impact the financial sector context in which e-money issuers operate. The East African Community (EAC) is a regional intergovernmental organisation, headquartered in Arusha, Tanzania, formed by six Partner States: the Republics of Burundi, Kenya, Rwanda, South Sudan, the United Republic of Tanzania, and the Republic of Uganda, with its. This group is working towards the adoption of a common currency, with an expected implementation timeline of 2024. Successful adoption would introduce an additional consideration with regards to insuring depositors and underlying currency risk profiles.

³⁰ Protection in this context does not necessarily mean deposit insurance. Other safeguards (such as segregation/ring-fencing of customer funds) may offer sufficient safeguards in some jurisdictions.

7 References

AFI & IADI. (2020). E-money and Deposit Insurance. Joint Alliance for Financial Inclusion and International Association of Deposit Insurers Issues Paper – unpublished manuscript.

Anyanzwa, J. (2019). How e-money is changing the face of banking. The East African.

Bateman, M., Duvendack, M., Loubere, N. (2019). Is fin-tech the new panacea for poverty alleviation and local development? Contesting Suri and Jack's MPESA findings published in Science. *Review of African Political Economy* 46 (161).

CAK. (2020). Quarterly Sector Statistics Report - March 2020. Communications Authority of Kenya publication.

CBK. (2013). E-money Regulation. Central Bank of Kenya publication.

CBK. (2014). Legal Notice No. 109, The national payment system act. Central Bank of Kenya publication.

Cook, T., McKay, C. (2015). How M-Shwari Works: The Story So Far. Access to Finance Forum.

Gilbert, P. (2020). MPESA has almost 99% market share in Kenya. Connecting Africa.

Gilman, L., Joyce, M. (2012). Managing the Risk of Fraud in Mobile Money. GSMA Mobile Money for the Unbanked.

Greenacre, J. (2018). Regulating mobile money: a functional approach. *Pathways for Prosperity Commission Background Paper Series*.

Izaguirre, J.C., Dias, D., Kerse, M. (2019). Deposit Insurance Treatment of E-money: An Analysis of Policy Choices. *Consultative Group to Assist the Poor (CGAP) Technical Note*.

Mbiti, I., Weil, D. (2011). Mobile Banking: The Impact of MPESA in Kenya. NBER Working Paper Series No. 17129.

Pearson, M. (2017). The Impact of MPESA on Bank Performance in Kenya. Finextra blog article.

Suri, T., Jack, W. (2016). The Long-run Poverty and Gender Impacts of Mobile Money. *Science*. 354 (6317): 1288–1292.

Tarazi, M., Breloff, P. (2010). Nonbank E-Money Issuers: Regulatory Approaches to Protecting Customer Funds. Consultative Group to Assist the Poor (CGAP) Focus Note 63.

World Bank Group. (2017). The Global Findex Database 2017. World Bank Group publication.

Van Roosebeke, B., Defina, R. (2021). Five Emerging Issues for Deposit Insurance. *International Association of Deposit Insurers Policy Brief No. 4.*

Youssef, R., Kushmeider, R., Ellis, D. (2021). Introductory Brief – Challenges for Deposit Insurers. *IADI Fintech Brief No. 1*.