SAFEGUARDING FUNDS STORED IN MOBILE MONEY SYSTEMS

BRIEFING PAPER

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EXECUTIVE SUMMARY

We need new thinking for the protection of customers' funds stored in mobile money systems. And that new thinking should focus on four key regulatory issues: appropriate governance tools for trusts instruments, legal instruments civil law countries can use in the place of trusts, potential systemic risk that can arise through collapse of a major mobile money firm (MM firm), and crisis management tools that can address such a collapse. And we need that new thinking now because of the rapidly growing size of mobile money sectors. Initially launched in 2004, there are now over one billion mobile money accounts in 95 developing countries, processing a combined $US2 billion in transactions every day.

These are the findings from a recent project at the Fletcher School ('Fletcher Project). From 1 August 2018 – 31 August 2020, the Bill and Melinda Gates Foundation funded a research project at the Fletcher School which was designed to examine new thinking in regulatory frameworks across nine 'focus countries': Bangladesh, Kenya, India, Indonesia, Nigeria, Pakistan, Tanzania, Ethiopia and Uganda. The Fletcher School hired Jonathan Greenacre to work on this project under the supervision of Professor Jenny Aker.

This briefing paper explores the findings of the Fletcher Project. It also draws on Dr Greenacre's wider research and work into the regulation of mobile money.

The table on the next page highlights key regulatory issues that emerge in a large number of developing countries and preliminary proposals for reform.

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Table 1: Key Mobile Money Regulatory Issues and Overview of Potential Reforms

Regulatory issue	Issue	Potential Reform
Common law countries - trusts	Unclear obligation to store funds in a trust	Clarify trust requirements
	Potential inconsistency of trust requirements with domestic law	Confirm consistency of trust arrangements with domestic law
	Funds stored within a business unit of the MM firm	Require funds to be stored with a custodian
	Inadequate governance and supervision of trusts	Strengthen rules and supervisory oversight
	Unclear effectiveness of capital requirements	Clarify appropriate capital levels
Civil law countries – trust like instruments	Lack of comparable protection of users' funds to trusts in common law countries	Implement a patchwork of different legal and regulatory tools, including one or more of contractual arrangements, insurance, fiducia arrangements, custodians, capital, and potentially other innovations
Liquidity rules	Lack of or unclear diversification requirements	Develop diversification requirements based on an understanding of the benefits and costs of different assets in which users' funds can be stored
	Potential problems reconciling e-float with liquid assets	Implement reconciliation strategies such as automated monitoring
	Limitations with banking regulation, particularly deposit insurance and/or pass through deposit insurance	Banking regulatory reform, including the potential design of pass through deposit insurance schemes
Crisis management plans	No apparent crisis management plans for MM firms	Develop crisis management plans, starting with the 'Key Attributes of Effective Resolution Regimes for Financial Institutions' issued by the Financial Stability Board

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INTRODUCTION

This paper explores how regulation can protect users' funds in the event of bankruptcy of a firm providing mobile money ('MM firm' or 'MMF') and/or failure of the bank(s) in which users' funds are stored. In this paper note, 'mobile money' means an electronic payments and stored value service provided by MM firms. Such firms can include mobile network operators like Safaricom in Kenya or any other type of non-bank. Mobile money is similar to mobile banking except that mobile money is provided by MM firms, not banks, funds are not intermediated, and usually there are limitations on how people can use their mobile money account.[1] These limitations normally include prohibitions on paying interest to users and restrictions on how much users can store within the system. However, these and other constraints vary across countries. And 'users' include users and different types of 'agents' who deposit and withdraw funds from the mobile money system.

The key claim is that we need new thinking for the regulation of mobile money because of the newness of the service. Banking has existed for at least 800 years. In contrast, mobile money emerged in 2004. There are now over one billion mobile money accounts in 95 developing countries, processing a combined $US2 billion in transactions every day.

The growth of mobile money has had significant benefits in many communities in which it operates.[2] The service also creates risks to customers' funds that require addressing.

New thinking should focus on four key regulatory issues: appropriate governance tools for trusts instruments, legal instruments civil law countries can use in the place of trusts, potential systemic risk that can arise through collapse of a major mobile money firm (MM firm), and crisis management tools that can address such a collapse.

This paper explores these four key regulatory issues in the context of the Fletcher School project. It also involves references to other developing countries, located primarily in the Pacific and South America.

This note has five parts. The first outlines risks created to users' funds and potentially the surrounding economy, and the basic objective of most regulatory frameworks. The second explores appropriate governance tools for trusts instruments. The third proposes legal instruments civil law countries can use in the place of trusts. The fourth analyses portfolio arrangements. The fifth examines crisis management plans for the service, focusing on accelerated bankruptcy regimes. The sixth concludes and suggests next steps in developing new thinking in mobile money.

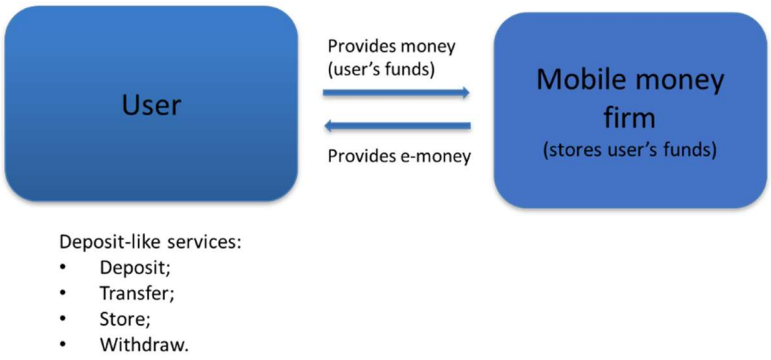
1. RISKS TO CUSTOMERS' FUNDS

We can better understand the risks to users' funds by putting ourselves in the shoes of a user engaging with an MM firm**.** In this case, the user accesses the functions of mobile money by handing over cash and receiving an equivalent amount of e-money on her phone. She normally does so by contracting with cash merchants operating on behalf of an MM firm, as discussed above.

[1] See *The Regulation of Mobile Money*, Oxford BLAVATNIK SCHOOL OF GOVERNMENT PATHWAYS FOR PROSPERITY COMMISSION ON TECHNOLOGY AND INCLUSIVE DEVELOPMENT (2018)

[2] See, for example, Tavneet Suri and William Jack, 'The long-run poverty and gender impacts of mobile money' 2016.

Diagram 1: Accessing Functions



By accessing mobile money, users' funds become exposed to a range of risks, although the newness of mobile money means we are still working out exactly what forms these risks would take. One is 'liquidity risk' in which the MM firm invest users' funds in illiquid business assets, such as a mobile phone tower. This means the MM firm may not be able to liquidate its assets in time to pay out users' funds. This liquidity problem means the firm is insolvent on a cash flow test, meaning it cannot pay debts as they fall due.[3] Another set are 'bankruptcy risks' which arise if the MM firm n invest users' funds in risky assets and otherwise mismanage its assets so that it becomes balance sheet insolvent.[4] This means the firm's assets are worth less than its liabilities.[5]

The treatment of banks and MM firms in financial distress become crucial at this juncture. A policymaker can use crisis management tools to enable a bank in financial distress to avoid entering a country's regular bankruptcy regime. In contrast, without access to crisis management tools, an MM firm in institutional distress will usually enter a country's regular bankruptcy regime. 'Regular' means the type of bankruptcy regime that applies to all non-banking firms.

The corporate bankruptcy regimes of most countries contain two sets of provisions which in turn exposes users' funds to two main risks. The discussion below explores these risks by reference to M-Pesa and Kenya's bankruptcy regime.

1.2.2.1 Loss of Value Risk

Loss of value risk means during bankruptcy proceedings some or all of users' funds may be used to repay debts that the MM firm owes to third party creditors. That means users will only obtain a fraction of what they originally provided to the MM firm. So a user who deposited $100 into a

[3] This means the firm has an inability to pay debts as they fall due: see discussion in Armour J, Awrey D, Davies P, Gordon J, Mayer C and Payne J, *Principles of Financial Regulation* (forthcoming, Oxford University Press 2017).

[4] External factors can cause MM firms to enter financial distress. These include competition from new regulatory changes that significantly reduce the profitability of mobile money, and wider financial and economic cycles which impact upon the assets and liabilities of MM firms. Competition concerns may become increasingly relevant if and when Libra launches across the developing world potentially prompting MM firms to adopt riskier strategies to compete.

[5] This means the firm has an inability to pay debts as they fall due. Armour, note above. In this case, it involves an inability to repay mobile money users on demand. This comprises insolvency on a cash flow test. "Principles for Effective Insolvency and Creditor/Debtor Regimes", The World Bank (2016). <http://pubdocs.worldbank.org/en/919511468425523509/ICR-Principles-Insolvency-Creditor-Debtor-Regimes-2016.pdf>. Note that usually liquidity risk is a temporary issue but can lead to a more permanent balance sheet insolvency problem and ultimately bankruptcy of the MM firm: Ronald Mann, Payment Systems and Other Financial Transactions: Case, Materials and Problems (5th ed, Aspen Publishers 2011) 21. See also Bollen ibid. 39-40 and Geva ibid. 427. This is because, in order to meet liquidity needs, an MM firm may then liquidate assets at a discount to 'hold to maturity' values. Losses on those investments can mean the MM firm is balance sheet insolvency in that its assets are worth less than debts.

mobile money scheme may only receive $50 at the end of bankruptcy proceedings. The remaining $50 is lost to third party creditors of the MM firm.

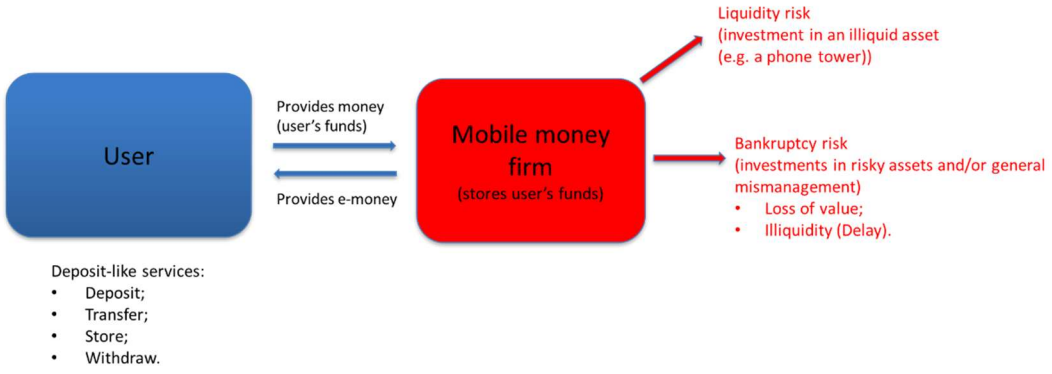
Loss of value risk arises in two conditions. One of these is that mobile money users are classified as unsecured creditors of the MM firm. The other is that the country's bankruptcy regime has a provision which states that unsecured creditors share in any subsequent distribution of the debtor's assets on a pro rata basis. This means, users, as unsecured creditors, are repaid after other creditors of the MM firm have been paid. Kenya has such a provision, meaning M-Pesa users are exposed to loss of value risk.[6]

1.2.2.2 Illiquidity Risk

Illiquidity is a second key risk that can arise through bankruptcy proceedings. This means users' face a *delay* in accessing their funds. Illiquidity risk arises because bankruptcy proceedings in most countries will require creditors of the firm – such as mobile money users – to wait for bankruptcy proceedings to conclude before they can access any moneys that they are due to receive at the end of the process. Kenya's Insolvency Act has such a provision.[7] Such a delay can be extensive. For example, M-Pesa users face significant illiquidity risk due to the relatively slow pace of Kenya's bankruptcy proceedings. The average bankruptcy proceeding in Kenya – judged by reference to a mid-sized hotel chain – takes 4.5 years.[8] Safaricom, as a very large firm processing many millions of transactions, may take much longer than this time frame. Unless there were regulatory frameworks to the contrary, M-Pesa users would be unable to obtain their funds from Safaricom during this time.

The diagram below combines the discussion by outlining the basic operation of liquidity, loss of value, and illiquidity risks. The key is linking functions to investment choices which in turn leads to these risks.

Diagram 2: Key Risks to Users' funds



[6] Substantive rule: Insolvency Act Section 247, 471. Other factors – particularly costs of administering insolvency - can amplify loss of value by reducing the asset pool that can be later distributed. Such costs can include professional fees and other expenses that users incur in making their claims. Delays in distribution may also mean assets depreciate and less is available for collective distribution.

[7] Insolvency Act Section 558. Several factors can amplify illiquidity risk. These include the relatively slow pace of bankruptcy proceedings in developing countries, users' lack of experience in filing claims for funds, administrative challenges in returning funds to users – many of whom may not have bank accounts and so must be reimbursed in cash.

[8] "Explore Economies - Kenya." World Bank, https://www.doingbusiness.org/en/data/exploreeconomies. Accessed 24 Aug. 2020.

Realization of these risk can potentially cause various forms of systemic risk. Section 5 explores potential systemic risk in greater detail.

1.3 The Purpose of Regulation

While we are learning about the risks to mobile money users' funds there is significant consensus on an appropriate objective of regulation: the so-called 1:1 relationship. This means the amount of funds received from the public, which is stored in liquid assets (usually bank accounts), should be equivalent to the amount of so-called 'e-money', i.e. funds stored in people's mobile money accounts. The original M-Pesa model contained the 1:1 relationship, later reflected in a wide number of regulatory frameworks across the focus countries.[9]

The question then becomes: what regulatory tools can support the 1:1 relationship and what trade-offs arise in using them? The next section explores this question, beginning with using trusts to protect users' funds.[10]

2. TRUSTS

Storing users' funds in a 'trust' has emerged as a key regulatory tool across common law countries.[11] Common law countries follow the British legal tradition. When applied to mobile money, a trustee will hold users' funds (trust assets) on behalf of users (as beneficiaries of the trust). Users will then hold a beneficial interest in the trust fund. M-Pesa pioneered this approach.[12]

Trusts can address loss of value risk. This is because, effectively drafted and implemented, a trust has asset segregation effects – it ring-fences users' funds from the assets of the MM firm. This means creditors cannot access users' funds during bankruptcy proceedings.[13] In turn, this means users' funds will retain their full value during corporate bankruptcy proceedings and will be available for users at the conclusion of those proceedings.[14]

The challenge is that many countries require funds to be stored in a trust but provide little, if any guidance, of what should comprise the rules of this instrument and how to ensure that the MM firm and/or a trustee complies with them. For example, Bangladesh's mobile money regulations require users' funds to be stored in a trust account.[15] However, there is no guidance about what rules or supervisory arrangements apply to the trust account. Instead, regulatory provisions simply

[9] This is central to the disclosure in M-Pesa, namely that all of users' cash is held 'on trust' and can be redeemed: see M-Pesa Terms and Conditions, Clause 1 (''[E]-money' means the electronic monetary value depicted in your M-Pesa account representing an equal amount of Cash held by the Trustee and which may be redeemed through an M-Pesa Cash Merchant for an equal amount of Cash' and ''Trust Deed' means together the Declaration of Trust dated 23rd January 2007 and the M-Pesa Amendment Deed dated 19th June 2008 executed by the Trustee constituting the trusts under which the Trustee holds all amounts of cash received for your Account') and 2.9 ('Your cash represented as e-money is held in trust for you'). For Nigeria see: Guidelines on Mobile Money Services in Nigeria', Clause 7.5(f). Kenya: 25(3)(b) ensure all monies received are held in a Trust Fund; and 25(3)(c) that Trust balances be no less than total money balances at all time. Rwanda: E-money issuers must retain one hundred percent (100%) of electronic money in circulation (MFS Regulation, Section 17)); Bangladesh: MFS Regulations, Section 7.5(i).

[10] Future papers need to examine the 1:1 relationship in the context of other, more recent innovations in mobile money. See, for example: https://www.safaricom.co.ke/personal/m-pesa.

[11] See Bangladesh: Clause 7.5(i), Bangladesh Mobile Financial Services (MFS) Regulations, 2018; Kenya: NPS Regulation 25 requires all subscriber funds to be held in a Trust. Regulation 26 specifies the minimum requirements for the Trust. Tanzania: -Money Regulations, Part V.

[12] See discussion above about requirements in M-Pesa's trust terms.

[13] See a discussion of this point in Jonathan Greenacre and Ross Buckley, 'Using Trusts to Protect Mobile Money Users', (2014) Singapore Journal of Legal Studies, 59-78.

[14] Ibid.

[15] Bangladesh: MFS Regulations Section 7.5(i).

state that the amount of e-money issued to the public must be equivalent to the amount stored in the 'nominated trust cum settlement accounts of the [MM firm] with scheduled commercial bank(s) and invested amount in Government Securities.'[16]

Insufficient rules and/or oversight matters because of the potential for commingling, which can make a trust legally invalid. Here commingling means the MM firm and/or trustee may mix users' funds – stored in the trust account – with the firm's other assets. A firm may be particularly interested in doing so if it is facing liquidity problems and needs more assets, such as users' funds. Commingling can make the trust legally invalid which in turn means this instrument does not protect users' funds against loss of value risk.[17]

A policymaker can take several steps to effectively design and supervise a trust account. We look at three below.

2.1 Establishing A Trust

A policymaker can require an MM firm to take two main steps to support the legality of a trust. One is require the MM firm to use a *trust* deed. This is a legal document that outlines how the trust relationship between the trustee and users (as 'beneficiaries' of the trust) will operate. A second is require that this trust deed contains a *declaration of trust.* This means the trustee declares that it holds users' funds ('trust assets') on behalf of users.[18]

A trust deed and declaration of trust are useful because they provide strong intention to establish a trustee relationship between the trustee and users, which in turn contributes to the legality of the instrument.[19] Alternatives involve a person using a non-trust document (such as a regular contract) and/or not including a declaration of trust. These alternatives provide weaker intention to establish a trust arrangement.

2.2 Terms of the Trust

Trust legislation can provide guidance on the type of rules that should be involved in a mobile money trust. Such rules comprise 'trustee duties' towards users and so, by extension, users' funds. Legislative instruments can be useful because they codify a range of trustee duties which have evolved over centuries of trust law. Such duties can be imported into a mobile money trust instrument. For example, New Zealand's Trusts Act contains particularly useful trustee duties.

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[16] Ibid.

[17] In such circumstances there a risk that the trust arrangement will not meet one or more of the three certainties. A court may conclude that an MM firm did not evince the necessary intention to hold the funds on trust, and/or, if the funds were mingled, that it is not possible to identify which funds it was supposed to have segregated: See the case of Re Goldcorp [1994] UKPC 3 in which the firm promised to hold assets on trust but failed to do so and the users received nothing in its insolvency: Roy Goode, Principles of Corporate Insolvency Law, 4th edn, Sweet & Maxwell, (2011) 213. See a discussion of the three certainties in Knight v Knight (1840) 49 ER 58. See earlier discussion in Wright v. Atkyns (1823) Turn. & R. 143, 157, per Lord Eldon: "...first...the words must be imperative...; secondly...the subject must be certain...; and thirdly...the object must be as certain as the subject". For additional discussion on various components of the three certainties, see Intention to Create a Trust Inferred from Circumstances, Re Kayford (1975) 1 WLR 279.

[18] Using Trusts to Protect Mobile Money Users, Singapore Journal of Legal Studies
59 co-authored with Ross Buckley (2014). For example, in Papua New Guinea, Digicel PNG and Post PNG use trust deeds, each of which contains a declaration of trust. See Jonathan Greenacre and Ross Buckley, Trust Law Protections for E-Money, Pacific Financial Inclusion Program and Alliance for Financial Inclusion, co-authored with Ross Buckley (2013).

[19] Using Trusts to Protect Mobile Money Users, Singapore Journal of Legal Studies 59 co-authored with Ross Buckley (2014).

2.3 Supervision of the Trust

Any trust rules implemented above must be monitored and enforced, making supervision important. This section explores different supervisory options.

A particularly useful approach involves a public actor can monitor and enforce trustee duties in a mobile money trust on behalf of users, using administrative powers. One model is the United Kingdom's Charity Commission. This actor registers and regulates charities in England and Wales. The Charity Commission also removes charities that are not considered to be charitable, no longer exist or no longer operate.[20] The UK Charity Commission can take a number of actions should it believe that a charity is no longer operating in a charitable way, including restrict the transactions into which a charity may enter, appoint additional trustees, freeze a charity's bank account, and/or suspend or remove a trustee; and appoint an interim manager.

A regulator could adopt a role similar to the UK's Charity Commission in relation to the mobile money trust. It could monitor the trust arrangements, checking both compliance with trustee duties and the 1:1 relationship in general. The state could then take similar actions to those listed above in the event that the trustee was not complying.

2.4 Technology

Technology could also be particularly useful at this juncture. A regulator could invest in an automated check of the 1:1 relationship. This involves reconciling the total of all trust investments against the amount of e-money issued to the public. This could potentially be done daily and could come with an in-built warning notification for the trustee and/or regulators if the 1:1 relationship has been breached.

2.5 Preliminary issues

There are several specific important issues with trusts which require attention. These are outlined below.

2.5.1 Unclear trust obligation – preliminary proposal: confirm trust requirements

Regulators in some countries appear to believe that MM firms must store users' funds in a trust, but requirements to do so are often unclear. For example, Nigeria does not have clear trust obligations, although the Central Bank of Nigeria (CBN) may impose such requirements during the licencing stage. For example, when obtaining a license, an mobile money operator (MMO) must have implemented 'risk management processes'[21], must have implemented risk mitigation techniques that address 'liquidity' and 'financial' risks,[22] and must have put into place 'adequate measures to mitigate all the risks that could arise from the deployment and use of its mobile

[20] "About Us." GOV.UK, https://www.gov.uk/government/organisations/charity-commission/about. Accessed 24 Aug. 2020.
[21] Guidelines, Section 7.6.
[22] Guidelines, Section 13.1(a). See also Mobile money Regulatory Framework, Section 11.

payment services'.[23] This makes it conceivable that the CBN could require MMOs to store funds in trust accounts as part of efforts of ensuring MMOs have the required techniques in place, but it is not clear whether this happens in practice.

Another way in which MMOs may be subject to the requirement to store funds in a trust is that doing so appears to be a requirement before an MMO can access pass through deposit insurance, but this is unclear. This is because MMOs must store all users' funds in a bare trust account in order to be eligible for pass through deposit insurance.[24] However, it is conceivable that a firm could provide mobile money and elect to not be subject to pass through deposit insurance, or fail the requirements needed to obtain this service. In this case, the MMO would have no need to store funds on trust.

Moving forward then, all regulators could benefit from carefully checking trust obligations under their regulations. This would involve ensuring that regulatory frameworks clearly do specify that funds must be stored in a trust account.

2.5.2 Potential inconsistency of trust arrangements with trusts legislation and court cases – preliminary proposal: confirm consistency

Another preliminary issue is that mobile money trust requirements may not be consistent with domestic trust and other legislation and so would be upheld in court if and when challenged. Trust law is a complex area stretching back over many centuries of court decisions and legislation, particularly from the United Kingdom. Common law countries will have imported some or all of the principles of trust law originating from the United Kingdom. Each country will have also added its own principles and requirements to those imported from the United Kingdom.[25] Trust arrangements must also be recognized under each country's insolvency regimes.

As a result, each common law country would benefit from a careful check of the legality of their trust arrangements. This would involve checking the legality of the mobile money trust arrangements with trust, insolvency and other areas of regulation and law.

2.7 Funds stored within a business unit of a MM firm, impeding monitoring and resolution - preliminary proposal: require MM firms to store funds with a separate firm, labelled a 'custodian'

Restrictions on use the of funds – namely storing funds in a separate account and only using them for mobile money-related transactions - can make it less likely an MM firm faces a liquidity

[23] Guidelines, Section 8.2(i).
[24] Note this requirement is not outlined in the 'Guidelines on Mobile Money Services in Nigeria'. Instead, it only appears to bind providers accessing pass through deposit insurance (Framework for the Establishment of Pass-Through Deposit Insurance, Clause 4.2, 7.1 and Clause 5. Nigeria Deposit Insurance Corporation (Pass Through Deposit Insurance) Regulations (made pursuant to Section 56 of the NDIC Act, 2006). A 'bare trust' means the trustee holds the property without any duties except to convey it back to the beneficiary on demand, and to deal with it as the beneficiary directs.
[25] Trustees Act, 1948 (Kenya); Trustees' Incorporation Act 1956 (Tanzania); Trustees Act, 1888 (Nigeria); Trustees Incorporation Act (1939) and Trustees Act (1954) (Uganda); The Trusts Act, 1882 (Pakistan); Indian Trusts Act, 1882 (India); Trusts Act, 1882 (Bangladesh); Bank Indonesia Regulation Number No.14/2012 on Taxation of Trust Services.

problem. This is because, so long as funds are, in fact, stored separately and in liquid assets, the MM firm will always be able to redeem users' requests to 'cash out' their funds.

Furthermore, storing funds in a separate business unit can make it simpler to monitor how funds are being used and transfer funds from an insolvent to solvent MM firm. Monitoring is simpler because users and/or the regulator can obtain separate records on the business unit rather than having to identify mobile money-related transactions moving through the MM firm's general accounts. For the same reason, the regulator can more easily identify transaction and funds that need to be extracted from an insolvent MM firm and moved to a solvent firm.

However, monitoring and resolution may still be complicated because the entity providing mobile money is the same as the entity providing mobile phone services, which also include voice, data and internet. This means a policymaker would need to determine which of the assets and funds of the MM firm were specifically for mobile money and so could be transferred to another MM firm and which were not. Determining these matters may take time which could mean there is a significant disruption in a country's payments system until decisions are made.

One method of strengthening this requirement involves drawing upon governance rules in M-Pesa and regulation in Tanzania and requiring MM firms to provide mobile money through a separate legal entity which would store, transfer, and redeem funds. In M-Pesa, Safaricom never receives users' funds. Instead, they are paid directly to another firm, called the 'M-Pesa Holding Company' (MPHC).[26] This approach creates the following distinction. Safaricom performs mobile money services and facilitates mobile money transactions. The MPHC actually performs payment function because this firm, not Safaricom accepts, stores, transfers, and pays out funds. Tanzania broadly mirrors the M-Pesa governance structure, by requiring firms to provide mobile money through a separate legal entity. [27] The separate legal entity also requires a license from the BOT as an e-money provider.[28]

[26] M-Pesa Amendment Deed, Clause (E); M-Pesa Trust Deed, Clause 2(i). Note that Safaricom has various contractual methods to control actions of the MPHC which could also lead to co-mingling. This is because Safaricom operates as an 'agent' of the MPHC. M-Pesa Amendment Deed, Clause 7.1. As a result, Safaricom gains the contractual right to operate the commercial bank accounts in which users' funds are stored. Safaricom can also effect payments from the trust fund back to users who wish to redeem their funds. Authorized Safaricom personnel are signatories of the bank account under the name of the MPHC. M-Pesa Amendment Deed, Clause 7.1(a).

[27] Under the NPS Act and the Payment Systems Licensing and Approval Regulations, 2015. Yes, they need a license as PSP and Mobile money issuer before they can start operations. See Mobile money Regulations 2015, Part II. See NPS Act 6(1).

[28] NPS Act and Mobile Money Regulations, 2015.

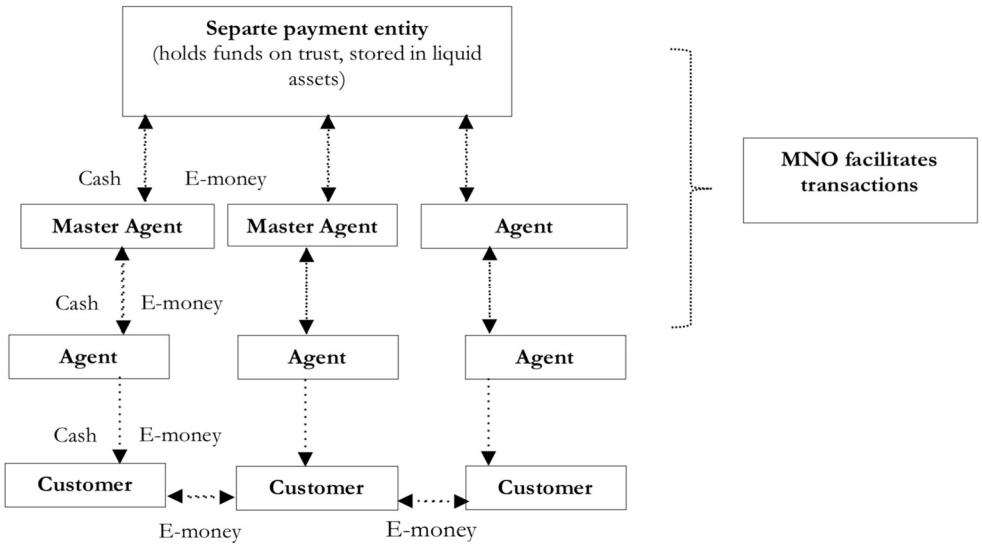

Diagram 6: Separate Payment Entities

Requiring MM firms to use a separate firm makes it even simpler to monitor and transfer funds from an insolvent to solvent MM firm than if a separate business unit is used because it creates a clear distinction between the mobile money and non-mobile money businesses. Users and/or the CBK could only need to monitor how funds are being deposited, stored, transferred, and withdrawn by the relevant subsidiary, which is simpler because there would not be non-mobile money transactions complicating this process. This means the separate company's funds will be mobile money funds only, rather than the more extensive set of a funding and transactions involved when an MM firm provides mobile money as well as mobile phone-related services.

2.5.3 Alternatives – unclear appropriateness of capital – preliminary proposal: confirm capital levels

Capital buffers are another method to protect users' funds. This involves requiring the MM firm to hold capital against its mobile money liabilities.

Capital is a form of private insurance and so can reduce the probability that an MM firm enters financial distress. Such obligations require the MM firm to use its own capital to meet losses of users' funds.[29] Put alternatively, capital acts as a buffer, reducing the risk that the MM firm will become insolvent as a consequence of a decrease in the value of its investments. This instrument does not, in itself, operate in bankruptcy proceedings to address loss of value or illiquidity risks.

There are also a number of important considerations involved in capital requirements, one of which is: how much capital is appropriate for MM firms? As of yet, there is no policy guidance on this point because it will depend upon the likelihood of failure of the MM firm's investments or

[29] In this sense, capital requirements have a similar purpose to when it is imposed on banks and other financial institutions: Capital rules aim to ensure that shareholders' equity funds a minimum proportion of the current value of the bank's assets. This aims to increase the likelihood that a bank can absorb losses on the assets side of its balance sheet without becoming insolvent and triggering a run on its deposits or other short-term funding: Armour and others (n 2) Chapter 14, 296.

unexpected drops in income, which will vary across asset classes and jurisdictions. Potential capital levels will also depend upon the likelihood of loss due to internal actions of the MM firm. The absence of failure of MM firms means it is difficult to predict what capital levels are required. There is also a potential trade-off between capital levels. Higher levels of capital can have consumer protection benefits. It builds the credibility of the 1:1 relationship by increasing the likelihood that the MM firm can fully reimburse users in the event of financial distress. Doing so can also have financial inclusion benefits because regulators and/or unbanked people may be more likely to trust the service.

However, greater capital requirements can increase compliance costs on the MM firm which may impede financial inclusion.[30] These greater compliance costs may be passed onto users in the form of higher fees, making the service unaffordable for users 'at the margins'.[31] Furthermore, capital requirements that are set too high might also create less interest on the part of investors to establish or invest in MM providers, as investors may feel that the returns will be insufficient relative to the capital outlay required. In turn this means that higher capital requirements may also prevent smaller, potentially more innovative MM firms from entering the sector. Barriers to entry of this kind may inhibit competition and innovation in mobile money, which in turn impairs the spread of this service to larger numbers of low-income and unbanked users.

3. TRUSTS-LIKE INSTRUMENT FOR CIVIL LAW COUNTRIES

We need new thinking for asset segregation in 'civil law' countries because trusts are not generally recognized in such jurisdictions.[32] Civil law countries follow Continental European legal traditions. Some civil law countries have tried to implement trusts through international treaties, but usually there are very few members of such arrangements.[33] This means that civil law countries cannot simply codify common law features of a trust in domestic regulation.

The newness of mobile money means we have little understanding of which alternative instruments civil law countries can use to segregate assets and protect users' funds from bankruptcy of the MM firm. Reflecting that lack of understanding, civil law countries often state that asset segregation must take place but do not specify an instrument that makes such an arrangement legally valid. For example, Ethiopia states that users' funds 'belong to users… and [are] managed on behalf of

[30] This is because equity capital is the most costly to raise for this firm, as an exception to the Modigliani and Miller theorem. Franco Modiglian and Merton H. Miller, 'The Cost of Capital, Corporation Finance and the Theory of Investment' (1958) 48(3) The American Economic Review 261 <https://assets.aeaweb.org/assets/production/journals/aer/top20/48.3.261-297.pdf> 30 December 2016; Franco Modigliani and Merton H. Miller, 'Corporate Income Taxes and the Cost of Capital: A Correction' (1963) 53(3) The American Economic Review, June 1963, 433 <https://www2.bc.edu/~chemmanu/phdfincorp/MF891%20papers/MM1963.pdf> accessed 29 December 2016; Serena Fatica, Thomas Hemmelgarn and Gaëtan Nicodème, 'The Debt-Equity Tax Bias: consequences and solutions' (2012) European Commission Taxation Papers, Working Paper 33
<https://ec.europa.eu/taxation_customs/sites/taxation/files/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_33_en.pdf> accessed 29 December 2016; and James A. Miles and John R. Ezzell, 'The Weighted Average Cost of Capital, Perfect Capital Markets, and Project Life: A Clarification' (1980) 15(3) The Journal of Financial and Quantitative Analysis, September 1980, 719 <https://www.jstor.org/stable/2330405?seq=1#page_scan_tab_contents> accessed 29 December 2016.

[31] See an introduction to the term 'at the margins' in Section 2.2.

[32] I am indebted to David Ramos Muñoz, Javier Solana, & Ross Buckley et al., "Protecting Mobile Money Customer Funds in Civil Law Jurisdictions" (2016) 65 International and Comparative Law Quarterly 705 for a significant portion of the material in this section.

[33] Such as the Hague Convention of 1985 on the Law Applicable to Trusts and on their Recognition. Italy has ratified the Convention. See Michele Graziadei,
"Recognition of Common Law Trusts in Civil Law Jurisdictions under the Hague Trusts Convention
with Particular Regard to the Italian Experience" in Lionel Smith ed., Re-imagining the Trust: Trusts in Civil Law (Cambridge: Cambridge University Press, 2012).

the mentioned users,[34] an MM firm must segregate its own funds from that of users,[35] and an MM firm must 'not co-mingle users' funds with those of third parties and must insulate them against the claims of other creditors of the firm.'[36] Brazil gives users the right to segregate their assets from the assets of the insolvent firm's estate.[37] Yet another approach, used in the European Union, involves specific rules that ban the comingling of funds.[38] Furthermore, in Chad, Congo, and El Salvador, users' funds must not be subject to 'attachment' by creditors of the MM firm.[39] In other countries, such as Paraguay, users' funds must be treated as 'autonomous assets' that are not subject to seizure by creditors of the MM firm.[40]

The central problem is that there is no legal instrument – such as a trust - that actually translates these asset segregation requirements into specific legal obligations. This means these provisions appear to have little or no effect in law.

The discussion below begins new thinking on this topic by mapping out a patchwork of tools, outlined in Table 3, that civil law countries can use to protect user's funds. The legal effectiveness of many of these tools is unclear, however classifying them in the manner discussed below can potentially provide an initial framework for exploring their operation.

Table 3: A Patchwork of Tools for Civil Law Countries

Purpose	Legal Instrument
Minimize exposure to risks	Storage caps
Minimize the likelihood that an MM firm becomes financially distressed	Restrictions on use
	Custodian
	Mandate contract
	Capital
Apply if/when an MM firm enters financial distress	Fiducia/fideicomiso contracts
	Private law arrangements
	Insurance

The discussion below provides additional details on these different tools.

3.1 Minimize Exposure to Risks

Limits on how much money people can store and transfer through mobile money can minimize people's exposure to risk that come from failure of a MM firm. By analogy, a person can generally store as much of her personal wealth as she wants in her bank deposit. This means collapse of the bank can destroy her asset base. Limitations on how much someone can store in her mobile money account reduces her exposure.

[34] Payments Directive, Section 10(3).
[35] Payments Directive, Section 10(12).
[36] Payments Directive, Section 15(2).
[37] See Reglamento de Fideicomiso contenido en la Recopilación de Normas para Bancos y Entidades Financieras (RNBEF), Chapter XVII, Article 7; in Brazil, Circulares BC Brasil No. 3682 and 3683; in Peru, Resolución SBS No. 6286-2013.
[38] 2007/64/EC Payment Services Directive, Article 9. https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A32007L0064.
[39] Chad: Regulation on E-Money Issuance 2011, Regulation 15; Congo: Instruction on E-Money Issuance (date unclear), Article 18; El Salvador Ley para Facilitar la Inclusion Financiera (undated), Article 10.
[40] Ley No. 921 de Negocios Fiduciarios (undated), Articles 10 & 13.

Storage and transaction caps on mobile money can also facilitate other innovations that can leverage surrounding regulatory frameworks. One model is a partnership between Safaricom and the Commercial Bank of Africa (CBA), launched with the CBK's approval on 27 November 2012.[41] A customer can transfer funds from her M-Pesa account to a linked M-Shwari bank deposit provided by the CBA. Unlike M-Pesa, M-Shwari was specially designed, regulated, and marketed as a savings service.[42] A customer can obtain an interest rate of 6% through her M-Shwari deposit and her funds are fully protected by bank regulation. A key benefit is that she can transfer any savings in her M-Pesa account into her M-Shwari bank deposit which is then protected by bank regulation.

3.2 Prevent institutional distress

A second set of tools operate to minimize the likelihood of financial distress (liquidity or bankruptcy problems) of a MM firm in a civil law country. They operate by requiring the MM firm to invest user's funds in safe, liquid assets and otherwise operate in ways which minimize the likelihood of financial distress.

3.2.1 Restrictions on Use

Restrictions on use specify that users' funds cannot be used for anything other than mobile money transactions and are stored in liquid assets. Effectively implemented, this reduces the likelihood that users' funds are used for the type of illiquid or risky investments that can lead to liquidity and bankruptcy problems for the MM firm, respectively. For example, Indonesia and Ethiopia have extensive provisions surrounding restrictions on the use of funds.[43] in Indonesia, funds must be stored as an immediate liability post or various liabilities, at least 30% of float funds in cash or on demand deposit at deposit taking 'BUKU banks' (meaning core capital of $2.308 billion), and a maximum of 70% of the float funds must be placed on securities / financial instruments issued by the Government or Bank of Indonesia (Indonesia's central bank), or an account with Bank Indonesia.

3.2.2 Custodian

Most regulatory frameworks permit an MM firm to store users' funds within one if its own business units. So, for example, a mobile phone company providing mobile money can store users' funds in one of its general accounts. Regulatory frameworks in civil law countries appear to permit this model. For example, some Latin American jurisdictions require MM firms to provide the service through a separate firm.[44] However, this separate firm may provide a range of transactions in relation to mobile money, such as registering accounts, dealing with complaints, and addressing fraud *in addition to* storing, transferring and receiving users' funds. Conceivably, users' funds

[41] Vodafone, 'Safaricom Launches M-Shwari - Offering Interest and Loans - On M-Pesa' (Vodacom, 27 November 2012) <http://www.vodafone.com/content/index/media/vodafone-group-releases/2012/m-shwari.html> accessed 9 April 2016. As explained in Chapter 1, 'CBA' is an abbreviation for the Commercial Bank of Africa.
[42] ibid.
[43] Section 14 of Bank Indonesia Regulation Number 20/6/PBI/2018 on Electronic Money. For example, in Ethiopia, users' funds must be deposited in an 'account maintained with a bank and invested in Government securities' Payments Directive, Payments Directive, Section 10(3).
[44] See Reglamento de Fideicomiso contenido en la Recopilación de Normas para Bancos y Entidades Financieras, Chapter XVII, Article 7; in Brazil, Circulares BC Brasil No. 3682 y 3683; in Peru, Resolución SBS No. 6286-2013.

could be mixed up in those other transactions. For example, an MM firm may reimburse one user for fraud by drawing upon the general pool of funds received from users.

A 'custodian' model can strengthen protections against distress of an MM firm. This model involves storing funds with a separate firm.[45] This separate firm would simply receive, store, transfer and withdraw funds.

The M-Pesa service in Kenya uses this approach. Safaricom, the firm providing M-Pesa, never receives users' funds. Instead, they are paid directly to another firm, called the 'M-Pesa Holding Company' (MPHC).[46] This approach creates the following distinction. Safaricom performs mobile money services and facilitates mobile money transactions. The MPHC actually performs payment functions because this firm, not Safaricom, accepts, stores, transfers, and pays out funds.

The M-Pesa custodian model can strengthen protections against distress of an MM firm in the following ways. One of these is users and/or policymakers can more easily monitor whether the MM firm is complying with the 1:1 relationship and wider requirements in regulation. This is because users and/or policymakers must only monitor how the custodian deposits, stores, transfers and withdraws funds, not other transactions that an MM firm might perform in the course of providing the service. Addressing fraud is a useful example, as discussed above.

Furthermore, collapse of the MM firm does not, in itself, directly cause loss of value or illiquidity risk. This is because users' funds are stored within a separate firm, which presumably, is not insolvent.

And finally, storing funds with a custodian makes it is easier for a regulator to transfer users' funds to another, solvent firm which can address liquidity, loss of value and illiquidity risks if and when they arise. Section 5 below explores this point in greater detail.

Civil law countries appear to have legal arrangements for other types of services that are similar to custodians, but their precise legal effect is unclear. For example, in the Netherlands, an investor and intermediary can establish and jointly own a collective pool of eligible securities. Since these securities are jointly held, they are not legally classified as the intermediary's assets. Thus, intermediary's creditors have no claim against the jointly held securities even if they have one against individually held securities.[47] Other civil law regimes such as Mexico, France, Italy, Bolivia, Peru and Quebec allow for the existence of a separate patrimony that is protected from insolvency.[48] Since neither the settler, fiduciary nor beneficiary has any real property rights over the assets, they are not affected if the fiduciary becomes bankrupt.

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[45] Joanna Benjamin, Financial Law (Oxford University Press 2007).

[46] M-Pesa Amendment Deed, Clause (E); M-Pesa Trust Deed, Clause 2(i). Note that Safaricom has various contractual methods to control actions of the MPHC which could also lead to co-mingling. This is because Safaricom operates as an 'agent' of the MPHC. M-Pesa Amendment Deed, Clause 7.1. As a result, Safaricom gains the contractual right to operate the commercial bank accounts in which users' funds are stored. Safaricom can also effect payments from the trust fund back to users who wish to redeem their funds. Authorized Safaricom personnel are signatories of the bank account under the name of the MPHC. M-Pesa Amendment Deed, Clause 7.1(a).

[47] The Netherlands' Securities Book-Entry Transfer Act Materially Amended. https://news.bloomberglaw.com/securities-law/the-netherlands-securities-book-entry-transfer-act-materially-amended. Accessed 16 Aug. 2020.

[48] We can define a patrimony as an autonomous mass with a set of assets answerable for the set of liabilities. F. Barrière, 'The French Fiducie, or the Chaotic Awakening of a Sleeping Beauty' in
LD Smith (ed), Re-imagining the Trust: Trusts in Civil Law (Cambridge University Press 2012), 251. For example, in Quebec, the arrangement used is known as a patrimoine d'affectation (patrimony by appropriation). This arrangement "constitutes a patrimony of autonomous use and

France and Germany also use civil law asset securitization frameworks which can potentially operate as a custodian. Selected assets are transferred to a "Special Purpose Vehicle", which can either be created for a specific securitization transaction or reserved for use for multiple transactions. This Special Purpose Vehicle can then be registered as a separate legal entity in the form of a corporation, a partnership or a limited liability company.[49]

We need new thinking on how different custodian models can be adapted to mobile money. This is because we do not know exactly how such models operate during bankruptcy proceedings. For example, under certain conditions, insolvency of a firm can be extended to other companies within the same group, potentially including a custodian. These circumstances can include so-called 'piercing the corporate veil', when a court holds a shareholder responsible for the actions of the corporation as if it (the corporation) were the actions of the shareholder, and potentially fraud.[50] Further research and possibly one or more court cases will be required to clarify the precise legal effectiveness of custodians.

3.2.3 Mandate contract

Many civil law countries have 'mandate contracts' which operate in the following way:

- One party (the agent) commits to act in the interests of another (the principal) in exchange for a fee;
- The agent is responsible for carrying out the objectives mandated by the principal and under the conditions outlined in the contract.

A mandate contract can be tailored to mobile money. This is because users (principals) will hand over funds to an MM firm (agent).

A mandate contract cannot achieve funds segregation and so cannot protect users' funds against loss of value and illiquidity risks. This is because, when the user purchases e-money from the MM firm, he/she exchanges proprietary rights over the funds for the right to transact using e-money. Thus, the user no longer owns the funds – they become the assets of the MM firm.

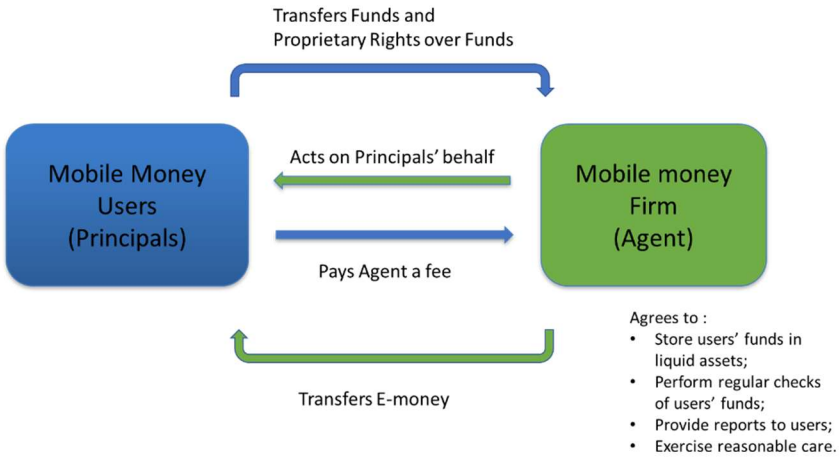
However, a mandate contract can contain rules requiring the MM firm (as agent) to operate prudently and protect users' funds, which reduces the likelihood that this actor enters financial distress and ultimately insolvency. For example, provisions in a mandate contract could state that the MM firm must store users' funds in liquid assets, perform regular checks of users' funds, provide reports to users, and otherwise exercise reasonable care.

Diagram 3: Mandate Contract between Mobile Money Users and Mobile Money Firm

distinct from that of the settlor, the trustee or the beneficiary, over which none of them has real rights." Civil Code of Quebec 1991, Clause 64, Article 1261.

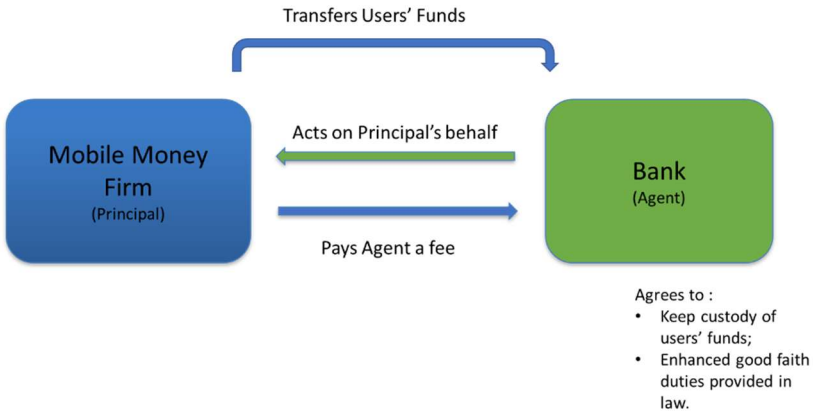
[49] See: Lina Aleknaite, Why the Fruits of Capital Markets are Less Accessible in Civil Law Jurisdictions or How France and Germany Try to Benefit from Asset Securitization, 5 DePaul Bus. & Com. L.J. 191 (2007), p. 196.

[50] Ramsay, Ian, and David B. Noakes. Piercing the Corporate Veil in Australia. SSRN Scholarly Paper, ID 299488, Social Science Research Network, 8 May 2002. papers.ssrn.com, https://papers.ssrn.com/abstract=299488.



A mandate contract could also be used between the MM firm and the bank(s) in which users' funds are stored. The MM firm could require the bank to keep custody of user's funds according to the duties outlined in the contract. The bank (as an agent) would be bound by the duties listed in the contract or the more advanced good faith duties stipulated by law, similar to a fiduciary under a fiduciary contract. Such tools may reduce the likelihood that the bank enters financial distress, which in turn protects users' funds stored in the bank account.

Diagram 4: Mandate Contract between a Mobile Money Firm and a Bank



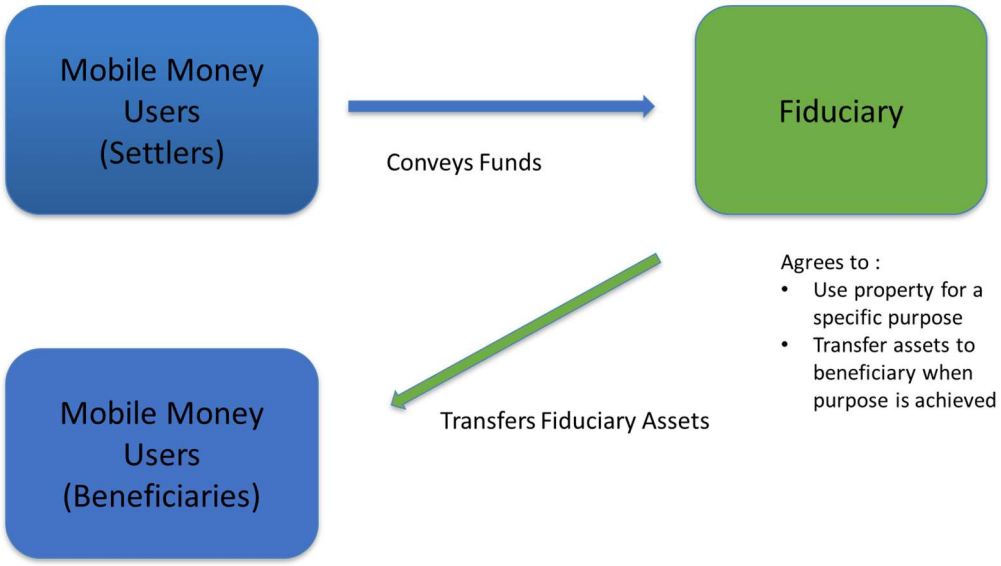
3.3 Tools for Institutional Distress

The second bundle of tools can become part of a civil law country's patchwork of protections for users' funds by operating if and when an MM firm becomes insolvent. This material below comprises new thinking because it involves discussing tools that are yet to be designed for mobile money. Further research is required into their potential operation.

3.3.1 Fiduciary Transactions

Some civil law countries require MM firms to hold users' assets under a fiduciary contract, which then take the form of certain arrangements such as a *fiducia* in France and *fideicomiso* in Latin American countries.[51] A fiduciary transaction is an arrangement under which one party – the settlor – conveys property to another – the fiducia – and the latter agrees to use that property for a specific purpose. In addition, the fiduciary agrees to transfer the fiduciary assets to one or more beneficiaries upon fulfillment of the agreed purpose.[52]

Diagram 5: Fiduciary Contract



Civil law countries can use fiduciary arrangements for mobile money if such contracts are drafted carefully. In this scenario, the MM firm will be considered a fiduciary and users will be beneficiaries.[53]

A fiducia contract can achieve fund segregation goals and so protect users' funds against loss of value risk, although two points require careful consideration. One of which is a lack of background governance rules for fiducia contracts. Usually, trusts outline a range of explicit and implicit duties of a trustee to beneficiaries. In contrast, fiduciary contracts do not have general background rules outlining the fiduciary's duties to users.[54]

As a result, a regulator wanting to protect users' funds through a fiduciary contract will need to specify clear duties of the fiduciary, potentially through a mandate contract. Such duties can include 'fit and proper' tests for the fiduciary and arrangements requiring the safe storage of funds.

[51] See Peruvian E-Money Act, Article 6.1.
[52] Note that usually the fiduciary contract will specify the identity of these beneficiaries. Sometimes the seller or any third party as specified in the contract may be beneficiary of the fiducia. Sergio Cámara Lapuente, "Trusts in Spanish law" in M. Cantin Cumyn ed., Trust vs Fiducie in a Business Context (Brussels: Bruylant 2000) 197. On other occasions, the fiduciary may be designated as beneficiary (See Code civil des Français, Article 2016). This approach is prohibited in many Latin American jurisdictions; See Article 8.1 of Paraguayan Ley 921/96 de Negocios Fiduciarios or Article 265.4 of Peruvian Ley 26.702, General del Sistema Financiero y del Sistema de Seguros y Orgánica de la Superintendencia de Banca y Seguros.
[53] This approach is less common in Latin American jurisdictions. See, for example, Uruguay: Ley no 19.210 de Inclusión Financiera, Article 5.
[54] See David Ramos Muñoz, Javier Solana, & Ross Buckley et al., supra note 30 at 725.

A second, more fundamental problem is that fiduciary contracts are not universally recognised and do not necessarily have the same effect across civil law countries.[55] These factors depend on the will of the parties[56] and/or the operation of the law.[57]

Moving forward, a fiduciary contract can be effective when a country's jurisdiction:

- Recognises the legality of this legal instrument;
- Classifies fiduciary assets (users' funds) as separate from the assets of the MM firm; and
- Recognises the validity of a contractual clause that states that insolvency of the MM firm is a valid 'agreed purpose'. This may mean that insolvency of the MM firm permits users' funds to be transferred to users (as beneficiaries).[58]

The newness of mobile money means we do not know exactly how fiduciary instruments will operate during insolvency of an MM firm. Court cases involved with such insolvency may provide the type of clarity needed to determine the usefulness of this instrument.

3.3.2 Innovative contractual mechanisms

Another option involves using other innovative contractual mechanisms to try to achieve asset segregation. These are hypothetical at this stage and require additional legal attention and analysis.

One option involves novel contractual terms between the MM firm and creditors. For example, the MM firm could include terms with creditors which require them to relinquish any potential claims against users' funds. Contracts with mobile money users could include a clause that the MM firm has entered into such agreements with creditors.[59]

Civil law countries seeking to use innovative contractual mechanisms will need to identify the legal pre-requisites required for such arrangements to work. Such contracts will need to be consistent with contracts, insolvency, and other areas of law. Additional research is required on the form of such tools.

3.3.3 Insurance

Private or public insurance is another option for protecting users' funds. This option may be particularly attractive in jurisdictions in which implementing the other options discussed above, particularly a fiduciary, are not feasible due to legal or other constraints. Private or public insurance can protect users' funds by guaranteeing their availability. Private insurance would involve a firm or another type of private actor providing funds to an MM firm in institutional distress. Public insurance involves the state taking this role through, for example, deposit insurance schemes.

[55] For an overview across jurisdictions; Maurizio Lupoi, Trusts: A Comparative Study (Cambridge University Press, 2000); M. Cantin Cumyn, "Reflections Regarding the Diversity of Ways in Which the Trust Has Been Received or Adapted in Civil Law Countries" in Lionel Smith ed., Re-imagining the Trust: Trusts in Civil Law (Cambridge University Press, 2012).
[56] See Sergio Cámara Lapuente, supra note 33 at 195–8.
[57] See Code civil des Français, Article 2012.
[58] In jurisdictions such as France, regulatory provisions explicitly provide for the delineation of trust funds. See e.g. Code civil des Français, Article 2024.
[59] Hansmann & Mattei "The Functions of Trust Law: A Comparative Legal And Economic Analysis", p 9.

Private and public insurance does not feature widely in mobile money regulatory frameworks, however there are some exceptions. For example, Colombia covers mobile money funds under its public deposit insurance schemes.[60]

Several issues arise when implementing private or public insurance for mobile money. One is that an insurance scheme would not be cost-effective or suitable in markets with small numbers of mobile money. This is because Insurance companies need large numbers of clients to avoid the risk of having to make simultaneous payouts across all clients. Doing so would rapidly deplete its resources.[61]

Another is that the cost of insurance might impede financial inclusion goals.[62] This is because MM firms may pass on the cost of mandatory insurance to users. Doing so may make the service unaffordable for some users, particularly those from low-income communities.

Insurance may address loss of value risk but does not necessarily address illiquidity risk. This is because, depending on the legal arrangements between insurance and insolvency law, users may need to wait until the end of insolvency proceedings in order to access their funds. So this means that funds are available but users face a delay in receiving them.

Insurance could lead to moral hazard whereby MM firms have less incentive to adequately protect users' funds according to the rules outlined above. Policymakers may then need to introduce additional capital requirements to address moral hazard, much like in banking. The additional regulatory costs from such requirements may impede financial inclusion goals, as discussed above.

Finally, insurance may not be feasible in some jurisdictions due to lack of local capacity. This is because the insurer itself – whether a private or public actor – could itself enter financial distress when seeking to support the firm which is using this instrument. Regulation can address this problem by mandating that private insurance companies must pass certain liquidity and solvency tests before they can serve mobile money users. Public insurance bodies, such as government deposit insurance agencies, would need to carefully consider whether they have sufficient funds and administrative ability to extend their support to mobile money schemes.

4. PORTFOLIO REQUIREMENTS

Many countries seek to address liquidity risks by imposing portfolio rules. Portfolio restrictions impose limits on the type of assets in which MM firms can invest customer funds.[63] Usually these assets take the form of low risk, highly liquid securities.

[60] Izaguirre, Juan Carlos, Claire McGuire, and David Grace. 2015. Deposit Insurance and Digital Financial Inclusion. CGAP Blog post. Washington, DC: CGAP.

[61] Ramos Muñoz, David and Solana, Javier and Buckley, Ross P. and Greenacre, Jonathan, Protecting Mobile Money Customer Funds in Civil Law Jurisdictions (December 21, 2015). Global Economic Governance Programme Working Paper 2015/102, UNSW Law Research Paper No. 2015-79.

[62] Usually financial inclusion focuses on providing a range of financial services to unbanked communities, such as payment, storage, insurance, and credit. United Nations Secretary-General's Special Advocate for Inclusive Finance for Development, 'Financial Inclusion' (UNSGSA, 2015) <http://www.unsgsa.org/about/financial-inclusion> accessed 29 September 2015; see similar definitions from Centre for Financial Inclusion, 'Financial Inclusion Glossary' (Centre for Financial Inclusion, 2015) <http://www.centerforfinancialinclusion.org/publications-a-resources/financial-inclusion-glossary> accessed 29 September 2015. And See Basel Committee on Banking Supervision, 'Range of Practice in the Regulation and Supervision of Institutions Relevant to Financial Inclusion' (2015) Bank for International Settlements, January 2015, 3 <http://www.bis.org/bcbs/publ/d310.pdf> accessed 20 April 2016.

[63] Awrey and van Zwieten.

Initially, portfolio arrangements focused on storing funds in a bank which appear to have been based on the assumption that that doing so protects such funds from liquidity risk. Presumably, this is due to the view that bank regulation can protect such funds from loss.

However, as discussed in Section 1, this assumption may be misplaced; key protections of users' funds, which often take the form of storing funds in a bank account, provide no protection against the failure of the bank or banks holding the account. This is because the bank accounts are used like any other deposit to fund the bank's operations. There are no dedicated assets funded by the accounts. There is also no custodian relationship whereby the bank would hold specific assets on behalf of funds in the account.

Bank failure would not directly affect the MM firm platform, however freezing of the balances while the failed bank was resolved, and potential loss of some or all of the balances, would jeopardize the 1:1 relationship. This would, in turn, breach regulations to maintain the 1:1 relationship, as discussed above.

Several issues arise in a number of countries using mobile money. These are explored below.

4.1 Little or no diversification requirements: recommendation - advise countries on the benefits of diversifying how users' funds are stored and develop detailed research into the benefits and costs of various additional options.

Certain countries have no or little diversification requirements, usually simply requiring that funds be stored within a single custodian bank.[64] This means users' funds are fully exposed to risk of failure of the bank(s) in which funds are stored.

A policymaker could consider widening diversification requirements, which involves two sets of issues, one of which is the extent of diversification it will actually impose in practice, ie the range of assets in which the MM firm must store users' funds. The policymaker could require an MM firm to store all of funds in a narrow set of assets, such as bank accounts. Another approach involves requiring extensive diversification, potentially storing a portion of funds across a range of assets such as bank deposits, securities, treasury bills and/or bonds. Wider diversification will reduce concentration risk that applies in any one asset class. [65] However, diversifying more widely also introduces operational challenges, because the MM firm, banks, and/or policymaker must try to reconcile the account in which funds are stored with accounts provided by a range of financial intermediaries. Also, it is unclear how losses would be shared amongst users in the event that one or more of the asset classes faces a liquidity or credit problem.

A second issue involves considering the benefits and costs of individual asset classes in which funds should be stored, one of which could be government securities. Keeping users' funds in government securities would virtually eliminate the storage account's exposure to bank failure. The cost is that banks' intermediation function would be impacted. There may not be sufficient supply of government securities in this situation. Furthermore, investments in government securities would involve taking on certain credit and liquidity risks.

[64] See, for example Nigeria's requirements, namely that all funds must be stored with a settlement account held with a bank: Guidelines on Mobile Money Services in Nigeria, Clause 7.3(g)) and 7.4(f).
[65] The benefits of wide diversification: Markowitz H, 'Portfolio Selection' (March 1952) The Journal of Finance 7 (1): 77–91.

Another potential asset class is permitting or requiring MM firms to store funds – or a portion of funds – in a central bank account. This approach is used in Colombia and El Salvador.[66]

An account with a central bank could be safer than a commercial bank account, but funds will be exposed to inflation, foreign exchange and other risks and there may be less intermediation. This is because less funds will move into the banking system whereby they can be intermediated into the economy.

Furthermore, storing funds in a central bank account would change the role of mobile money in the economy, particularly making it substitute the bank-based payment system for small-scale transactions and so requires careful consideration. This is because it would enable mobile money to provide small-scale deposit services without any interaction with the banking system. This is likely to make mobile money particularly safe – at least from risks from the banking system – but also means that depositors may move more of their funds from the banking system into mobile money. In turn this might mean less funds intermediated into the economy. In addition, usually funds need to be diversified across a very large number of assets in order to achieve any meaningful reduction in risk from any one class.[67]

Finally, and another related option involves diversification still further into other types of bonds. This could include enabling or requiring MM firms to store funds - or a portion of funds - in company and/or government bonds. This approach is used in countries in the West African Economic and Monetary Union.[68]

The international community should then communicate the benefits and cost of these different asset classes to domestic policymakers. This could involve a series of training and workshops to policymakers, informing them about different methods of storing users' funds.

4.2 Potential problems reconciling e-float with accounts in bank deposits– provisional recommendation: implement reconciliation strategies such as automated monitoring

It is unclear how MM firms actually diversify in practice, including whether they comply with regulatory requirements (if of course, such requirements exist). There is an assumption that MM firms comply with diversification rules and appears to be limited additional oversight about whether this occurs in practice.

The potential fix to this problem could involve better supervisory technology, such as sup tech. Doing so can better ensure that MM firms comply with diversification rules in practice.

Even if diversification takes place, this tool provides only partial protection of users' funds and raises several challenges, one of which is lack of clarity about users' entitlement to individual accounts stored within the banking system. For example, the pooled nature of the account combined with diversification of funds means a policymaker may find it difficult identifying the individual beneficiaries of those funds in the event of bank failure. This is because MM firms do

[66] El Salvador Ley para Facilitar la Inclusion Financiera (undated), Article 10.
[67] Markowitz H, 'Portfolio Selection' (March 1952) The Journal of Finance 7 (1): 77–91.
[68] These countries include: Benin, Bolivia, Burkina Faso, Cote d'Ivoire, Guinea-Bissau, the Philippines, Mali, Niger, Senegal, and Togo: BCEAO Instruction regarding Mobile money Issuance, Art. 33-34 and Circular 649.

not allocate specific subscriber balances to individual banks. Instead, banks treat the account as one pooled account, making it unclear which individual beneficiaries are impacted by failure of a bank, what mobile money accounts are above the deposit insurance limit, and which beneficiaries ultimately need to be compensated.

A policymaker can explore a number of options to address the potential reconciliation problems that arise through intermediation, one of which involves identifying certain subscriber balances in proportion to the amount of total balances held by the failed bank or other type of financial intermediation. So in the event of failure of a bank holding 30% of balances, all mobile money account holders will lose 30% of their funds. There are a number of challenges with this approach. It may reduce trust in mobile money, cause loss to users and a sense of unfairness amongst users given they do not get the chance to choose where funds are stored.

A policymaker may also permit users to choose which bank or other financial intermediary in which her funds will be stored. This approach gives users more choice which may reduce the potential sense of unfairness in the event of bank failure and subsequent losses discussed directly above. However, it is unlikely that users will have the information and/or incentive to study, in depth, the options available for the storage of their funds. Furthermore, the complete range of asset classes might be unavailable to newer users; for example, a bank may be full with balances and unable to accept any more funds from the public.

Regardless of how users' funds are stored across banks, a policymaker needs a method of identifying where individual users' money is held, which could require an automated, technical solution monitored daily. Such a solution may be less onerous than it appears. This is because it simply requires a reconciliation of total amounts, not necessarily a flow of transactions in the economy.

4.3 Limitations with banking regulation, including pass-through deposit insurance – preliminary proposal: consider different insurance options

The diversification rules do not address the issue discussed above, namely that MM firms do not enjoy the protection of bank regulation to the same extent as regular non-mobile money depositors. However, this is addressed, at least in part and in theory, through pass through deposit insurance, discussed below.

Furthermore in many developing countries, existing contingency plans for banks appear to have significant shortcomings, raising questions about the ability to quickly resolve a bank or MM firm with minimal disruption. Kenya is an appropriate example. The Kenya Deposit Insurance Corporation is Kenya's resolution authority which must be appointed by the Central Bank of Kenya (CBK).[69] The KDIC Act provides receivership powers paralleling those in the Bankruptcy Act. It is not clear whether these are consistent with the provisions prescribed by the Financial Stability Board's Key Attributes of Effective Resolution Regime for Financial Institutions.

The recent history of bank failures in some developing countries and limitations with general insolvency regime suggests that bank assets – including users' funds - could be frozen for an

[69] The KDI Act (Part VI) establishes KDIC as the resolution authority, with the CBK required to appoint KDIC as receiver.

extended period. For example, banks have failed on occasion in Kenya, including the collapse of three large banks in 2015-2016; Dubai Bank, Imperial Bank and Chase Bank.[70] In response, the Kenyan Deposit Insurance Corporation has explicit power to participate in lesser cost resolutions such as purchase and assumption transactions (transfer and exclusion in the terminology of the Kenyan legislation).[71]

Limitations with contingency plans for banks mean it is unclear whether policymakers have the express legal power needed to transfer funds from a failed MM firm and/or bank to another actor. This is a significant limitation given it appears that policymakers assume that funds can be transferred in this way.

Some countries such as Nigeria and Kenya have, at least legally, extended pass-through deposit insurance to mobile money. In this situation, the deposit insurer acknowledges that the MM firm's bank account can be characterised as a number of smaller accounts for the purposes of deposit insurance protection. In effect this means each mobile money account receives the full protection of the country's deposit insurance scheme. Kenya specifically provides for this protection, meaning the amount held by an individual in each mobile money e-wallet would be covered up to the deposit insurance limit, in addition to deposit insurance coverage applicable to any other deposits held by the individual at that bank.[72]

A potential challenge however is that it is not clear how pass-through deposit insurance is to be operationalised and ultimately whether it would be effective if required. There are no publicly-available contingency plans or crisis management arrangements to operationalize this deposit insurance coverage. This makes it difficult to know whether to rely upon this instrument. Challenges could involve determining total balances (money plus other deposits) held by an individual, allocating individual balances to specific banks, and determining how to actually pay out mobile money users when a bank is liquidated.

A policymaker could also consider insurance options, one of which involves applying deposit insurance directly to funds stored with MM firms. This approach has been taken in Colombia, India, and Mexico.[73] Deposit insurance may require additional prudential regulation of MM firms in order to address moral hazard problems.[74]

Pass through deposit insurance and regular deposit insurance bring a range of benefits and costs that require consideration. Such instruments appear to bring consumer protection by providing a state guarantee for funds. Such a guarantee may also contribute to financial inclusion goals by encouraging unbanked people to trust the system. However, insurance comes with a set of important potential consequences, including the possible migration of depositors into mobile money and increased compliance costs on MM firms which can impede financial inclusion goals.

[70] See discussion in http://www.ijmbs.com/Vol7/73/1-robert-n-gathaiya.pdf.
[71] The KDIC Amendment Act 2013 amends section 50 of the KDIC Act to permit the fund to be used for lesser cost resolutions, thus providing explicit power to facilitate purchase and assumption transactions (called exclusion and transfer in the Kenyan legislation) that could transfer the MM firm trust business to another bank.
[72] The KDIC Act Article 29(10(c) provides that a deposit held in trust for a beneficiary shall be deemed to be a deposit separate from any other deposit held at that bank by the beneficiary, and also separate from any other deposit held in trust by another beneficiary. The Kenya Deposit Insurance Regulations, 2015, provide "derived" protection whereby each individual beneficiary of a trust account is covered to the deposit insurance limit (Section 10).
[73] Juan Carlos Izaguirre (CGAP), 'Deposit Insurance and Digital Financial Inclusion' (2016).
[74] See a discussion of this approach in Juan Carlos Izaguirre (CGAP), 'Deposit Insurance for Digital Financial Products: 3 Approaches' (2015).

Compliance costs can increase because such firms must comply with several ex post regulatory requirements in order to obtain pass through deposit insurance, such as obtaining fidelity bond insurance.

Yet another option involves third party insurance: a party is contractually obligated to provide users with liquidity in the event of institutional distress of an MM firm, which is used by Safaricom.[75] Safaricom has purchased insurance coverage from a Lloyds syndicate covering trust balance in banks up to a required specified level. There are potential challenges with this approach, such as there may be insufficient capacity for private insurance for mobile money in Kenya and other countries. Costing may be another challenge. The interest payments earned through the trust could be paid on the premium of private insurance. In theory such an approach appears valid given the expenditure would benefit the individual account holders, namely by protecting their balances against failure of a bank.

A related option involves ring-fencing the balances or establishing a priority claim in the liquidation of a bank but the legal effect and operationalising such provision is unclear. For example, ring fencing could take the form of requiring banks to hold specific assets, such as government securities, for users. However, there may not be sufficient government securities and banks face disintermediation. A priority claim could mean that balances and related assets would be transferred to another bank in the event of failure. This approach – and the priority it brings – may cause controversy because other depositors could argue that their circumstances also warrant a priority claim status. Like mobile money, other depositors could claim they store 'important' funds that require protection, such as pension funds and insurance funds. funds that require protection, such as pension funds and insurance funds.

These legal protections, particularly a priority claim for trust deposits, may impede the role of mobile money in the economy as a retail payment system. This is because the added protection may encourage people to leave large balances in the mobile money system rather than push them to a bank account. This may mean that savings may move into the mobile money sector, meaning the service takes a role close to the banking system, which may not be what a policymaker desires.

There may also need to be amendments to the way in which supervisors determine a banks' liquidity risk and assess its liquidity risk management practices and continency plans. This may need to involve ensuring balances are explicitly considered in this process.

5. CRISIS MANAGEMENT PLANS

A potentially serious problem across countries is the lack of crisis management plans for collapse of mobile money firms. There appears no dedicated plans for institutional distress at mobile money firms, nor the bank(s) in which funds are stored.

[75] Awrey and van Zwieten, note 2 at 46.

Crisis management plans may be appropriate if collapse of mobile money creates a form of systemic risk. By analogy, crisis management tools are imposed on banks partly to address potential systemic risk that can arise through their failure.[76]

This leads to a key question: what does systemic risk look like in mobile money sectors? This question tends to be unexplored because few people forecast the rapid growth of mobile money to the point that it may have systemic consequences.[77] Furthermore, many international standards on systemic risk tend to assume that banks underpin payment systems, not non-banking payment services, such as mobile money.[78]

We need a type of stress test enabling us to perform a 'what if' - predicting the effect of a shock on an MM firm, users' funds stored within it, and potential impact on the surrounding mobile money and wider financial systems. A better understanding of likely consequences of failure can help us design appropriate rules. Such rules can focus on individual firms (so-called 'micro prudential' regulation often applied to banks) and the system as a whole (so called 'macro-prudential' regulation).[79]

Such tools are applied on banks but have yet to be adapted to mobile money. Certain stress tests focus on individual banks, normally carried out by banks themselves or supervisors. Central banks and/or supervisory agencies also perform systemwide stress tests.[80]

This section provides new thinking for mobile money stress tests by claiming that realization of loss of value risk may cause significant economic damage to lower-income communities that have stored a substantial portion of their wealth within the service. However, it is unlikely to significantly damage the surrounding economy. In contrast, illiquidity risk from failure of a MM firm may disrupt a large number of transactions in the economy which could cause significant economic disruption. The discussion analyses M-Pesa in Kenya and notes that future research projects can take these initial findings much further.

5.1 Loss of Value Risk

Realization of loss of value risk (loss of users' funds to third party creditors of the MM firm) may cause significant economic damage to individual lower-income users, but is unlikely to

[76] Awrey and van Zwieten.
[77] See Michael Joseph, Reflections on The Technological Development and Subsequent Impact of the World's Leading Mobile Money Service, WORLD BANK BLOGS (2017). Nick Hughes and Susie Lonie, Launching M-Pesa (2011), 67. For a notable exception, see John Armour and Dan Awrey (2015) claim that a lack of analysis of the potential systemic consequences of collapse of MM firms is a potentially important 'lacuna' given the size of the service in many countries in which it operates. John Armour and Daniel Awrey, Prioritizing the Implementation of International Financial Regulation (The Commonwealth, Economic Papers Series, 2015). Concerns have been raised that mobile money may increase the velocity of payments in the money transfer system (see Klein and Mayer (n 58) 12). The initial research on this topic suggests mobile money does not increase such velocity substantively and so is unlikely to have macro-economic effects and inflation: see Janine Aron and John Muellbauer, 'Does Mobile Money Cause Inflation? Evidence from Inflation Models for Uganda: A Policy Brief' (2015) Said Business School, Oxford University <http://www.sbs.ox.ac.uk/sites/default/files/research-projects/mobile-money/Mobile-money-inflation-30April.pdf> accessed 8 April 2016; Janine Aron, John Muellbauer, and Rachel Sebudde, 'Inflation Forecasting Models for Uganda: is Mobile Money Relevant?' (2015) Said Business School, Oxford University <http://www.sbs.ox.ac.uk/sites/default/files/research-projects/mobile-money/inflation-forecasting-16April.pdf> accessed 8 April 2016. These scholars also argue that such firms should be treated as systemically important financial institutions.
[78] For example, the BIS principles define payment systems 'as the means by which funds are transferred among banks': Bank for International Settlements, 'Core Principles of Systemically Important Payment Systems' (January 2001) Bank for International Settlements, Sections 1.1 and 3.0.1 <http://www.bis.org/cpmi/publ/d43.pdf> accessed 8 April 2016.
[79] Baudino, Patrizia, et al. Stress-Testing Banks a Comparative Analysis. 2018. Open WorldCat, https://www.bis.org/fsi/publ/insights12.pdf.
[80] Ibid.

significantly damage the entire economy. A lower-income person may store the majority of her wealth within her mobile money account. She may then lose much of her economic well-being should the MM firm collapse. However, usually mobile money storage caps means more wealthy members of the public can only store a small portion of their wealth in the service. They will need to find alternative instruments in which to store the majority of their wealth, such as bank deposits. This suggests that the overwhelming majority of wealth in a country is likely to be stored outside of mobile money, probably in the banking system.

M-Pesa in 2013 provides a useful example of the effect of storage caps in limiting the amount of wealth held in mobile money. As discussed above, originally a significant portion of M-Pesa users were unbanked and otherwise of low-income background, suggesting they may lose a non-trivial component of their wealth through loss of value risk.[81] However, M-Pesa funds stored in Kenyan banks comprised around 0.4% of Kenya's depositor base, suggesting the overwhelming majority of the country's wealth was stored in other assets, probably the banking system.[82] This data is 6 years out of date and it is conceivable that M-Pesa and potentially other mobile money schemes now store a much greater proportion of wealth in the Kenyan economy.

5.2 Illiquidity Risk

Realization of illiquidity risk (a delay in returning users' funds) may significantly damage a country's economy by halting payment transactions. By illustration, in 2018, M-Pesa processed 16 million transactions every day in Kenya.[83] Without effective regulatory frameworks, collapse of Safaricom would halt these transactions until insolvency proceedings are complete. This process may take several years given that the average time for completion of a bankruptcy procedure in Kenya is 4.5 years, as discussed above.[84] M-Pesa users, comprising the vast majority of Kenya's population, would be unable to make payments when due, obtain funds from family members to manage risk, and otherwise transact in the formal and informal sectors.

The growth of mobile money schemes in other countries means collapse of this service could damage jurisdictions beyond Kenya. For example, in 2019, there were 59 million mobile money accounts in Bangladesh out of a population of 164.7 million.[85] As of September 2018, there were almost 24 million mobile money accounts in Uganda processing almost 200,000 transactions per

[81] In 2010 around 50% of M-Pesa's users were unbanked: see William Jack and Tavneet Suri, 'The Economics of M-Pesa: An Update', (2010) Massachusetts Institute of Technology, Working Paper, October 2010 <http://www.mit.edu/~tavneet/M-PESA_Update.pdf> accessed 28 June 2016.

[82] This is an approximation based on the following figures. In September 2013, Safaricom held 725,944,000,000 KSH in depositors from its M-Pesa service (see Safaricom 'M-Pesa Statistics' (Safaricom, undated) < http://www.safaricom.co.ke/personal/tools/m-pesa-tools/m-pesa-statistics> accessed 9 April 2016). In March 2013: Kenya's total depositor base was 1.8 trillion. See Central Bank, 'Kenyan Banking Sector Registers Improve Performance' (Central Bank of Kenya, 31 March 2013) <https://www.centralbank.go.ke/index.php/news/296-kenyan-banking-sector-registers-improved-performance> accessed 9 April 2016. Dividing Safaricom's deposits by Kenya's total depositor base comes to around 0.4%. See the discussion on the CBA below.

[83] "Zimbabwe and Kenya Lead the Way in Africa's Dash from Cash." The Guardian, 22 Feb. 2018, http://www.theguardian.com/world/2018/feb/22/kenya-leads-way-mobile-money-africa-shifts-towards-cash-free-living.

[84] "Explore Economies. - Kenya" World Bank, https://www.doingbusiness.org/en/data/exploreeconomies. Accessed 24 Aug. 2020.

[85] Usage also requires consideration: 52% of Bangladeshi mobile money accounts are considered 'active': IMF, 'Financial Access Survey,' <https://data.imf.org/?sk=E5DCAB7E-A5CA-4892-A6EA-598B5463A34C&sId=1390030341854>.

day.[86] As of April 2019, there were 22.4 million mobile money accounts in Tanzania out of a population of 58 million.[87]

There may also be significant follow-on effects of illiquidity risk for the informal economy. Disruption to mobile money may mean people cannot make transactions to counterparties with actors in the informal economy. Disruptions to those transactions may cause significant damage to the economy. This is because in many developing countries the informal economy comprises a significant portion of overall economic activity – often between 40-70%.[88].

We then need a criteria for determining the potential consequences of illiquidity risk on an economy. We can borrow components of this criteria from international standards issued by the International Monetary Fund, Bank for International Settlements, Financial Stability Board, [89] the United Kingdom's Independent Commission on Banking (2011),[90] wider literature on the regulation of financial institutions and markets, and development economics.[91] Future research needs to develop this criteria in greater depth.

While future research is required on this topic, there appears at least a prima facie case for exploring crisis management tools, particularly those which can address illiquidity risk.

6. CONCLUSION AND NEXT STEPS

This report has emphasized that we need new thinking for the regulation of mobile money because of the newness of the service. We are still determining the precise risks to users and surrounding economies from collapse of a mobile money scheme and regulatory tools that can address them.

Table 1 in the Introduction of this document provides a useful starting point for regulators wishing to further support the regulation of mobile money in their jurisdictions.

[86] Source: Bank of Uganda, Mobile Money Statistics. https://www.bou.or.ug/bou/bou-downloads/payment_systems/Mobile-Payment-Analysis.pdf.
[87] Bank of Tanzania, 'Monetary Policy Statement,' (June 2019), <https://www.bot.go.tz/Publications/MonetaryPolicyStatements/MPS%20ENG%20June%202019.pdf>, p. ix.
[88] For example, in a World Bank report Laoyza, Serven and Sugawara (2009) estimate the informal economy in Latin America produces 40% of the GDP and employs 70% of the labor force informally : Norman V. Loayza, Luis Servén and Naotaka Sugawara, 'Informality in Latin America and the Caribbean' (2009) The World Bank Development Research Group Macroeconomics and Growth Team, Policy Research Working Paper 4888, March 2009 <http://library1.nida.ac.th/worldbankf/fulltext/wps04888.pdf> accessed 29 December 2016. Other studies, such as La Porta and Schleifer (2008) emphasise the size of the informal economy may be around 29% to 57.3% compared to the overall economy: Rafael La Porta and Andrei Shleifer, 'The Unofficial Economy and Economic Development' (2008) Brookings Papers on Economic Activity, Fall 2008, 275 <https://www.brookings.edu/wp-content/uploads/2008/09/2008b_bpea_laporta.pdf> accessed 28 December 2016, 2. However, these scholars also note the difficulties of measuring the informal economy given the prevalence of hidden firms and outputs. These may be hidden from police, tax authorities and regulators, to minimise tax and potentially for other reasons: 5.
[89] See also IMF, BIS, FSB, 2009, Guidance to Assess the Systemic Importance of Financial Institutions, Markets and Instruments: Initial Considerations, Report to the G-20 Finance Ministers and Central Bank Governors.
[90] See Independent Commission on Banking ('ICB'), Final Report: Recommendations (London: ICB, 2011) ('ICB Report'); <http://webarchive.nationalarchives.gov.uk/20131003105424/https:/hmt-sanctions.s3.amazonaws.com/ICB%20final%20report/ICB%2520Final%2520Report[1].pdf>.
[91] Armour et al, see above.