

# The Shadow Payment System

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Banking, derivatives, and structured finance may attract the lion's share of accolades and approbation in global finance—but payment systems are where the money is. Historically, payment systems in most jurisdictions have been legally and operationally intertwined with the conventional banking system. The stability of these systems has thus benefited from the unique prudential regulatory regimes imposed on deposit-taking banks. These regimes include deposit guarantee schemes, emergence liquidity assistance or 'lender of last resort' facilities, and special bankruptcy or 'resolution' processes for failing banks. These regimes have the practical effect of relaxing the strict application of corporate bankruptcy law, thereby enabling banks—and the payment systems embedded within them—to continue to perform their core payment and other functions under conditions of severe institutional stress.

Recent years have witnessed the emergence of a vibrant, diverse, and rapidly growing *shadow* payment system. This system includes peer-to-peer payment systems such as PayPal, mobile money platforms such as M-Pesa, and crypto-currency exchanges such as Mt. Gox. The defining feature of this shadow payment system is that the financial institutions that populate it perform the same core payment functions as banks, but without benefiting from the prudential regulatory regimes that ensure bank-based payment systems can continue to function during periods of institutional stress free from the substantive and procedural constraints imposed by general corporate bankruptcy law. This paper examines the risks that the legal treatment of the shadow payment system poses to both customers and broader financial and economic stability, along with the likely effectiveness of various strategies that might be employed to address these risks.

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## 1. INTRODUCTION

Banking, derivatives, and structured finance may attract the lion’s share of accolades and approbation in global finance—but payment systems are where the money is. Effective payment systems are vital to the smooth and efficient operation of the modern economy. Whenever your employer deposits your salary into your bank account, whenever you use your debit or credit card to purchase goods or services, and whenever you write a cheque to your landlord or to pay a bill, you are invariably relying on one or more payment systems to complete the transaction. Collectively, these payment systems facilitate over \$USD400 *trillion* in non-cash transactions per year: roughly five times global gross domestic product.<sup>1</sup> Accordingly, while we often take for granted the important functions that payment systems perform within the global financial and economic system, there are few parts of this system that have a more direct impact on our daily lives.

Historically, payment systems in most jurisdictions have been legally and operationally intertwined with the conventional banking system. Banks accept deposits from households and firms in exchange for a promise to pay back deposited savings, along with any accrued interest, on demand. These deposits are credited to accounts that serve as the backbone of a complex institutional architecture that facilitates non-cash payments among and between households, firms, and governments. This architecture typically includes a network of correspondent accounts that banks hold with one another, along with one or more interbank clearing and settlement systems. Residing at the apex of this architecture is then a central bank such as the Federal Reserve, Bank of England, or European Central Bank that issues the ultimate settlement asset, oversees

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<sup>1</sup> See Boston Consulting Group, *Global Payments 2014: Capturing the Next Level of Value* (September 2014) at 5, available at <http://www.gcgperspectives.com> (estimating global payment volumes for 2013 at \$USD410 trillion, excluding payments facilitated by non-bank intermediaries and payment systems). For a country-by-country breakdown of payment statistics in larger developed countries, see Committee on Payments and Market Infrastructures (CPMI), *Statistics on Payment, Clearing and Settlement Systems in CPMI Countries – Figures for 2015* (December 2016), available at <https://www.bis.org/cpmi/publ/d155.htm>.

the functioning of the payment system and, importantly, stands ready to provide liquidity during periods of institutional or systemic stress.

The defining feature of banks is that they invest deposited savings in loans, commercial and residential mortgages, and other longer term investments.<sup>2</sup> The resulting mismatch between their short-term liquid liabilities (demand and other deposits) and longer term and potentially illiquid assets (loans and mortgages) renders banks susceptible to destabilizing runs by depositors and other short-term creditors.<sup>3</sup> In order to minimize the risk of runs—along with the risk that these runs might escalate into more widespread financial panic—banks are subject to highly specialized prudential regulatory regimes.<sup>4</sup> These regimes typically include deposit guarantee schemes, emergency liquidity assistance or ‘lender of last resort’ facilities, and special bankruptcy or ‘resolution’ processes for failing banks. Importantly, these regimes have the practical effect of relaxing the strict application of general corporate bankruptcy laws that apply to virtually all other types of distressed firms, thereby enabling banks—and the payment systems embedded within them—to continue to perform their vital payment, investment, and other functions under conditions of severe institutional stress. To address the resulting moral hazard problems, banks are then subject to intensive prudential supervision and capital, liquidity, and other regulatory requirements designed to constrain socially excessive risk-taking.<sup>5</sup>

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<sup>2</sup> This is reflected in the legal definition of a ‘bank’ in most jurisdictions. In the European Union, for example, a “credit institution [bank] means an undertaking the business of which is to *take deposits* or other payable funds from the public and to *grant credits for its own account...*” [emphasis added]; see Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012, art. 4.1(1). There are several definitions of a ‘bank’ under U.S. law. Pursuant to section 2(c) of the *US Bank Holding Company Act of 1965*, 12 U.S.C. § 1841, for example, a bank is defined as “an institution organized under the laws of the United States... which both – (i) *accepts demand deposits* that the depositor may withdraw by check or similar means for payment to third parties or others; and (ii) *is engaged in the business of making commercial loans.*” [emphasis added]. At the same time, of course, this conventional narrative of financial intermediation—pursuant to which banks fund loans through deposit liabilities—is at best incomplete (if not somewhat inaccurate) insofar as many deposits are actually created through the extension of loans by banks to firms and households; see Robert Hockett and Saule Omarova, “The Finance Franchise” (2017), 102 *Cornell Law Review* [forthcoming] at 7-10 (delineating between the ‘credit-intermediation’, ‘credit-multiplication’, and ‘credit-creation’ models of finance).

<sup>3</sup> See Douglas Diamond and Philip Dybvig, “Bank Runs, Deposit Insurance, and Liquidity” (1983), 91:3 *Journal of Political Economy* 401. For a recent survey of the literature on the fragility of banks, see Franklin Allen, Elena Carletti, Itay Goldstein, Agnese Leonello, “Moral Hazard and Government Guarantees in the Banking Industry” (2015), 1:1 *Journal of Financial Regulation* 30. For a description of how banks can be vulnerable to runs by short-term creditors other than depositors, see Gary Gorton and Andrew Metrick, “Securitized Banking and the Run on Repo” (2012), 104:3 *Journal of Financial Economics* 425.

<sup>4</sup> These regulatory regimes are described in greater detail in Part 4.

<sup>5</sup> At the international level, the development of these prudential standards takes place under the auspices of the Basel Committee on Banking Supervision (BCBS); see for example, BCBS, “Basel III: A Global

Technological innovation is rapidly changing the way we make payments. To see how, you need only go to a grocery store, use public transit, or sell your old sofa on eBay. Perhaps most importantly, while banks and bank-based payment systems still dominate the financial landscape in most jurisdictions, recent years have witnessed the emergence of a vibrant, diverse, and rapidly growing *shadow* payment system. This shadow payment system includes peer-to-peer (P2P) payment systems such as PayPal, mobile money platforms such as Kenya’s M-Pesa, and crypto-currency exchanges such as Mt. Gox.<sup>6</sup> Despite this diversity, the financial institutions that populate the shadow payment system share two core features. First, these institutions perform the same core payment functions as conventional deposit-taking banks: combining the acceptance of funds<sup>7</sup> (*storage*) with the promise to transfer<sup>8</sup> or convert these funds on demand (*liquidity*).<sup>9</sup>

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Regulatory Framework for More Resilient Banks and Banking Systems” (June 2011), available at [www.bis.org/publ/bcbs189.pdf](http://www.bis.org/publ/bcbs189.pdf) and BCBS, “International Convergence of Capital Measurement and Capital Standards: A Revised Framework Comprehensive Version” (June 2006), available at <http://www.bis.org/publ/bcbs128.pdf>. For a more detailed overview of these requirements, see John Armour, Dan Awrey, Paul Davies, Luca Enriques, Jeff Gordon, and Jennifer Payne, *Principles of Financial Regulation* (Oxford University Press, Oxford, 2016), chapter 14-17.

<sup>6</sup> This list is not intended to be exhaustive. There are many other elements of the shadow payment system and new institutions and business models are emerging at a rapid pace. Given the differences between the business models used in the shadow payment system, there are clearly a range of taxonomies that could be used to organize or categorize system providers. These differences in business models will be important insofar as they have a bearing on the desirability of the strategies that may be used to enhance the credibility of a payment system provider’s commitment to provide storage and liquidity. For the purposes of this paper, however, it is not necessary to do more than note that the providers that we survey all perform the same core payment functions (see Part 2), and it is this common feature that attracts our interest.

<sup>7</sup> The nature of these ‘funds’ varies across the payment systems we survey. They may be legal tender, currency, or other ‘base’ money issued by central banks, demand and other short-term deposits held with conventional banks, or other privately-issued assets that are used as effective substitutes for base money and/or bank deposits (e.g. crypto-currencies). For the purposes of this paper, we refer to all of these assets as ‘funds’ while acknowledging their diverse characteristics.

<sup>8</sup> The mechanics of any ‘transfer’ will again vary across payment systems. These differences reflect the variation in the nature of the funds being deposited, the terms of the relationship between customers and the system provider, and in the law that governs these terms. In some systems, customers will be able to effect a transfer by assigning their claim to the return of the funds they have deposited to a third party, thereby effecting payment to that third party (see n 160 below). In other systems, transfers may have to take effect through the system provider, for example by the customer instructing the provider to debit the customer’s account (or ‘wallet’) and to take steps to credit (or enable another system provider to credit) a transferee with a claim of equivalent value, such that in legal terms there is not strictly a ‘transfer’ but instead the extinction of one claim and the creation of one or more new ones; see analogously Charles Proctor, *Mann on the Legal Aspects of Money*, 7<sup>th</sup> ed. (Oxford University Press, Oxford, 2012) at [7.18] on bank transfers. For the purposes of this paper nothing turns on these differences, except to the extent that they have a bearing on the question of whether claim holders have any proprietary interest in funds held by the payment system provider, or merely hold an unsecured claim to the payment of funds.

<sup>9</sup> The core payment functions of bank-based and shadow payment systems are examined in greater detail in Part 2.

Second, these institutions reside outside the perimeter of the regulated banking system.<sup>10</sup> As a result, these institutions do not directly benefit from the prudential regulatory regimes that ensure that bank-based payment systems can continue to function during periods of institutional stress. Accordingly, while these institutions may seem like potentially promising substitutes for bank-based payment systems, the conditions under which they can credibly commit to simultaneously provide their customers with both storage and liquidity will often be constrained by the strict application of substantive and procedural rules of general corporate bankruptcy law.

The rapid changes in the way we make payments have significantly outpaced our understanding of the potential risks stemming from the emergence and growth of the shadow payment system. This paper seeks to make up this lost ground by identifying and examining the risks that the shadow payment system poses to customers, along with those it may in future pose to financial and economic stability. As we shall see, these risks are a product of the fundamental disconnect between the shadow payment system's core storage and liquidity functions and its current legal and regulatory treatment in many jurisdictions. Just because we don't call something a 'duck' doesn't mean we should immediately eliminate the possibility that it might quack.

The risks that the shadow payment system poses to customers flow principally from the prospect of delayed conversion or transfer of funds (*illiquidity*) and the potential write-down of these funds where they are characterised as unsecured liabilities in the context of any bankruptcy proceeding (*loss of value*). These risks were vividly illustrated by the failure of the crypto-currency exchange Mt. Gox, which filed for bankruptcy protection in the United States and Japan in early 2014 with over \$USD470 million in missing assets.<sup>11</sup> While some of these assets have reportedly since been located, customers will still likely be required to wait until the conclusion of the bankruptcy process before receiving repayment—a process that is likely to take several years. It is also highly likely that customers will ultimately receive only a small fraction of the funds they originally entrusted to Mt. Gox.

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<sup>10</sup> There are of course many 'alternative' payment systems that are authorized as banks in one or more jurisdictions (e.g. WorldPay). By definition, these systems do not qualify as 'shadow' payment systems as we have defined this term.

<sup>11</sup> The failure of Mt. Gox is chronicled in greater detail in Part 5.

The emergence of the shadow payment system also poses potentially significant risks to financial and economic stability. These risks flow from three principal sources. First, as a growing number of micro and small enterprises—from online merchants, to Kenyan coffee growers—come to rely on the shadow payment system as their primary means of making and receiving payments and managing their working capital, there is a corresponding risk that the failure of institutions within this system could jeopardize the liquidity and, ultimately, solvency of an important cross-section of firms within the real economy. Through this channel, institutional instability within the shadow payment system could have an adverse impact on economic growth and employment. Second, as the shadow payment system continues to grow and evolve, the pressure to generate profits may drive institutions to bundle payment functions with more conventional forms of financial intermediation: combining their promise of storage and liquidity to customers with investments in longer-term and potentially illiquid assets.<sup>12</sup> The resulting maturity and liquidity mismatches would raise the prospect of destabilizing runs by customers and other short-term creditors. Through this channel, correlated runs within the shadow payment system could lead to a contraction in the money supply, thereby driving a contraction in investment and economic growth. Finally, as an increasing proportion of funds become held by institutions outside the conventional banking system, this may undercut the ability of central banks to use existing monetary policy tools to manage the money supply in pursuit of price stability, financial stability, and other policy objectives.<sup>13</sup> At present, each of these potential systemic risks is somewhat speculative: the shadow payment system has simply not achieved the scale necessary to pose a clear and present danger to financial or economic stability. Nevertheless, identifying potential risks at this early stage can enhance our understanding of how best to approach the design and regulation of this increasingly important component of the financial system.

Having identified the risks stemming from the emergence of the shadow payment system, this paper goes on to examine a range of strategies for minimizing their harmful effects. Given the functional parallels, it might seem tempting to subject institutions within the shadow payment system to the same prudential regulatory regimes that are

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<sup>12</sup> As described in greater detail in Part 5, this trend can arguably already be observed in the case of PayPal and mobile money platforms.

<sup>13</sup> These tools, along with their use within the context of the conventional banking system, are described in greater detail in Part 5.

currently imposed on conventional deposit-taking banks. Ultimately, however, the diversity of business models within this system—combined with the absence of meaningful levels of financial intermediation in many cases—strongly suggests that a more nuanced approach is likely to yield deeper insights. Just because something quacks doesn't mean that we should necessarily call it a duck.

For this reason, our examination proceeds on the basis of first principles. The strategies we examine include portfolio restrictions, third party insurance, outsourcing the storage function to deposit-taking banks, and utilizing trusts to ring-fencing customer funds. As we shall see, these strategies are not without their potential merits. None of them, however, is likely to fully address the risks generated by the bundling of storage and liquidity functions outside the regulated banking system. Moreover, in choosing between these strategies, market participants and policymakers face important tradeoffs between consumer and systemic protection, financial innovation, and competition within the payment system. Accordingly, this paper also examines the effectiveness of a seemingly neglected strategy—the *structural separation* of payment functions from other business activities—as a way of minimizing the risks generated within the shadow payment system without undercutting its unique and potentially transformative benefits. Almost inevitably, however, even this strategy entails potentially significant tradeoffs in terms of the ability of the shadow payment system to serve as a platform for other types of socially useful financial intermediation.

This paper holds out a number of important and related insights. First, the ability of banks to simultaneously provide both storage and liquidity—especially during periods of institutional and systemic stress—is a function of the unique prudential regulatory regimes to which they are subject. Historically, the stability of bank-based payment systems has thus benefited from the regulatory regimes designed to ensure the stability of banks. Second, and as a corollary, the recent emergence of institutions that provide storage and liquidity outside the perimeter of the regulated banking system poses potentially significant risks to customers. While somewhat less immediate, the continued growth of the shadow payment system could also pose potential systemic risks. Third, while strategies exist that may serve to protect customers and reduce potential systemic risks, these strategies do not at present appear to be widely utilized within the shadow payment system. We should acknowledge, however, that it is often extremely difficult to obtain reliable information about the legal and other institutional features of these



systems. This suggests that much work remains to be done to construct a more accurate map of the shadow payment system. Finally, and more broadly, this paper highlights the important role of the law and legal institutions in supporting liquidity and stability within the financial system. Collectively, these insights provide us with a useful starting point for building a more effective and resilient shadow payment system.

It is also important to clarify from the outset some of the insights that this paper is *not* designed to yield. First and foremost, this paper does not examine whether the emergence and growth of the shadow payment system is socially desirable, or evaluate whether payment systems are in general better positioned within the perimeter of the regulated banking system or outside it. While these are undoubtedly important questions, we would expect the answers to be heavily dependent on the relevant business models, along with the patterns of financial development, quality of legal and regulatory regimes and institutions, and prevailing political systems within individual jurisdictions. What works in the United States may not work in Kenya and vice versa. Second, this paper does not provide policymakers with a detailed blueprint for how to design or regulate the shadow payment system. Rather, our objective is to identify potential policy alternatives that might be used to enhance the effectiveness and resilience of these systems, along with the potential tradeoffs.

This paper proceeds as follows. Part 2 begins by identifying the core functions of modern payment systems, focusing specifically on the combination of storage and liquidity offered by institutions within both the conventional banking and shadow payment systems. Part 2 also frames the fundamental legal and public policy challenge stemming from the simultaneous provision of storage and liquidity in the shadow of general corporate bankruptcy law. Part 3 traces the parallel origins of banking and payment systems in the United States, the United Kingdom, and Continental Europe, demonstrating that the historical development of payment systems in these jurisdictions has been legally and operationally intertwined with the development of banks. Bringing this historical analysis forward to the present day, Part 4 describes the core features of modern payment systems in these jurisdictions. These features include a network of commercial banks and interbank clearing and settlement systems subject to highly specialized prudential regulatory regimes, along with a central bank that stands ready to provide liquidity to these institutions during periods of institutional or broader systemic instability. Part 5 then turns its attention toward the emerging shadow payment system:

examining the business models of P2P payment systems, mobile money platforms, and crypto-currency exchanges, along with the risks stemming from the bundling of storage and liquidity functions outside the perimeter of the regulated banking system. Part 6 concludes by identifying and examining the likely effectiveness of various strategies that institutions within the shadow payment system currently—or might in the future—employ to address these risks.

## 2. THE CORE FUNCTIONS OF MODERN PAYMENT SYSTEMS

Payment systems can be defined as the institutional arrangements that facilitate the transfer of funds from debtors (payors) to creditors (payees) in satisfaction of financial obligations.<sup>14</sup> Broadly speaking, these institutional arrangements fall into one of two categories. The first category is comprised of *wholesale* payment systems that facilitate the flow of funds between banks and other financial institutions and, in some cases, between these institutions and their large commercial clients. The category of wholesale payment systems can be further broken down into large value—typically interbank—clearing and settlement systems, foreign currency, derivatives, and other clearing houses, and centralized securities depositories.<sup>15</sup> The second category is comprised of *retail* payment systems that facilitate the flow of funds among and between businesses, households, and governments. Retail payment systems include those facilitating the use of debit and credit cards, automated teller machine (ATM) networks, cheques, and electronic fund transfers. While conceptually distinct, wholesale and retail payment systems are often highly interconnected from an operational perspective. As described in greater detail in Part 4, one of the most common points at which the operations of these systems intersect is within the conventional banking system.

Payment systems are often held out as performing a number of important and socially useful economic functions. Professor Hal Scott, for example, has argued that effective retail payment systems exhibit several key features. These features include universality

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<sup>14</sup> Bruce Summers, “The Payment System in a Market Economy” in Bruce Summers (ed.), *The Payment System: Design, Management, and Supervision* (International Monetary Fund, 1994) at 1 (“The payment system, which consists of the set of rules, institutions, and technical mechanisms for the transfer of money...”); Mark Manning, Erlend Nier and Jochen Schanz (eds), *The Economics of Large-value Payments and Settlements*, OUP, New York, 2009) at 3 (“any organized arrangement for transferring value between parties can be defined as a payment system”), and Andrew Haldane, Stephen Millard, and Victoria Saporta (eds.), *The Future of Payment Systems* (Routledge, Abingdon, 2007) at 2.

<sup>15</sup> For a more detailed overview of each of these sub-categories of wholesale payment systems, see John Armour et al. (n 5), chapter 18.

(i.e. the ability to transfer funds at both point of sale and remotely); ease of use (including widespread acceptance by merchants); certainty of payment (subject to some degree of payment reversibility for mistaken payments); liquidity; recordkeeping; safety and security, and financial inclusion.<sup>16</sup> While often articulated in somewhat different terms, these same features have been identified by a number of other scholars and policymakers.<sup>17</sup>

Ultimately, this list of features can be distilled down to two core economic functions: *storage* and *liquidity*.<sup>18</sup> The storage function has two components. The first component is the protection of customer funds from loss, theft, and destruction in the period between their transfer into the payment system and their eventual conversion or use to make a payment ('custodial' storage). While a bank vault is perhaps the archetypal example of a mechanism for ensuring custodial storage, the idea that funds are physically 'stored' in a bank or other financial institution is increasingly antiquated.<sup>19</sup> Instead, most custodial storage today takes place on the electronic recordkeeping systems of these institutions. The second component is the safe and secure transfer of stored funds to third parties ('transactional' storage). Like custodial storage, an increasing proportion of transactional storage today takes place electronically in the form of debit and credit card transactions, standing orders, and other electronic fund transfers.<sup>20</sup>

All payment systems provide some form of custodial and transactional storage. These payment systems then combine this storage with the promise of liquidity. As explained by Hal Scott, liquidity in this context refers to "the ability of an asset to be used

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<sup>16</sup> See Hal Scott, "The Importance of the Retail Payment System", Working Paper (16 December 2014), available at [www.ssrn.com](http://www.ssrn.com).

<sup>17</sup> See for example, Charles Kahn and William Roberts, "The Economics of Payment Finality", Federal Reserve Bank of Atlanta Economic Review (2<sup>nd</sup> Quarter 2002), available at <http://www.frbatlanta.org>, Summers (n 15) 2-7 and Gates Foundation, *Fighting Poverty, Profitably: Transforming the Economics of Payments to Build Sustainable, Inclusive Financial Systems* (September 2013), available at <http://www.gatesfoundation.org>.

<sup>18</sup> With the exception of financial inclusion, the achievement of which is not inherent in the performance of core storage and liquidity functions. A payment system can offer storage and liquidity on terms that still exclude the poor.

<sup>19</sup> Economist Milton Friedman notably disliked the use of the word 'storage' to characterize this function for precisely this reason; see Milton Friedman and Anna Schwartz, *A Monetary History of the United States, 1867-1960* (Princeton University Press, Princeton, 1971). Ultimately, however, Friedman's proposed alternative—'warehousing'—demonstrates just how difficult it can be to identify conceptually accurate terminology to describe core payment functions.

<sup>20</sup> For an overview of payment trends in the United States, see Federal Reserve, The Federal Reserve Payments Study 2016 (22 December 2016), available at <https://www.federalreserve.gov/newsevents/press/other/2016-payments-study-20161222.pdf>.

immediately and without delay to perform basic economic activities such as purchases of products and services and repayment of debt.”<sup>21</sup> Where an institution within the payment system accepts cash or other equivalent assets in exchange for a claim against the institution<sup>22</sup>, liquidity also encompasses the ability of the customer to *convert* that claim back into cash or cash equivalents upon demand.<sup>23</sup> The hallmark of perfect liquidity is thus the ability of a party to transfer or convert an asset rapidly and for full value.<sup>24</sup> Illiquidity, then, arises whenever a party experiences a delay in transferring or converting an asset, or where transferring or converting that asset within a short timeframe requires the party to accept a price below its full value.

The simultaneous provision of storage and liquidity is the essence of what banks promise to their depositors. As we shall see, this same promise resides at the heart of the shadow payment system. Importantly, however, the combination of these core payment functions presents a fundamental legal and public policy challenge. This challenge stems from the treatment of funds stored within these systems in the event that one or more of the institutions through which these systems perform these functions enters into bankruptcy. The bankruptcy of an institution will in many cases trigger the commencement of a formal bankruptcy process. While there is obviously significant variation in corporate bankruptcy law regimes around the world, two common features of these regimes are a *procedural rule* suspending enforcement action against assets held by the debtor<sup>25</sup> and a *substantive rule* under which unsecured creditors share in any

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<sup>21</sup> Scott (n 17) at 40. Summers refers to this function as “timeliness”: Summers (n 15) at 2.

<sup>22</sup> This will typically be the case for mobile money platforms (*see* n 173 below) and proprietary P2P payment systems (*see* n 146 et seq.). The position in relation to crypto-currency exchanges is more complex as these institutions may be designed to serve as mere conduits for the transfer of currencies/crypto-currencies, with the result that the customer (rather than the exchange) is the (intended) owner of the crypto-currency held within the system.

<sup>23</sup> Indeed, in many cases we would expect this convertibility to be a prerequisite to the willingness of third parties to accept the transfer of the claim on the institution as payment. Simultaneously, of course, it is also possible to imagine a ‘cashless’ society in which all payments were made electronically within the payment system itself. For a description of the potential benefits of a (near) cashless payment system and a proposal for how to go about achieving it, *see* Kenneth Rogoff, *The Curse of Cash* (Princeton University Press, Princeton, 2016).

<sup>24</sup> For an in-depth discussion of liquidity more generally, *see* Markus Brunnermeier and Lasse Pedersen, “Market Liquidity and Funding Liquidity” (2009), 22:6 *Review of Financial Studies* 2001.

<sup>25</sup> Phillip Wood, *Principles of International Insolvency*, 2<sup>nd</sup> ed. (Sweet & Maxwell, London, 2007) at [9-051]. The inclusion of secured creditors within the stay may be necessary to facilitate a value-maximising deployment of the debtor’s assets; *see* Thomas Jackson, *The Logic and Limits of Corporate Bankruptcy Law* (Beard Books 1986) at 182-183.

subsequent distribution of the debtor’s assets on a *pro rata* basis.<sup>26</sup> All other things being equal, we would expect the application of these procedural and substantive bankruptcy rules to have an impact on both the *timeframe* within which creditors can expect to receive repayment and, insofar as they are treated as unsecured creditors, the *value* that they ultimately receive. Importantly, even customers who enjoy a proprietary interest in assets held by the debtor—who we might otherwise expect to escape the impact of the substantive bankruptcy rule—may suffer significant delays in accessing these assets during the bankruptcy process by operation of the procedural rule. In other words, the legal treatment of stored funds in the event of an institution’s bankruptcy will have a direct impact on the credibility of its commitment to provide its customers with liquidity during periods of institutional stress.

In Parts 4 and 6, respectively, we examine the legal and regulatory strategies utilized within both the conventional banking and shadow payment systems to address this fundamental challenge. First, however, we must seek to better understand why this important insight regarding the impact of corporate bankruptcy law on the credibility of a payment system’s commitment to perform its core economic functions has been largely neglected within the existing academic and policy literature. In our view, the answer stems at least in part from the fact that the development of modern payments systems in many jurisdictions has been deeply intertwined with the development of the conventional banking system. In order to lay the groundwork for our subsequent analysis, we therefore begin by tracing the parallel development of modern banking and payment systems.

### **3. THE HISTORICAL DEVELOPMENT OF BANK-BASED PAYMENT SYSTEMS**

The history of payment systems in the United States, the United Kingdom, and Continental Europe is the history of banking and banks. The deeply intertwined development of these systems has meant that scholars and policymakers have been able to effectively disregard the fundamental legal and public policy challenge described in Part 2, safe in the knowledge that prudential regulatory regimes designed to enhance the stability of banks would also enhance the credibility of a bank’s commitment to perform its core payment functions. This section traces the parallel development of these

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<sup>26</sup> Except to the extent that they enjoy some priority or preferential status under applicable law; Wood (n 26) at [29-039].

systems, providing us with the historical backdrop to the recent unbundling of the conventional banking and payment systems. In the process, it also offers an explanation for why we have yet to fully come to grips with the risks stemming from the emergence and growth of the shadow payment system.

The origins of modern payment systems are often traced back to the development of the Italian banking system in the early 12<sup>th</sup> century.<sup>27</sup> Notarial records dating from 1200 describe Genovese bankers enabling their wealthy clients to make payments by means of book transfers on the accounts of the bank.<sup>28</sup> A merchant could make payment by directing his bank to debit his account and credit that of his agents, suppliers, or other creditors—provided that these creditors held an account at the same bank. These records also suggest the existence of relatively informal arrangements for facilitating payments between accounts held at different banks.<sup>29</sup> This same basic system of accounts, book transfers, and informal interbank payment arrangements was subsequently adopted by the Venetian banking system of the 13<sup>th</sup> through 15<sup>th</sup> centuries<sup>30</sup>, and eventually spread throughout much of Western Europe.<sup>31</sup>

In reality, of course, the institutions of medieval Continental finance were not generally known as ‘banks’. Nor in many cases did these institutions perform all the functions that we today associate with the business of ‘banking’. Instead, medieval financiers broadly fell into two categories: merchant bankers and money changers.<sup>32</sup> Merchant bankers were initially large commodity merchants—first of Italian and later German origin<sup>33</sup>—with extensive correspondent networks throughout Europe. Amongst their many

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<sup>27</sup> See Benjamin Geva, *The Payment Order of Antiquity and the Middle Ages: A Legal History* (Hart Publishing, Oxford, 2011) at 354 and Robert Lopez, “The Dawn of Medieval Banking” in Centre for Medieval and Renaissance Studies, University of California, Los Angeles (ed.), *The Dawn of Medieval Banking* (Yale University Press, New Haven, 1979). At the same time, there is a strong case to be made that these practices may have been imported from the Middle East and Asia.

<sup>28</sup> See Robert Reynolds, “A Business Affair in Genoa in the Year 1200: Banking, Bookkeeping, a Broker and a Lawsuit” in *Studi di Storia e Diritto in Onore di Enrico Besta* (Dott A Giuffrè, Milan, 1938).

<sup>29</sup> *Ibid.* and Geva (n 28) at 359. As described in greater detail below, these interbank payments were essentially handled through accounts that bankers held with one another.

<sup>30</sup> See *ibid.* and Reinhold Mueller, “The Role of Bank Money in Venice, 1300-1500” (1979), 3 *Studi Veneziani* 47.

<sup>31</sup> Geva (n 28) at 359.

<sup>32</sup> *Ibid.* at 355. A third category—pawnbrokers—played little or no role in the payment system. In practice, these categories were not mutually exclusive, with many institutions acting as both money changers and merchant banks; *ibid.*

<sup>33</sup> See Jean-Francois Bergier, “From the Fifteenth Century in Italy to the Sixteenth Century in Germany: A New Banking Concept?”, in *The Dawn of Modern Banking* (n 28).

important functions, these bankers combined lending and remittance services: extending credit in one geographic location and currency with the expectation that it would be repaid in another location and in another currency.<sup>34</sup>

The principal instrument through which these services were provided was the '*cambium*' or letter of payment. Letters of payment were a written acknowledgement by a borrower of funds received, and a corresponding direction to the borrower's foreign agent to repay these funds to the lender's foreign agent at a specified time, location, and denominated currency. The borrowed funds were typically used to purchase goods locally that were destined for export and sale by the borrower's foreign agent at the location stated in the letter of payment. Upon receipt, the lender's foreign agent would present the letter to the borrower's foreign agent for acceptance and, upon maturity, repayment.<sup>35</sup> The borrower's agent would then discharge the repayment obligation out of the proceeds generated from the sale of the goods. The lender's agent could then remit the repaid amounts back to the lender by entering into a 'reverse' letter of payment with a local merchant looking to purchase goods for export to the location at which the original lender was resident. Merchant bankers could also settle outstanding obligations at 'exchange' or 'payment' fairs, often held in conjunction with the Champagne and other fairs at which the goods were sold and, later, at commercial centers such as Florence, Bruges, Geneva, and London.<sup>36</sup> In effect, medieval merchant bankers combined trade financing, foreign exchange, and payment services.<sup>37</sup> In this and other important respects, merchant bankers were the forerunners of modern investment banks.<sup>38</sup> The institutional arrangements through which merchant banks provided these services—namely, letters of payment and exchange fairs—were also the precursors of modern bills of exchange and formal interbank clearing and settlement systems.<sup>39</sup>

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<sup>34</sup> Geva (n 28) at 356.

<sup>35</sup> Ibid. at 379-380.

<sup>36</sup> Ibid. at 382.

<sup>37</sup> Ibid. at 356.

<sup>38</sup> For a detailed description of how these medieval institutions evolved into modern day investment banks, see Alan Morrison and Bill Wilhelm, *Investment Banking: Institutions, Politics, and Law* (Oxford University Press, Oxford, 2007).

<sup>39</sup> See Geva (n 28) at 387-417 for a more in-depth discussion of the historical development and legal issues surrounding both letters of payment and bills of exchange.

Medieval money changers, in contrast, were engaged in the business of accepting deposits and investing deposited funds.<sup>40</sup> As part of the deposit-taking process, money changers would assess the authenticity and metal content of deposited coins and other currency and then credit the deposit holder's account an amount based on their assessment of its intrinsic value.<sup>41</sup> Money changers then enabled deposit holders to execute book transfers from their accounts to those of other deposit holders.<sup>42</sup> Book transfers between deposit holders with accounts at different money changers, meanwhile, were settled through networks of accounts that money changers held with other money changers.<sup>43</sup> Medieval money changers thus performed an important custodial and transactional storage function in an age where coins and other physical payment instruments were vulnerable to counterfeiting and debasement.

Following several high profile scandals involving money changers during the 16<sup>th</sup> century, public confidence in these institutions began to ebb, and authorities in many European countries intervened in the marketplace.<sup>44</sup> In many cases, this intervention involved the creation of a public bank to provide deposit and other payment services. One of the first such public banks was the Bank of Amsterdam. The Bank of Amsterdam was created in 1609 with a public guarantee from the City of Amsterdam.<sup>45</sup> Coins and bullion deposited in the Bank were credited to the account of the depositor in '*banco florin*'—a unit of account representing the value of a standardized 'light' coin.<sup>46</sup> The Bank would then facilitate book transfers between florin-denominated accounts, with settlement taking place daily and on a multilateral basis.<sup>47</sup> Similar public banks were established throughout western Europe during the 16<sup>th</sup> and 17<sup>th</sup> centuries, gradually

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<sup>40</sup> Ibid. at 356.

<sup>41</sup> Mueller (n 31) at 48.

<sup>42</sup> For this reason, money changers were often called "transfer bankers"; Geva (n 28) at 356.

<sup>43</sup> Ibid. at 359-361.

<sup>44</sup> Raymond de Roover, "New Interpretations of the History of Banking" in Julius Kirshner (ed.), *Business, Banking and Economic Thought in Late Medieval and Early Modern Europe: Selected Case Studies of Raymond De Roover* (University of Chicago Press, Chicago, 1974) at 219. Public authorities also intervened out of concerns that the deposit-taking activities of money changers threatened the integrity of ducal mints and coins; Geva (n 28) at 365.

<sup>45</sup> The creation of the Bank of Amsterdam was accompanied by a prohibition against money changers; Geva (n 28) at 364. While the prohibition was lifted in 1621, money changers were henceforth required to be licensed and maintain accounts with the Bank; *ibid.*

<sup>46</sup> Ibid. at 366.

<sup>47</sup> Ibid. at 367.



squeezing many private money changers out of the marketplace.<sup>48</sup> These public banks would play an important role in the Continental payment system until the end of the 18<sup>th</sup> century, before being supplanted by a series of institutional innovations that would together lay the foundations for the modern payment system.

If Continental Europe is the birthplace of the modern bank, the United Kingdom is the birthplace of the modern banking system. The origins of this system can be traced back to the activities of a small community of London goldsmiths. Prior to the English Civil War (1642-1651), the business of these goldsmiths consisted mainly of the manufacture of gold and silver plate and jewelry, along with the purchase and sale of precious jewels.<sup>49</sup> In this capacity, goldsmiths were often called upon to assess the purity of gold and silver coins. During the Civil War, the business of goldsmiths expanded to include the storage of this coinage for safekeeping.<sup>50</sup> By the late 17<sup>th</sup> century, the role of goldsmiths in providing for the safety and security of deposited funds had evolved into one in which they enjoyed full legal authority to use these funds to extend credit to the public.<sup>51</sup> The role of the goldsmiths thus began to more closely resemble the business model that is today synonymous with banks the world over: combining deposit-taking with the ability to use deposited funds to make loans and other investments.

This ‘Goldsmiths’ system’, as it came to be known, combined several features of the Continental system of merchant banks and money changers. First, as previously described, goldsmiths accepted deposits of coins and precious metals. They were also engaged in the business of discounting bills of exchange and promissory notes.<sup>52</sup> Goldsmiths would then issue receipts—or ‘notes’—to their depositors as documentary evidence of their deposits. These bank notes were payable either to the payee or to the bearer of the receipt.<sup>53</sup> In both cases, the notes represented the goldsmiths’ undertaking

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<sup>48</sup> de Roover (n 45) at 223.

<sup>49</sup> J. Milnes Holden, *The History of Negotiable Instruments in English Law* (The Athlone Press, London, 1955) at 71 and Geva (n 28) at 473.

<sup>50</sup> James Rogers, *The Early History of the Law of Bills and Notes: A Study of the Origins of Anglo-American Commercial Law* (Cambridge University Press, Cambridge, 1995) at 119 and Geva (n 28) at 474.

<sup>51</sup> Richard Richards, *The Early History of Banking in England* (AM Kelley, New York, 1965; reprint of 1929 ed.) at 37 and Geva (n 28) at 475.

<sup>52</sup> Bills of exchange evolved out of the letters of payment utilized by medieval Continental merchant bankers; see Raymond de Roover, *L'Evolution de la Lettre de Change XIV<sup>e</sup>-XVIII<sup>e</sup> Siècles* (Library Armand Colin, Paris, 1953) and Geva (n 28) at 369-418. The Goldsmiths’ system enabled the payee of a bill to obtain finance by endorsing the bill in exchange for its present value; Geva (n 28) at 475.

<sup>53</sup> *Ibid.* at 476.

to repay deposited funds on demand when presented with the receipt.<sup>54</sup> Depositors could also request drafts in any amount up to the full value of their deposit made payable to either the bearer or an identified payee. These drafts were the predecessors of modern cheques.<sup>55</sup> Both bank notes and cheques were payment instruments enabling the transfer of payment from debtors to creditors. In the case of bank notes, these instruments also came to possess a relatively high degree of transferability, thus enabling the holder of a note to exchange it for other goods and services. Final settlement would then take place when the provider of the goods and services, or any subsequent transferee, returned the note to the issuing bank—in effect demanding that the bank honor its obligation to deliver the deposited funds. These privately-issued bank notes were the precursor to modern fiat currency issued by central banks.<sup>56</sup>

A second important feature of the Goldsmiths' system was its network of correspondent relationships facilitating the clearing and settlement of payments *between* banks.<sup>57</sup> Initially, this network consisted of little more than individual banks maintaining a record of cheques drawn and cashed with other banks.<sup>58</sup> Settlement would then take place periodically on a bilateral basis, with the net debtor paying the net creditor in coins or other specie.<sup>59</sup> Over time, this network took on a more formal institutional structure.<sup>60</sup> In the early 1770s, a number of large London banks rented a room on Lombard Street in the City of London where their clerks would meet to clear and settle payments.<sup>61</sup> By 1775, clearing and settlement were taking place on Lombard Street on a daily basis.<sup>62</sup> In

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<sup>54</sup> Ibid.

<sup>55</sup> Ibid. at 476-477 and Holden (n 50) at 206-210.

<sup>56</sup> The transferability of bank notes was initially contentious as a matter of law. On the one hand, courts often took notice of the fact that these notes “could pass freely from hand to hand in payment of debts”; *Tassell and Lee v. Lewis* (1701) 1 Ld. Raym. 743 at 744, 91 E.R. 1397 t 1398 (K.B.). On the other hand, the application of the ‘conditional payment’ principle under English law meant that these notes were not in all cases accepted as final payment of a debt; *Ward v. Evans* (1702) 2 Ld. Raym. 928, 92 E.R. 120 (K.B.). This problem would not be fully resolved until the creation of the Bank of England (*see below*).

<sup>57</sup> *See generally*, Stephen Quinn, “Balances and Goldsmith-bankers: The Co-ordination and Control of Inter-banker Debt Clearing in Seventeenth-century London” in David Mitchell (ed.), *Goldsmiths, Silversmiths and Bankers: Innovation and the Transfer of Skill, 1550 to 1750* (Alan Sutton Publishing and Centre for Metropolitan History, London, 1995).

<sup>58</sup> Geva (n 28) at 494.

<sup>59</sup> Ibid.

<sup>60</sup> For a more detailed description of this transition, *see* William Lawson, *History of Banking*, 2<sup>nd</sup> edn. (Richard Bentley, London, 1885) at 215-216; Phillip Matthews, *The Bankers' Clearing House: What It Is and What It Does* (Pitman & Sons, London, 1921) at 9, and *ibid.* at 494-495.

<sup>61</sup> Ibid. at 495.

<sup>62</sup> Ibid.

1841, the bilateral system was replaced with a multilateral one, thereby reducing the overall volume and size of payments.<sup>63</sup> And in 1888, member banks officially established the London Clearing House.<sup>64</sup> These and other developments would be replicated in New York, Paris, and other financial centers over the course of the 19<sup>th</sup> century.<sup>65</sup>

The third and in some respects most important institutional innovation of the Goldsmiths' system was the creation of what was arguably the world's first modern central bank.<sup>66</sup> Established in 1694, the Bank of England was originally incorporated by statute in order to facilitate the extension of a loan to the government for the purpose of financing its war against France.<sup>67</sup> By the end of the 17<sup>th</sup> century, the Bank of England was the United Kingdom's only joint stock bank and had been appointed as banker to the government.<sup>68</sup> By the early 18<sup>th</sup> century, it had also been appointed as the principal agent for the issuance and circulation of short-term government securities.<sup>69</sup> The Bank modeled itself on the operations of the goldsmiths: accepting deposits of coin and other specie and issuing notes to depositors. Given its status as a joint-stock bank and close relationship with the government, however, Bank of England notes gradually overtook Goldsmiths' notes as a source of paper money.<sup>70</sup>

The Bank of England also came to play a central role within the evolving clearing and settlement system. By 1770, Bank of England notes had supplanted coin and other specie as the preferred settlement asset within the interbank clearing and settlement network.<sup>71</sup> Beginning in May 1854, settlement of payments through what would become the London Clearing House took place via the accounts of member banks held with the

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<sup>63</sup> Ibid.

<sup>64</sup> The London Clearing House survives to this day as LCH.Clearnet, although it no longer serves as a cheque clearing and settlement system; see <http://www.lchclearnet.com>.

<sup>65</sup> Geva (n 28) at 496.

<sup>66</sup> While the Sveriges Riksbank is older, its operations did not initially resemble those of a modern central bank. For example, the Riksbank was not permitted to issue notes until 1701.

<sup>67</sup> Richards (n 52) at 132-188 and Holden (n 50) at 87-88.

<sup>68</sup> Geva (n 28) at 486

<sup>69</sup> Ibid.

<sup>70</sup> Ibid. at 485 and Holden (n 50) at 87-88. The Bank of England's advantage was compounded by the fact that the ability of private bankers to issue notes was temporarily revoked between 1708 and 1826 and then permanently revoked in 1844; Geva (n 28) at 489. The last private note issuing firm lost its power to issue notes in 1921; *ibid.* at 490. Bank of England notes were made legal tender under the *Bank of England Act, 1833*, (U.K.), 3 & 4 Will. IV, c. 98, s. 6. This was reaffirmed under the *Currency and Bank Notes Act, 1954*, (UK), 2 & 3 Eliz. II, c. 12.

<sup>71</sup> Geva (n 28) at 495.

Bank of England.<sup>72</sup> By the end of the 19<sup>th</sup> century, the Bank of England was thus firmly entrenched at the heart of the United Kingdom's money, banking, and payments systems.

The Goldsmiths' model was replicated across Western Europe, largely supplanting public banks such as the Bank of Amsterdam. This model also had a significant influence on the development of banking and payment systems in The New World. Elements of the Goldsmiths' model appeared in the United States as early as 1690.<sup>73</sup> These first proto-banks issued promissory notes to depositors, typically secured against real property or precious metals.<sup>74</sup> As in the United Kingdom, these notes ultimately came to possess a degree of transferability and circulated widely as a form of paper money (although typically at a discount to their par value).<sup>75</sup> The first conventional deposit-taking, note-issuing bank was likely the Bank of Pennsylvania, created in 1780 to raise finance for the American Revolutionary War (1775-1783).<sup>76</sup> This was quickly followed by the creation of the first Bank of North America, which received the first federal bank charter on 26 May 1781.<sup>77</sup> Robert Morris, the United States Superintendent of Finance, advocated for the creation of the Bank of North America on the grounds that it would help stimulate investment in the real economy and, thereby, enhance government tax revenues.<sup>78</sup> Future Secretary of the United States Treasury Alexander Hamilton, meanwhile, saw the Bank of North America as an opportunity to create what he described as "a sufficient medium" of exchange.<sup>79</sup> Put differently, Hamilton sought to develop a banking system in order to support the development of a more robust system of money and payments.

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<sup>72</sup> The clearing house would then distribute amounts to individual creditors by way of a cheques drawn on its account at the Bank of England; *ibid.*

<sup>73</sup> William Sumner, *A History of Banking in Leading Nations*, Volume 1 (Journal of Commerce and Commercial Bulletin, New York, 1896) at 4, citing Trumbull Proc. Amer. Antiq. Soc. 1884.

<sup>74</sup> *Ibid.*

<sup>75</sup> For a more detailed description of these systems, *see* Charles Calomiris and Larry Schweikart, "The Panic of 1857: Origins, Transmission and Containment" (1991), 51 *Journal of Economic History* 807; Gary Gorton, "Free Banking, Wildcat Banking and the Market for Bank Notes", Wharton Finance Department Working Paper (1989), and Charles Calomiris and Larry Schweikart, "Was the South Backward? North-South Differences in Antebellum Banking During Crisis and Normalcy", Federal Reserve Bank of Chicago Working Paper (1988).

<sup>76</sup> Although, unlike conventional banks, the Bank of Pennsylvania was incorporated with a limited life; Sumner (n 74) at 14.

<sup>77</sup> Sumner refers to the Bank of North America as the first "specie paying, convertible bank note bank" in the United States; *ibid.* at 17.

<sup>78</sup> *Ibid.* at 15.

<sup>79</sup> *See* Alexander Hamilton, *Letter to Robert Morris* (30 April 1781), cited in *ibid.* at 12.

As Hamilton hoped, federal and state chartered banks came to play an important role in the nascent payment system. The Suffolk banking system offers an illustrative example. Beginning in the early 19<sup>th</sup> century, notes issued by rural ‘country’ banks in New England circulated as currency in Boston alongside notes issued by local ‘city’ banks.<sup>80</sup> Given the information, transportation, and other costs of redeeming these country notes, they predictably circulated at a discount to their par value.<sup>81</sup> Eventually, many Boston banks simply refused to accept these notes. This presented a problem for Boston merchants, who accepted country notes in the course of their trade but were then unable to deposit them with their local Boston bank. Merchants were instead forced to exchange these country notes for city notes through brokers, often at a considerable discount.<sup>82</sup>

Established in 1818, the Suffolk Bank was created by a group of influential Boston merchants in order to address this problem.<sup>83</sup> The Suffolk Bank committed to purchase the notes issued by country banks at par. In exchange, country banks were required to maintain permanent interest-free deposits with the bank, which in turn sorted deposited notes and credited and debited the accounts of its member banks. Member banks were also required to keep gold and silver with the Suffolk Bank and subjected to very basic prudential supervision.<sup>84</sup> The creation of the bank had the desired effect: allowing city and country notes to enjoy par convertibility within New England.<sup>85</sup> By 1838, over 300 New England banks redeemed their notes through the Suffolk Bank.<sup>86</sup> During this same

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<sup>80</sup> See George Trivoli, *The Suffolk Bank: A Study of a Free-enterprise Clearing System* (Adam Smith Institute, London, 1979). Similar systems existed in New York, Philadelphia, and other important commercial centers; *ibid.* at 6.

<sup>81</sup> *Ibid.*

<sup>82</sup> *Ibid.*

<sup>83</sup> *Ibid.* at 10.

<sup>84</sup> David Whitney, for example, documents several cases where the Suffolk Bank intervened to warn member banks that they were extending too much credit or taking on too much debt; see David Whitney, *The Suffolk Bank* (The Riverside Press, Cambridge, 1878) at 35-38.

<sup>85</sup> See Charles Calomiris and Charles Kahn, “The Efficiency of Self-Regulated Payment Systems: Learning from the Suffolk System”, National Bureau of Economic Research Working Paper No. 5442 (January 1996) at 19 and Gorton (n 76).

<sup>86</sup> Trivoli (n 81) at 11. The efficiency of the Suffolk banking system has been the source of considerable debate. Some viewed it as a powerful rent-seeking monopoly, others as lending stability to an otherwise chaotic system, thereby promoting greater trade. For a synthesis of this debate, see Calomiris and Kahn (n 86).

period, a number of other private interbank clearing and settlement systems emerged elsewhere in the United States.<sup>87</sup>

The adoption of the *National Banking Act, 1863*<sup>88</sup> represented the beginning of the end for this system of privately-issued bank notes.<sup>89</sup> The principal objective of the *National Bank Act* and subsequent legislation implementing what came to be known as the National Banking System was to substitute private bank notes with a national currency “licensed, manufactured, and guaranteed by the federal government”.<sup>90</sup> National banks were licensed to issue a given quantity of notes backed by the full faith and credit of the United States, while state and local bank notes were subject to a 10% tax.<sup>91</sup> The *National Bank Act* thus effectively unbundled the activities of bank lending from note issuance.<sup>92</sup> Henceforth, the principal payment liabilities of banks took the form of chequing accounts, with private interbank clearing and settlement systems emerging to facilitate this form of payment instrument.<sup>93</sup> The shift to the Goldsmiths’ model would be completed with the adoption of the *Federal Reserve Act, 1913*<sup>94</sup>, establishing the Federal Reserve System as the central bank of the United States, conferring upon it legal authority over note issuance, and thus firmly entrenching it at the apex of the banking and payment system. While the financial systems in the United States, United Kingdom, and elsewhere would continue to evolve over the course of the 20<sup>th</sup> century, the high level of operational integration between banking and payment systems would remain essentially intact.

The key insight from this brief historical overview is that the emergence and development of the payment systems in the United States, the United Kingdom, and Continental Europe have been inextricably intertwined with the development of banks.

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<sup>87</sup> This included systems in Indiana, Ohio, Iowa, and the Antebellum South, although the institutional features and functions of these systems varied widely; *see* Calomiris and Kahn (n 86) at 4-5 and Calomiris and Schweikart (n 76).

<sup>88</sup> ch. 58, 12 Stat. 665 (enacted 25 February 1863).

<sup>89</sup> For a detailed history of the composition of the United States’ money supply during the relevant period, *see* Friedman and Schwartz (n 20).

<sup>90</sup> Calomiris and Kahn (n 86) at 5.

<sup>91</sup> For a contemporaneous discussion of the impact of the establishment of the National Banking System, *see* Simon Newcomb, *A Critical Examination of Our Financial Policy During the Southern Rebellion* (Appleton, New York, 1865) at 199-222. *See also* Friedman and Schwartz (n 20) at 18-19.

<sup>92</sup> Calomiris and Kahn (n 86).

<sup>93</sup> *Ibid.*

<sup>94</sup> ch. 6, 38 Stat. 251 (enacted 23 December 1913).

Scholars and policymakers examining the functions and operations of modern payment systems have thus often taken for granted the fact that these systems are embedded within the unique institutional and regulatory environment that characterizes modern banking systems. In the next section, we describe how these deep historical connections are reflected in the current structure of payment systems in these jurisdictions. We also describe how deposit guarantee schemes, emergency liquidity assistance programs, special resolution regimes, and other prudential regulatory strategies have a direct and significant impact on the ability of bank-based payment systems to perform their important payment functions. This then enables us to turn our attention in Part 5 to the emerging shadow payment system: its operations, current legal and regulatory treatment, and the potential risks arising from the combination of storage and liquidity functions outside the perimeter of the regulated banking system.

#### 4. THE STRUCTURE OF MODERN BANK-BASED PAYMENT SYSTEMS

Reflecting their historical roots in the development of the conventional banking system, the structure of modern payment systems in most jurisdictions revolves around three core institutions. The first institution is a central bank such as the Federal Reserve, Bank of England, or European Central Bank. These central banks are endowed with the exclusive authority to issue liabilities—bank notes, coins, and central bank reserves (often referred to as “base”<sup>95</sup> money)—that serve as the ultimate settlement asset within the domestic banking and payment system. Deposit-taking banks then hold accounts with the central bank, thereby enabling interbank payments to be cleared and settled via book transfers on its accounts denominated in base money. As explained by Bruce Summers: “The central bank is the logical final settlement authority because of its unique status as an institution that does not pose credit or liquidity risks to its accountholders.”<sup>96</sup>

Residing directly beneath the central bank in most modern payment systems is a network of private deposit-taking banks. As described above, some or all of these banks will typically maintain accounts directly with the central bank for settlement purposes. Others may elect to settle interbank payments through correspondent accounts held with banks that maintain an account with the central bank. Banks play several related roles within these ‘tiered’ banking systems. First, banks provide the basic account architecture

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<sup>95</sup> See Gregory Mankiw, *Macroeconomics*, 9<sup>th</sup> ed. (Macmillan, New York, 2016), chapter 4. This “base” money can be contrasted with “near” money, which includes the deposit liabilities of conventional banks; *ibid.*

<sup>96</sup> Summers (n 15) at 5.

through which businesses, households, and governments make and receive most payments. Second, they facilitate ‘in bank’ payments from payors to payees with accounts at the same bank.<sup>97</sup> Where payors and payees hold accounts at different banks, meanwhile, banks clear and settle payments through the correspondent accounts they hold with one another.<sup>98</sup> Third, banks provide businesses and households with various instruments for making non-cash payments. These payment instruments include debit and credit cards, cheques, bank drafts, and various forms of electronic fund transfer.

Technological advances over the course of the last several decades have resulted in an enormous increase in the volume of interbank payments.<sup>99</sup> As the volume of payments has increased, so too have the demands on the technological and administrative infrastructure of both central banks and private bank correspondent networks. As a result, a large proportion of interbank payments are now cleared through automated clearing houses before being routed to a central bank or private settlement agent for final settlement.<sup>100</sup> In these systems, banks periodically transmit batches of payment instructions to a clearing house which, after sorting them and aggregating payments destined for the same bank, then transmit information to each participating bank regarding the details of payments to be made to their accountholders. As part of this process, the clearing house may also calculate and transmit net positions to the central bank or private settlement agent. Important clearing houses include the Federal Reserve Wire Network (Fedwire), Clearing House Interbank Payments System (CHIPS), and Automated Clearing House (ACH) in the United States, the Clearing House Automated Payment System (CHAPS) and Bankers’ Automated Clearing Systems (BACS) in the United Kingdom, and TARGET2 in the European Union.

*Figure 1* depicts the flow of funds within a stylized bank-based payment system, with a central bank residing at the apex of a network of deposit-taking banks linked by an

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<sup>97</sup> Ultimately, this form of payment is little more than a series of book transfers on the bank’s internal accounting system.

<sup>98</sup> Although, as described below, institutionally separate clearing and settlement systems have also developed to facilitate interbank transfers.

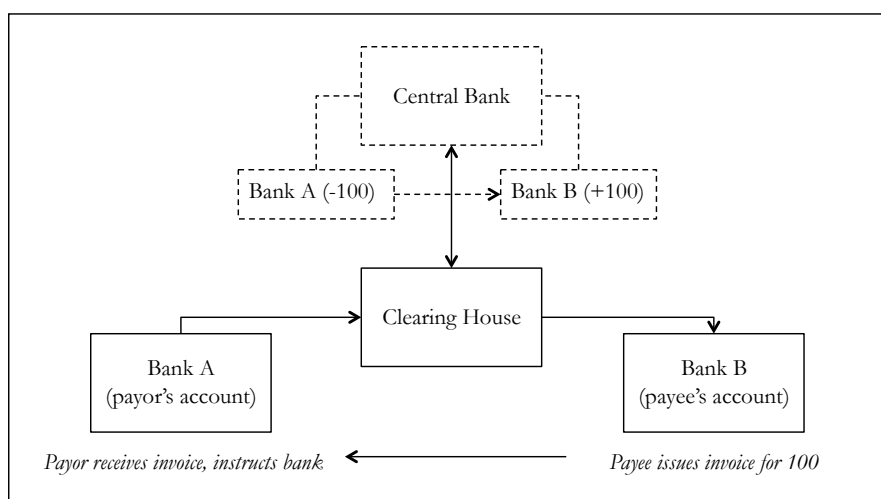
<sup>99</sup> For annual payment statistics collected by the CPMI, *see* [https://www.bis.org/statistics/payment\\_stats.htm?m=3|16|385](https://www.bis.org/statistics/payment_stats.htm?m=3|16|385).

<sup>100</sup> Likewise, the increasing volume of payments cleared through clearing houses has helped spur technological advancements in clearing house design. Perhaps most importantly, it has helped spur the shift from deferred net settlement to real-time gross settlement (RGTS) and, more recently, to hybrid RGTS systems; *see* Morten Bech and Bart Hobjin, “Technology Diffusion within Central Banking: The Case of Real Time Gross Settlement” (2007), 3 *International Journal of Central Banking* 147.



interbank clearing and settlement system. In this example, the accountholder at Bank A (the payor) receives an invoice for \$100 and instructs her bank to pay an accountholder at Bank B (the payee).<sup>101</sup> This instruction is communicated to the clearing house, which aggregates these payment instructions and communicates the net position as between Bank A and Bank B to the central bank. For the sake of simplicity, we assume that the \$100 is the only payment between accountholders at Bank A and Bank B over the relevant period. As both Bank A and Bank B in our example hold accounts at the central bank, the \$100 is transferred from Bank A to Bank B through their respective accounts held with the central bank. The transaction is then completed when Bank A debits \$100 from the payor's account and Bank B credits the payee's account the corresponding amount.

**Figure 1: The Stylized Structure of a Modern Payment System**



Viewed from this perspective, banks play a pivotal role within most modern payment systems: providing businesses and households with both custodial and transactional storage and liquidity. Indeed, in a very real way, a bank account has historically been a prerequisite to gaining access to the payment system in many jurisdictions.

Crucially, the reliance of banks on *short-term, liquid* deposits and other liabilities to finance the acquisition and holding of *longer-term, potentially illiquid* loans and other financial assets renders these institutions vulnerable to destabilizing runs by depositors and other

<sup>101</sup> This is a prototypical 'push' payment. This form of payment can be contrasted with so-called 'pull' payments initiated by the payee.

short-term creditors.<sup>102</sup> This vulnerability is typically framed in one of two ways. The first views runs as a multiple equilibrium (or coordination) problem amongst short-term creditors.<sup>103</sup> Pursuant to this account, each creditor's decision about whether to run is a function not only of their demand for liquidity and evaluation of the issuer's creditworthiness but also—and crucially—their subjective perception of whether *other creditors* are likely run.<sup>104</sup> The second views runs as a product of the realization by short-term creditors that assets they previously believed to represent reliable stores of nominal value—or “moneyness”<sup>105</sup>—are in fact sensitive to the revelation of new information about the creditworthiness of the issuer, the quality of any underlying collateral, or other variables.<sup>106</sup> Pursuant to this second account, rather than investing the time and energy necessary to incorporate this new information into the price of these assets, creditors may simply prefer to shift to less informationally sensitive substitutes that, in effect, possess a higher degree of moneyness.<sup>107</sup>

The prudential regulatory regimes governing banks in most jurisdictions include a range of strategies designed to minimize the probability and potential impact of institutional instability stemming from this mismatch between a bank's short-term, liquid liabilities and its longer term, illiquid investments. Three strategies in particular stand out.<sup>108</sup> The first strategy is *deposit insurance*. Deposit guarantee schemes come in a number of different shapes and sizes, but the basic strategy is to have a third party guarantee depositors' funds in the event of bank failure. This third party thus effectively steps into the shoes of the bank: honoring the bank's commitment to provide depositors with both

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<sup>102</sup> See Diamond and Dybvig (n 3); Allen et al. (n 3), and Gorton and Metrick (n 3). Notably, ‘liquidity’ in this context—often referred to as ‘funding’ liquidity—is different than that typically used in the payment context. In the context of a liquidity mismatch, funding liquidity refers to the ability of a financial institution to obtain funding for a given portfolio of assets; see Brunnermeier and Pedersen (n 25).

<sup>103</sup> See for example, Diamond and Dybvig (n 3).

<sup>104</sup> Ibid.

<sup>105</sup> Milton Friedman and Anna Schwartz, *Monetary Statistics of the United States: Estimates, Sources, Methods, and Data* (Columbia University Press, New York, 1970) at 151-152 and John Hicks, *Value and Capital*, 2<sup>nd</sup> ed. (1946; reproduced by Clarendon Press, Oxford, 2001) at 163.

<sup>106</sup> See for example, Gary Gorton, *Slapped in the Face by the Invisible Hand: The Panic of 2007* (Oxford University Press, New York, 2010) and Bengt Holmstrom, “Understanding the Role of Debt in the Financial System”, Bank for International Settlements Working Paper No. 479 (January 2015), available at <http://www.bis.org>. The key difference between this and multiple equilibrium views of run-like behavior is the absence of a coordination problem: i.e. creditors in this second view do not switch in anticipation of the decisions of other creditors.

<sup>107</sup> Ibid.

<sup>108</sup> While not discussed in any detail here, central banks may also provide intra-day and other liquidity assistance to clearing houses; see Armour et al. (n 5), chapter 18.

storage and liquidity during periods of institutional stress.<sup>109</sup> In order to make this commitment credible, the third party guarantee is typically provided by the government through institutions such as the U.S. Federal Deposit Insurance Corporation (FDIC). This institution must also typically commit to pay depositors on a timely basis in the event of bank failure—ideally within a matter of days.<sup>110</sup> The introduction of deposit insurance beginning in the United States in the 1930s is often credited with having significantly enhanced the level of consumer protection enjoyed by bank depositors. However, insofar as deposit guarantee schemes generally only protect a subset of a bank’s short-term creditors—typically retail depositors with accounts below a prescribed threshold—it is at best an incomplete strategy for minimizing the inherent fragility of bank balance sheets.

The second strategy is ‘lender of last resort’ or *emergency liquidity assistance*. Distilled to its essence, emergency liquidity assistance is “the discretionary provision of liquidity to a financial institution (or the market as a whole) by the central bank in reaction to an adverse shock which causes an abnormal increase in demand for liquidity which cannot be met by an alternative source.”<sup>111</sup> In effect, emergency liquidity assistance is designed to pump base money into the financial system, thereby offsetting the liquidity demands of depositors and other short-term creditors and signaling to the marketplace that the central bank will provide whatever support is necessary to restore market confidence and stability.<sup>112</sup> This support typically takes the form of short-term loans to banks or other

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<sup>109</sup> The third party then steps into the shoes of the depositor in order to seek redress from the estate of the bank.

<sup>110</sup> In this very important respect, some deposit guarantee schemes are more effective than others. For a comparison of the pre-crisis schemes in the United States and United Kingdom, for example, see Armour et al. (n 5), chapter 15.

<sup>111</sup> Xavier Freixas, Curzio Giannini, Glenn Hoggarth, and Farouk Soussa, “Lender of Last Resort: A Review of the Literature”, Bank of England Financial Stability Review (1999) 151 at 152.

<sup>112</sup> See Walter Bagehot, *Lombard Street: A Description of the Money Market* (1873, reprinted by John Wiley & Sons, London, 1999), chapters 2 and 8. Bagehot’s dictum prescribes that emergency liquidity assistance be extended “freely”, but at a penalty rate of interest, against adequate collateral, and only to illiquid but not insolvent banks; *ibid.* at 57. While Bagehot is often credited with having first articulated these principles, that honour largely falls to fellow Englishman Henry Thornton; see Henry Thornton, *An Enquiry into the Nature and Effects of the Paper Credit of the United Kingdom* (King and Compton, London, 1802; reprinted Farrar and Rinehart, New York, 1939). For a brief history of the development of these facilities, see Thomas Humphrey, “Lender of Last Resort: The Concept in History”, Federal Reserve Bank of Richmond Economic Review (March/April 1989); Mark Carlson and David Wheelock, “The Lender of Last Resort: Lessons from the Fed’s First 100 Years”, Federal Reserve Bank of St. Louis Working Paper No. 2012-056B (2013); Rosa Lastra, *International Financial and Monetary Law*, 2<sup>nd</sup> ed. (Oxford University Press, Oxford, 2015) at 4.08-4.36, and Freixas et al. (n 113).

financial institutions experiencing temporary liquidity problems.<sup>113</sup> These loans are fully secured by a pledge of eligible collateral assets by the financial institution receiving emergency liquidity assistance. Eligible collateral assets generally include commercial loans, residential and commercial mortgages, government securities, and investment grade bonds, asset-backed securities, and other fixed income instruments. These assets are then subject to a discount designed to protect the central bank against any decreases in the market value of pledged collateral.<sup>114</sup>

The third strategy is the creation of *special bankruptcy or 'resolution' regimes* for failing banks. Whereas emergency liquidity assistance facilities are designed to provide support to solvent but temporarily illiquid banks, special resolution regimes are designed to restructure or wind down the operations of banks that are at the risk of crossing—or have already crossed—over the threshold into bankruptcy.<sup>115</sup> Special resolution regimes provide bank regulators with powerful tools in pursuit of this objective.<sup>116</sup> These tools typically include the ability to write-down specified bank liabilities, convert a bank's

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<sup>113</sup> The institutional frameworks through which central banks provide emergency liquidity assistance vary from jurisdiction to jurisdiction. In the United States, the Federal Reserve has historically provided emergency liquidity assistance to eligible member banks principally through its discount window, a standing collateralized loan facility; see Federal Reserve Regulation A, available at <http://www.ecfr.gov>. See also <http://www.frbdiscountwindow.org>. The Fed can also extend emergency liquidity assistance through its open market operations: i.e. the purchase and sale of securities on the open market. Pursuant to section 13(3) of the Federal Reserve Act, the Fed can also extend emergency liquidity assistance to non-bank financial institutions under certain conditions in the event of “unusual and exigent circumstances”. The provision of emergency liquidity assistance under section 13(3) must be pursuant to program or facility with “broad-based” eligibility, thereby prohibiting *ad hoc* support to individual institutions. Unlike discount window lending, institutions in receipt of emergency liquidity assistance under section 13(3) must also demonstrate that they cannot secure credit accommodation from other financial institutions. In the United Kingdom, the Bank of England operates its discount window and emergency liquidity assistance facilities under separate frameworks, each of which are available to banks, building societies, securities dealers, and central counterparties; for a detailed description of the discount window facility, see Bank of England, *Sterling Monetary Framework* (June 2015), available at <http://www.bankofengland.co.uk/markets/Documents/money/publications/redbook.pdf>. Emergency liquidity assistance is provided under a separate, largely unpublished, framework and can be provided to any entity (including but not limited to financial institutions).

<sup>114</sup> This discount takes the form of a decrease in the amount of the loan that can be secured against any given collateral asset.

<sup>115</sup> For a more detailed examination of the development and functions of special resolution regimes, see John Armour, “Making Bank Resolution Credible” in Eilis Ferran, Niamh Moloney, and Jennifer Payne (eds.), *Oxford Handbook of Financial Regulation* (Oxford University Press, Oxford, 2015).

<sup>116</sup> Once again, these frameworks vary from jurisdiction to jurisdiction. See for example, *FDIC Resolutions Handbook* (20 November 2015), available at <https://www.fdic.gov/bank/historical/reshandbook/> (describing the FDIC's approach to resolution); Directive 2014/59/EU establishing a framework for the recovery and resolution of credit institutions and investment firms (15 May 2014) [the ‘BRRD’] (prescribing the approach to resolution that must be adopted by member states of the European Union), and Bank of England, *The Bank of England's Approach to Resolution* (October 2014), available at <http://www.bankofengland.co.uk/financialstability/Documents/resolution/apr232014.pdf> (describing the United Kingdom's approach to resolution).

outstanding debt into equity, and transfer some or all of a bank's assets to a public sector 'bridge bank' or private sector purchaser. Armed with these tools, the expectation is that regulators will trigger the resolution process after the close of business on Friday, with the restructured bank then able to open its doors for business as usual on Monday morning. Importantly, one of the principal rationales underpinning the introduction of special resolution regimes has been to ensure that banks can continue to perform their core payment functions during the resolution process.<sup>117</sup>

The combination of deposit guarantee schemes, emergency liquidity assistance facilities, and special resolution regimes enable banks to continue to perform their socially useful storage, liquidity, and other functions under conditions where the strict application of corporate bankruptcy law would otherwise dictate, at best, a costly restructuring and, at worst, liquidation. This extraordinary treatment—not generally available to other commercial enterprises—is typically justified on the basis of the unique vulnerability of bank balance sheets to destabilizing runs, the externalities associated with bank failure, and the risk that conventional bankruptcy proceedings may transmit or magnify financial shocks.<sup>118</sup> Importantly, it is also justified on the basis that these strategies help ensure the smooth and efficient operation of bank-based payment systems during periods of institutional or systemic distress.<sup>119</sup> This leads inexorably to the question: what happens when institutions provide core payment functions outside of the unique and highly specialized legal and regulatory environment imposed on conventional deposit-taking banks? It is to this important question that we now turn.

## **5. THE EMERGENCE AND RISKS OF THE SHADOW PAYMENT SYSTEM**

Payment systems in the United States, the United Kingdom, and Continental Europe have undergone a series of significant institutional innovations over the course of the past 800 years. The pace of this innovation has accelerated in recent decades as a result of technological advancements in data storage, analysis, and transmission. Amongst other important developments—from ATMs, to chip and pin technology, to the hybrid RGTS payment systems that facilitate billions of interbank payments—these

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<sup>117</sup> See for example, the BRRD (n 122) at Recital 5; Bank of England (n 122) at 3, and United Kingdom Independent Commission on Banking, *Final Report: Recommendations* (13 September 2011) at 20, available at <http://webarchive.nationalarchives.gov.uk>.

<sup>118</sup> See Armour et al. (n 5) at 456-459.

<sup>119</sup> See for example, the BRRD (n 122), Bank of England (n 122), and Independent Commission on Banking (n 122).

technological advancements have spurred the emergence and growth of a vibrant and diverse *shadow* payment system.

The shadow payment system encompasses a broad range of financial institutions that nevertheless share two core features. First, they perform the same basic payment functions as conventional deposit-taking banks: providing customers with custodial and transactional storage and liquidity. While some of these institutions also perform credit, liquidity, and maturity transformation similar to conventional deposit-taking banks—thereby making them part of the shadow *banking* system<sup>120</sup>—this is ultimately a separate question from whether they should also be considered part of the shadow payment system. Simultaneously, of course, the extent to which the balance sheets of these institutions exhibit credit, liquidity, or maturity mismatches will have a bearing on the risk of bankruptcy, and on the suitability of different strategies that might be employed to ensure the continued performance of payment functions during periods of institutional distress. Second, these institutions perform these functions outside the perimeter of the regulated banking system. As a result, they do not directly benefit from the deposit guarantee schemes, emergency liquidity assistance facilities, special resolution regimes, and other prudential regulatory regimes designed to ensure that bank-based payment systems can continue to function during periods of institutional or systemic stress, unencumbered by the strict application of corporate bankruptcy law. This section describes three of the most important and high profile species of institutions within the shadow payment system: crypto-currency exchanges, P2P payment systems, and mobile money platforms. This description does not represent a comprehensive taxonomy: the shadow payment system is growing and evolving too rapidly to be mapped in its entirety. Instead, these institutions have been selected with a view to highlighting the key risks that arise from the bundling of storage and liquidity functions outside the regulated banking system.

#### (a) *Crypto-Currency Exchanges*

One of the most noteworthy developments in global finance within the past decade has been the emergence and proliferation of so-called ‘crypto-currencies’. Crypto-currencies

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<sup>120</sup> See Zoltan Pozsar, Tobias Adrian, Adam Ashcraft, and Hayley Boesky, ‘Shadow Banking’ (2013), 19:2 Federal Reserve Bank of New York Economic Policy Review 1 (defining the shadow banking system as consisting of non-bank financial intermediaries that perform credit, maturity, and liquidity transformation without access to emergency liquidity assistance and other forms of government support).

are digital currencies that employ encryption techniques to create and verify the transfer of funds. These private currencies operate outside the public monetary frameworks administered by central banks. By far and away the most popular crypto-currency is Bitcoin, with a market capitalization of over \$USD17 billion as of 29 March 2017.<sup>121</sup> The backbone of the Bitcoin payment system is an open source protocol known as blockchain. Blockchain is a decentralized—or ‘distributed’—public ledger shared amongst a P2P network comprised of all Bitcoin users. Whenever a Bitcoin is transferred from one user to another, network participants verify settlement of the transaction using sophisticated algorithms as part of a process known as Bitcoin ‘mining’.<sup>122</sup> Once verified, the transaction is then permanently added to the distributed ledger, thus creating a single historical record of all transactional activity.<sup>123</sup> The growth potential of Bitcoin itself as a means of making and receiving payments is somewhat limited due to its relatively small and strictly controlled supply.<sup>124</sup> Nevertheless, the broader growth potential of crypto-currencies built around the blockchain protocol is enormous, as arguably reflected by the fact that Bitcoin is now accepted by over 100,000 retailers, including Expedia, Dell, Microsoft, PayPal, and Amazon.<sup>125</sup>

The emergence of Bitcoin and other crypto-currencies has spurred the development of an entirely new species of financial intermediary: crypto-currency *exchanges*.<sup>126</sup> Crypto-currency exchanges facilitate the conversion of crypto-currencies into conventional fiat currencies such as the U.S. dollar, pound sterling, and euro. The first generation of crypto-currency exchanges performed this function in two operationally distinct stages.<sup>127</sup>

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<sup>121</sup> See <http://www.coinmarketcap.com>. By way of comparison, the market capitalization of the second most popular crypto-currency, Ethereum, is just under \$USD4.7 billion; *ibid*.

<sup>122</sup> In exchange for verifying transactions, these ‘miners’ are rewarded with newly created Bitcoins. For further information, see Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (8 November 2008), available at <http://bitcoin.org>.

<sup>123</sup> See Mohit Kaushal and Sheel Tyle, “The Blockchain: What It Is and Why It Matters”, The Brookings Institution (13 January 2015), available at <http://www.brookings.edu>.

<sup>124</sup> The Blockchain protocol contemplates that the reward for verifying transactions will decrease over time, reaching zero when the total number of outstanding Bitcoins reaches 21 million; see Nakamoto (n 128).

<sup>125</sup> See Anthony Cuthbertson, “Bitcoin Now Accepted by 100,000 Merchants Worldwide”, *International Business Times* (4 February 2015), available at <http://www.ibtimes.co.uk>. At the same time, there is very little publicly available information regarding the volume of Bitcoin-denominated payments processed by these retailers.

<sup>126</sup> This is in some respects ironic given that one of the most frequently cited benefits of blockchain is that it does not rely on (conventional) financial intermediaries; see for example, Kaushal and Tyle (n 129).

<sup>127</sup> While operationally distinct, these stages do not necessarily occur sequentially: i.e. the seller may transfer the Bitcoin to the exchange *before* a buyer is identified. For a discussion of foreign exchange payment

In the first stage, the exchange performs essentially the same function as a conventional stock exchange: matching buyers and sellers of Bitcoin and other currencies. In the second stage, the prospective seller transfers the Bitcoin to the exchange for sale. The buyer is then responsible for ensuring that it provides the exchange with sufficient funds, denominated in the appropriate currency, to complete the purchase. Once both the Bitcoin and other funds have been successfully transferred to the exchange, the trade is then cleared and settled: with the Bitcoin transferred to the buyer, and the corresponding funds to the seller. In this important respect, the first generation of crypto-currency exchanges employed a payment-versus-payment (PvP) system similar to the Continuous Linked Settlement (CLS) system through which a large proportion of the foreign exchange transactions in the world's major currencies flow.<sup>128</sup>

Until recently, the world's largest crypto-currency exchange was Mt. Gox. Founded in Tokyo in 2009 as a platform for exchanging trading cards based on the game *Magic: The Gathering*<sup>129</sup>, Mt. Gox quickly evolved to become one of the cornerstones of the nascent Bitcoin payment system. At its peak in 2013, it has been estimated that Mt. Gox accounted for approximately 70% of global Bitcoin trading activity.<sup>130</sup> In retrospect, however, this success masked a number of significant institutional problems. In June 2013, Mt. Gox was forced to temporarily suspend U.S. dollar conversion amidst widespread rumors that the exchange was on the verge of bankruptcy.<sup>131</sup> In November 2013, *Wired* magazine reported that customers were experiencing delays of weeks, and in some cases months, before they were able to withdraw their funds.<sup>132</sup> Then, on 28 February 2014, Mt. Gox filed for bankruptcy protection in Tokyo, reporting liabilities of approximately ¥6.5 billion (\$USD64 million) against assets of approximately ¥3.84 billion (\$USD38 million). As part of the bankruptcy filing, the firm reported that about 750,000 Bitcoins belonging to customers, along with another 100,000 belonging to Mt.

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systems that do not rely on this sort of mechanism, see Marcel Rosner and Andrew King, "Understanding and Regulating Twenty-First Century Payment Systems: The Ripple Case Study" (2016), 114 *Michigan Law Review* 649.

<sup>128</sup> See Armour et al. (n 5), section 18.2.3 for further information regarding the mechanics of PvP settlement systems such as CLS.

<sup>129</sup> See Paul Vigna, "5 Things About Mt Gox's Crisis", *Wall Street Journal* (24 February 2014), available at <http://blogs.wsj.com>.

<sup>130</sup> See Robert McMillan and Cade Metz, "The Rise and Fall of the World's Largest Bitcoin Exchange", *Wired* (6 November 2013), available at: <http://www.wired.com>.

<sup>131</sup> Ibid.

<sup>132</sup> Ibid.



Gox itself, were unaccounted for and had likely been stolen.<sup>133</sup> On the basis of Bitcoin's market price as of the date of the bankruptcy filing, this translated into over \$USD470 million in missing assets.<sup>134</sup>

Two subsequent events are noteworthy. First, on 14 March 2014, Mt. Gox filed for Chapter 15 bankruptcy protection in the United States<sup>135</sup> in order to invoke an automatic stay that would prevent enforcement by aggrieved customers against assets situated in the U.S.<sup>136</sup> Second, on 5 August 2015, an action by a customer against the Japanese bankruptcy trustee for the recovery of Bitcoin that remained within the control of the exchange failed, with the District Court finding that under the applicable Japanese law customers could not remain owners of Bitcoin once it had been transferred to the exchange.<sup>137</sup> The end result appears to be that customers who held Bitcoin with Mt. Gox will be treated as unsecured creditors whether or not the Bitcoin remains within the control of the exchange, and will be barred from enforcing these unsecured claims by procedural restrictions imposed by both United States and Japanese bankruptcy law. Understandably, many customers have since sold their unsecured claims in the estate of Mt. Gox at a steep discount<sup>138</sup>, and it remains unclear what percentage of their assets remaining customers should ultimately expect to recover.

The bankruptcy of Mt. Gox vividly illustrates the risks that the shadow payment system can pose to customers. These risks flow from two principal sources. The first is the prospect of delayed transfer or conversion during the bankruptcy process (*illiquidity*). This risk will be especially problematic where customers store assets within a shadow

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<sup>133</sup> See Robin Sidel, Eleanor Warnock, and Takashi Mochizuki, "Almost Half a Billion Worth of Bitcoins Vanish: Mt. Gox Says it Lost 750,000 of Customers' Bitcoin to Fraud", *Wall Street Journal* (28 February 2014), available at <http://www.wsj.com>.

<sup>134</sup> *Ibid.*

<sup>135</sup> See *In Re Mt. Gox Co., Ltd.*, Emergency Application for an Order Granting Provisional Relief pursuant to sections 105(a) and 1519 of the U.S. Bankruptcy Code (10 March 2014), available at <http://docs.dpaq.de/6692-mtgox1.pdf>.

<sup>136</sup> See *Gregory Greene and Joseph Black v. Mt. Gox et al.*, First Amended Class Action Complaint (14 March 2014), available at <https://cdn.arstechnica.net/wp-content/uploads/2014/03/Greene-MtGox-1st-Amend-Complaint.pdf>.

<sup>137</sup> See Tokyo District Court (5 August 2015) 2015WLJPCA08058001. The applicants in the case had relied on the right to segregation provided in Art. 62 of the Japanese Bankruptcy Act. See also "Bitcoins lost in Mt. Gox debacle 'not subject to ownership claims'", *Japan Times* (6 August 2015), available at <http://www.japantimes.co.jp>.

<sup>138</sup> Bitcoin Builder, for example, has offered to buy customers' Mt. Gox Bitcoin at 0.11 per Bitcoin; see "The Mt. Gox Post-Bankruptcy Claims: A Detailed Guide", *Blockchain Agenda* (8 May 2015), available at <http://insidebitcoins.com>.

payment system with a view to eventually making payments for essential goods and services such as food and shelter. This risk will also arise where customers rely heavily on these systems to make or receive day-to-day payments, or where they maintain positive balances for extended periods of time. The second risk is the potential write-down of customers' funds arising from their treatment as unsecured liabilities in the context of any bankruptcy proceeding (*loss of value*). Indeed, in many cases, unsecured claimants can expect to recover little if anything following the conclusion of the bankruptcy process. These risks can then intersect—as they did in the case of Mt. Gox—insofar as the need for liquidity compels customers to liquidate their claims at a significant discount to their nominal value.

#### (b) P2P Payment Systems

While the failure of Mt. Gox provides us with useful insights into the potential risks that the shadow payment system poses to customers, crypto-currency exchanges ultimately exist on the fringes of the modern payment system. Somewhat closer to the center of this system are a growing number of P2P payment systems. P2P payment systems utilize the internet to convey payment information and execute electronic fund transfers. In a typical P2P transaction, the payor initiates a fund transfer by entering the payee's email address and payment instructions via a secure website. The system then generates an email informing the payee of the in-bound payment.

There are two different types of P2P payment systems, distinguished by the nature of the accounts through which the funds are stored and transferred. In *bank-based* P2P systems, the system facilitates the direct transfer of funds between demand deposit or other accounts held by the payor and payee with conventional banks.<sup>139</sup> Thus, for example, when you use Apple Pay to buy a triple shot, no foam, soy latte at Starbucks, the technology embedded in your iPhone uses near field communication technology to send encrypted payment information to the store's card reader. The funds are then transferred directly from your bank account to Starbucks, without ever passing through Apple's hands. Bank-based P2P systems thus do not perform any custodial or transactional storage function. Indeed, these systems are perhaps best understood as technology platforms that merely facilitate retail *interbank* transfers.

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<sup>139</sup> Kenneth Kuttner and James McAndrews, "Personal On-Line Payments", Federal Reserve Bank of New York Economic Policy Review (December 2001) at 35 and 37.

*Proprietary account* P2P systems, in contrast, facilitate the transfer of funds via book transfers between customer accounts held and administered by institutions within shadow payment system itself.<sup>140</sup> These accounts can be funded using a debit or credit card, or from the proceeds of previous in-bound fund transfers. Importantly, payees can either choose to transfer paid-in funds to a conventional bank account or, alternatively, store the funds in the system’s proprietary accounts for the purpose of making future payments. Unlike bank-based P2P systems, proprietary account P2P systems are thus specifically designed to provide customers with transactional and custodial storage and liquidity.

P2P payment systems offer a number of potential advantages relative to other forms of electronic fund transfer. These advantages are best understood in the context of online auction sites such as eBay.<sup>141</sup> Many sellers on eBay are private individuals looking to sell a particular article—e.g. an old sofa, unloved musical instrument, or Star Wars™ collectibles—but who are not otherwise engaged in the business of manufacturing or selling these articles. Many other sellers are small businesses for whom the costs of merchant banking services enabling them to accept credit card payments, for example, are often prohibitively high. Moreover, given the anonymity of online auctions, buyers are understandably hesitant to provide sensitive financial information to sellers. Accordingly, as Ronald Mann explains: “purchasers in the early days of eBay had to use cashier’s checks or money orders. Typically, sellers waited to ship products until they received the paper-based payment device in the mail.”<sup>142</sup> The development of P2P payment systems solved both of these problems: offering a fast, easy, affordable, and secure way of making payments between anonymous buyers and sellers.

There are currently a number of different P2P payment systems, including Apple Pay, Google Wallet, Venmo, Dwolla, and AliPay by Alibaba. However, by far the most ubiquitous P2P payment system is PayPal.<sup>143</sup> PayPal was acquired by eBay in 2002 as a

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<sup>140</sup> Payors and, in most cases, payees are thus required to open an account with the system as a precondition to its use; *ibid.*

<sup>141</sup> *See* Kuttner and McAndrews (n 145) at 35 and Ronald Mann, “Regulating Internet Payment Intermediaries” (2003), 82 *Texas Law Review* 681 at 681-682.

<sup>142</sup> Mann (n 147) at 683-684.

<sup>143</sup> While AliPay technically has more active accounts (approximately 400 million as of December 2016), the vast majority of these accounts are held by customers in China.

replacement for its own, far less popular, P2P payment system.<sup>144</sup> In July 2015, eBay then spun off PayPal into an independent publicly-listed company.<sup>145</sup> As of 31 December 2016, PayPal had approximately 197 million active accounts supporting payments in over 100 currencies.<sup>146</sup> The total volume of payments processed through PayPal in 2016 was approximately \$USD354 billion—roughly \$USD11,225 every second.<sup>147</sup>

PayPal is a proprietary account P2P payment system. Purchasers are able to fund their accounts using debit or credit cards, electronic fund transfers from their bank, or with any positive balance they maintain in their PayPal account. Interestingly, recent data suggests that many customers maintain positive balances in their PayPal account, thus using the system as a mechanism for custodial storage. According to PayPal’s 2016 Annual Report, PayPal’s funds receivable and customer accounts totaled over \$USD14.3 billion.<sup>148</sup> Even more interesting is PayPal’s stated policy regarding these balances. As explained in PayPal’s U.S. terms and conditions: “If you do hold a Balance, that Balance represents an unsecured claim against PayPal and is not insured by the FDIC... PayPal will not voluntarily make Balances available to its creditors in the event of bankruptcy.”<sup>149</sup> The corresponding language in PayPal UK’s user agreement reads: “If you hold a Balance you will not receive interest or any other earnings on this Balance because the Balance represents e-Money and not a deposit.”<sup>150</sup> The UK user agreement goes on to define e-Money as: “monetary value, as represented by a claim on PayPal, which is stored on an electronic device, issued on receipt of funds, and accepted as a means of payment by persons other than PayPal.”<sup>151</sup>

PayPal’s customer documentation in both the United States and United Kingdom makes it reasonably clear that customer balances will be treated as unsecured liabilities in the

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<sup>144</sup> See Nick Wingfield and Jathon Sapsford, “eBay Plans to Buy PayPal In \$1.4 Billion Stock Deal”, *Wall Street Journal* (9 July 2002), available at <http://www.wsj.com>.

<sup>145</sup> See Press Release, “PayPal Celebrates Listing on Nasdaq and Completes Separation from eBay Inc.” (20 July 2015), available at <http://www.paypal.com>.

<sup>146</sup> PayPal Holdings, Inc. 2016 Annual Report (Form 10K) for period ending 31 December 2016, available at <https://investor.paypal-corp.com>.

<sup>147</sup> Ibid.

<sup>148</sup> Ibid.

<sup>149</sup> PayPal U.S. User Agreement, s. 5.1, available at <https://www.paypal.com>.

<sup>150</sup> PayPal UK User Agreement for PayPal Service, s. 5.1, available at <https://www.paypal.com>.

<sup>151</sup> Ibid. s. 15.

event of PayPal's bankruptcy. As a result, customer funds held within PayPal's proprietary accounts are vulnerable to delayed transfer and conversion, along with potential loss of value, in the context of any bankruptcy process. Viewed from this perspective, the risks to PayPal customers are broadly similar to those that ultimately materialized in the case of Mt. Gox.<sup>152</sup>

*(c) Mobile Money Platforms*

If P2P systems such as PayPal represent the current state of the shadow payment system in places like the United States, the United Kingdom and Europe, mobile money platforms represent one of its many potential futures—especially in emerging markets. The term ‘mobile money’ is used to describe a number of different institutional platforms through which mobile phone companies offer custodial and transactional storage and liquidity. Mobile money platforms enable customers to deposit and withdraw funds through a network of local agents, including post offices, corner stores, petrol stations, and other retail establishments.<sup>153</sup> These platforms then enable customers to use their mobile phones to transfer deposited funds—so-called ‘e-money’—via SMS text messages to their friends, family, merchants, and public authorities. Initially, many mobile money platforms were limited to facilitating payments between customers of the same mobile network. Increasingly, however, mobile providers have coordinated in the development of ‘interoperable’ platforms facilitating payments between customers of different networks.<sup>154</sup>

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<sup>152</sup> Of course, should PayPal ultimately meet a similar fate, its broader customer base and considerably higher transaction volume could potentially mean that its failure had a far more significant and widespread market impact. However, this is by no means a certainty. Conversely, if the current \$USD14.3 billion is widely dispersed amongst PayPal's retail customers, then it may very well be the case that its bankruptcy would have little or no impact on either customer wealth or the operation of the wider (shadow) payment system.

<sup>153</sup> As of December 2015, Groupe Speciale Mobile Association (GSMA), a leading industry association, estimated that mobile money platforms collectively encompassed approximately 3.2 million of these local agents; *see* GSMA, “2015 State of the Industry: Mobile Financial Services for the Unbanked” (26 February 2016), available at <http://www.gsma.com>.

<sup>154</sup> *See* GSMA, “2014 State of the Industry: Mobile Financial Services for the Unbanked” (2 March 2015) at 5 and 16, available at <http://www.gsma.com>. Notably, this development echoes the establishment of the London Clearing House and other clearing houses in the context of bank-based payment systems; *see* Part 3. A ‘transfer’ of funds in an interoperable network of this kind appears to take effect by the customer instructing the provider to debit the customer's account (or ‘wallet’) and to take steps to credit (or enable another system provider to credit) a transferee with a claim of equivalent value (less any fees incurred), such that in legal terms there is not strictly a ‘transfer’ but rather the extinction of one claim and the creation of one or more new ones; *see* *ibid.* and n 8.

One of the first—and arguably most successful—mobile money platforms, M-Pesa, was launched by Safaricom in Kenya in 2007. By the beginning of 2016, there were more than 270 mobile money platforms, operating in 93 countries, with approximately 134 million active accounts.<sup>155</sup> In terms of geographic dispersion, by far the largest number of mobile money platforms are located in Sub-Saharan Africa, with Latin America and South and East Asia also contributing significantly to global growth in terms of the number of new platforms.<sup>156</sup> Given the large unbanked populations in many countries in these regions, mobile money is often presented as a promising means of promoting greater financial inclusion.<sup>157</sup>

The commercial viability of mobile money platforms such as M-Pesa turns on their ability to attract a critical mass of customers. Mobile money platforms are subject to pronounced network effects: with the attractiveness of a platform to potential customers depending on the number of existing customers within the network.<sup>158</sup> The viability of these platforms is also a function of the speed and cost of depositing and withdrawing cash—i.e. exchanging cash for e-money and vice versa—and transferring e-money to third parties.<sup>159</sup> The use of mobile phone technology makes transferring e-money relatively straightforward. It also helps ensure that the technology itself is widely disseminated amongst prospective customers. In the case of M-Pesa, Safaricom was then able to establish and entrench its platform by recruiting a large number of local agents, thus ensuring that customers were able to deposit and withdraw cash in a wide variety of locations across Kenya. These agents transact with M-Pesa customers on their own account, using a float of cash and e-money held in their own name to fund transactions.<sup>160</sup> When the cash or e-money component of an agent’s float is exhausted,

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<sup>155</sup> GSMA (2015) (n 160) at 6 and 7.

<sup>156</sup> *Ibid.* at 13.

<sup>157</sup> Indeed, the objective of promoting financial inclusion permeates the GSMA annual state of the industry reports; *see* GSMA (2015) (n 160) and (2016) (n 159).

<sup>158</sup> *See* David Evans and Alexis Pirchio, “An Empirical Examination of Why Mobile Money Schemes Ignite in Some Developing Countries But Flounder in Most” (2015 working paper) at 5. For a discussion of network effects generally, *see* Paul Klemperer, “Network Goods (Theory)”, in Steven Durlauf and Lawrence Blume (eds.), *The New Palgrave Dictionary of Economics* 2<sup>nd</sup> ed. (Palgrave Macmillan, New York, 2008).

<sup>159</sup> Evans and Pirchio (n 165). *See also* Janine Aron, “Leapfrogging: a Survey of the Nature and Economic Implications of Mobile Money” (2015 working paper) at section 9.1.

<sup>160</sup> As Colin Mayer and Michael Klein have emphasized, this means that agents do not perform the same function that a bank branch performs when it accepts deposits and offers withdrawals to its customers, for

the agent must seek to replenish its float by exchanging cash or e-money with another (typically larger) agent.<sup>161</sup> At the top of this chain are then a small number of large wholesale agents with whom Safaricom<sup>162</sup> transacts directly for the issue of new e-money or the conversion of existing e-money into cash or other funds.<sup>163</sup>

The reliance of mobile money platforms on networks of local agents, wholesale agents, and ultimately mobile phone companies to provide both storage and liquidity raises what should by now be a familiar question: how can these firms credibly commit to perform these functions during periods of institutional stress? As with crypto-currency exchanges and P2P payment systems, the provision of these functions outside the regulated banking system poses two principal risks. The first risk is that customers will experience delays in converting their e-money into cash during any bankruptcy process. To put this risk into perspective, the World Bank's 2016 *Doing Business* survey estimates that the average length of a corporate bankruptcy process in Sub-Saharan Africa—measured by reference to the time between default and the distribution to a senior secured creditor in full or partial satisfaction of their claim<sup>164</sup>—is approximately 3 years.<sup>165</sup> The second risk is that

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in doing so the branch acts on behalf of the bank; Michael Klein and Colin Mayer, “Mobile Banking and Financial Inclusion: The Regulatory Lessons” (May 2011, World Bank Policy Research Paper 5664) at 7-8.

<sup>161</sup> Frederik Eijkman, Jake Kendall, and Ignasio Mas, “Bridges to Cash: the Retail End of M-PESA” (2010), 2 *Savings and Development* 219.

<sup>162</sup> Or, more precisely, a trustee corporation in respect of which Safaricom acts as agent; *see* Part 6.

<sup>163</sup> Eijkman, Kendall, and Mas (n 168) at 224. Other than transactions between Safaricom and these highest level wholesale agents, transactions in this system do not appear to involve Safaricom directly, and (correspondingly) do not appear to involve the issue of new e-money or the redemption of existing e-money. Instead, system participants simply transfer e-money to each other in what appears to be an assignment of the contractual rights against Safaricom that a holder of e-money enjoys in exchange for cash.

<sup>164</sup> *See* World Bank, “Doing Business Survey – Resolving Insolvency Methodology”, available at <http://www.doingbusiness.org/methodology/resolving-insolvency#time>. The survey presents a hypothetical case involving an insolvent and illiquid incorporated debtor with a medium sized (hotel) business and one secured (bank) creditor, and invites participants to, *inter alia*, estimate the time from default to payment of some or all of the bank debt, assuming the commencement of bankruptcy or foreclosure proceedings.

<sup>165</sup> *See* World Bank, *Doing Business Report – Kenya* (2016), available at <http://www.doingbusiness.org/data/exploreconomies/kenya/#close>. Of course, where a customer enjoys an *absolute* proprietary interest, they may be able to access assets before secured creditors are able to enforce against them. This could include, for example, the circumstance where a customer enjoys a beneficial interest under a trust (*see* Part 6). Inevitably, however, there will be some delay while a customer's interest is verified. If there is any dispute as to the scope or validity of this interest, these delays may be significant: *see* for example, Robert Hantusch, “Trust Claims and Client Monies: Left High and Dry or Scooping the Pool?” (21 April 2010) at para. 14, available at [http://clients.squareeye.net/uploads/3sb/events/211010\\_hantusch.pdf](http://clients.squareeye.net/uploads/3sb/events/211010_hantusch.pdf). Reflecting on the *Farepak* litigation in the English courts, Hantusch observes: “It is instructive to note the extremely limited benefit that was received from even the successful trust claims in the *Farepak* case. In late 2009, 3 years after the

the entitlement to convert e-money into cash or other funds will be characterized as an unsecured claim in the bankruptcy process, with the effect that any customer funds received and retained by the debtor in exchange for the issuance of e-money would be available for distribution to the firm's general body of creditors—with whom customers would then be forced to compete.<sup>166</sup> In this respect, it is worth observing that the World Bank has estimated that the mean recovery rate in Sub-Saharan Africa for *secured* creditors is approximately 27.9 cents on the dollar.<sup>167</sup> On average, in other words, unsecured creditors of bankrupt firms in Sub-Saharan Africa receive *nothing* at the conclusion of the bankruptcy process.<sup>168</sup>

By far and away the most immediate risks stemming from the emergence of the shadow payment system are those that this system poses to customers. Looking forward, however, the continued growth of the shadow payment system may also pose potentially significant risks to economic and financial stability. These risks flow from three principal sources. The first stems from the prospect that large numbers of micro and small enterprises will come to rely on the shadow payment system as a conduit for working capital purposes: i.e. as an 'account' into which the day-to-day receipts of the business flow and out of which payments are made to creditors, suppliers, and employees.<sup>169</sup> The jurisdictions in which this is most likely to occur include many countries in Sub-Saharan Africa, South East Asia, and elsewhere, where the conventional banking systems have traditionally underserved the small business community.<sup>170</sup>

In the event that businesses were to use the shadow payment system in this way, there is a risk that the bankruptcy of one or more payment institutions would result in customer

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onset of insolvency and only after considerable costs had been incurred... [a distribution] was made in settlement of trust claims”.

<sup>166</sup> The holders of e-money would typically hold a bundle of contractual rights against the system provider, including the right to call for the convertibility of their e-money. In the event of breach by the system provider, these rights would entitle the customer to sue for damages or, depending on the nature of the relevant conversion rights, in debt. In either case, the customer would be ranked as an unsecured creditor and thus liable to compete (typically on a *pro rata* basis) with other such creditors.

<sup>167</sup> World Bank (n 172).

<sup>168</sup> Except insofar as they enjoy some preferential status vis-à-vis secured creditors.

<sup>169</sup> While medium-sized and larger enterprises could also theoretically be exposed to this risk, they are also likely to have more reliable access to both the conventional bank-based payment system and sources of credit enabling them to withstand any liquidity shock.

<sup>170</sup> See for example, Reserve Bank of India, *Report of the Committee on Comprehensive Financial Services for Small Businesses and Low Income Households* (7 January 2014), available at <https://rbidocs.rbi.org.in/rdocs/PublicationReport/Pdfs/CFS070114RFL.pdf> (describing the gap between the supply of and demand for financial services amongst small businesses in India).



funds being trapped within these institutions for the duration of the bankruptcy process—thereby starving these businesses of the working capital needed to pay creditors, suppliers, and employees. In addition to jeopardizing the solvency of these businesses, the knock-on effects stemming from the delayed repayment of creditors and suppliers could also jeopardize the solvency of a broader cross-section of firms within the real economy. Through this channel, institutional instability within the shadow payment system could generate significant negative externalities, ultimately leading to a contraction in economic activity and employment.

The second risk stems from the prospect that, as the shadow payment system continues to grow and evolve, the pressure to generate profits may drive institutions to bundle payment functions with more conventional forms of financial intermediation: combining their promise of transactional and custodial storage and liquidity to customers with investments in longer term and potentially illiquid assets. These pressures can already be observed in connection with the evolution of mobile money platforms, where governments and industry lobby groups have invested considerable time and effort in identifying ways to make platforms commercially sustainable.<sup>171</sup> PayPal, meanwhile, now offers a range of credit products to its customers.<sup>172</sup> It also invests customer funds in “highly liquid, highly rated instruments” not protected by deposit guarantee schemes.<sup>173</sup> As these and other institutions continue to expand into more conventional forms of financial intermediation, the resulting credit, maturity, and liquidity mismatches will introduce the risk of destabilizing runs by customers and other short-term creditors.

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<sup>171</sup> The pressures to make these platforms profitable is particularly evident in the output of the GSMA. For an overview of its policy work and resources in relation to the commercial aspects of mobile money, see [http://www.gsma.com/mobilefordevelopment/programmes/mobile-money?utm\\_source=Tile](http://www.gsma.com/mobilefordevelopment/programmes/mobile-money?utm_source=Tile). A representative example is the GSMA’s analysis regarding the commercial sustainability of so-called ‘payments banks’ in India: “To become profitable, payments banks will need to drive digital transactions through accounts at scale. However, unlike traditional mobile money players, it is unlikely that payments bank will be able to live off transaction revenues alone—and without a growing ecosystem and adjacent revenue streams (e.g., digital credit, micro insurance and merchant payments), the road to profitability will be difficult.”; GSMA, “The Business Case for Payments Banks in India (December 2016) at 6, available at <http://www.gsma.com/mobilefordevelopment>.

<sup>172</sup> For an overview of PayPal’s consumer credit products, see <https://www.paypal.com/us/webapps/mpp/paypal-credit>.

<sup>173</sup> See PayPal Holdings, Inc. Form 10 filed 9 April 2015 at F-14. For media commentary on this point, see Izabella Kaminska, “Is it a bank, a money transmitter, or a Silicon Valley shadow financier? No, it’s just PayPal!”, *FTAlphaville* blog (6 August 2015), available at <http://www.ft.com> and David Bergendahl, “Your PayPal balance isn’t FDIC insured: the case for a new model of financial startups”, *Medium* (21 September 2014), available at <http://www.medium.com>.

It is at this point that the stark differences in the legal and regulatory treatment of institutions within the conventional banking and shadow payment systems may become particularly salient. As we have seen, while the shadow payment system may appear to be an effective substitute to the conventional banking system, the unique prudential regulatory regimes to which banks are subject enhances the credibility of their commitment to perform their core storage and liquidity functions during periods of institutional or systemic stress. In effect, these regulatory regimes enhance the ‘moneyness’ of a bank’s deposits and other short-term liabilities relative to the otherwise functionally equivalent liabilities issued by institutions within the shadow payment system.<sup>174</sup> During periods of market turmoil or uncertainty, therefore, we might expect to observe pronounced outflows of customer funds from the shadow payment system and into the conventional banking system.<sup>175</sup> In jurisdictions where large numbers of customers do not have access to banks, meanwhile, we would likewise expect to observe spikes in the demand for the conversion of customer funds held within the shadow payment system into cold hard cash. Through this latter channel, correlated runs within the shadow payment system—in particular where the funds within this system are channelled into more conventional forms of financial intermediation—could conceivably lead to a broader contraction in the money supply, thereby driving a contraction in investment and economic growth.<sup>176</sup>

Finally, as an increasing proportion of customer funds become held by institutions outside the conventional banking system, there is a risk that this may undercut the ability of central banks to effectively manage the money supply. The three core policy tools that central banks currently use to manage the money supply are open market operations, reserve ratios, and the discount rate.<sup>177</sup> Open market operations involve the central bank

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<sup>174</sup> See discussion regarding the vulnerability of banks to destabilizing runs by depositors and other short-term creditors at 24.

<sup>175</sup> Ibid.

<sup>176</sup> For a description of how the correlated withdrawal of liquidity or failure of banks can precipitate a contraction in the money supply, see Friedman and Schwartz (n 20). For a modern formulation of this problem incorporating the shadow banking system, see Morgan Ricks, *The Money Problem: Rethinking Financial Regulation* (Chicago University Press, Chicago, 2016). Of course, the risk that the correlated failure of institutions within the shadow payment system would precipitate a material contraction in the money supply would ultimately hinge on the extent of the credit, maturity, and liquidity transformation taking place within these institutions (or the institutions into which funds are channelled) and the overall share of financial intermediation being performed within the shadow payment system.

<sup>177</sup> For an overview of how the Federal Reserve uses these and other tools, see Federal Reserve, *The Federal Reserve System: Purposes and Functions*, 10<sup>th</sup> ed. (October 2016) at 20-53. For an overview of the equivalent

buying and selling government debt securities from select banks and other financial institutions in order to expand or contract the money supply and, ultimately, influence prevailing market interest rates. Reserve ratios impose a minimum fraction of deposits that banks must hold in the form of cash or non-interest bearing central bank reserves, thus effectively limiting the proportion of a bank's short-term funding that it can use to make loans and other longer term investments.<sup>178</sup> Discount rates, meanwhile, represent the interest rates that central banks charge in connection with short-term loans to member banks. By raising (or lowering) the reserve ratio and discount rate, central banks can thus increase or decrease the supply of money and credit, thereby increasing (or decreasing) the cost of capital and stimulating (or dampening) the levels of investment and spending in the real economy. Importantly, these policy tools are designed for a world in which banks are the primary transmission mechanisms through which central banks seek to promote price stability, financial stability, and other policy objectives. In a world where the shadow payment system grew to rival or supplant the conventional banking system, we would thus expect this to undermine the ability of central banks to use existing monetary policy tools in pursuit of these important objectives.

Looking even farther into the future, there is the prospect of a shift to a digitized monetary system. In a digitized monetary system paper money would be replaced with electronic payment instruments linked to the conventional banking system.<sup>179</sup> Advocates of digitization point to two principal benefits. The first is that it would discourage tax evasion and organized crime, both of which rely on the anonymity of cash payments.<sup>180</sup> The second is that it would give central banks the flexibility to effectively implement monetary policy at—and even below—the point at which target interest rates reach zero per cent (the so-called ‘zero lower bound’).<sup>181</sup> The effect of negative interest rate policy is similar to a tax on deposited savings designed to stimulate investment. At present, one

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framework in the United Kingdom, *see* Bank of England, *Sterling Monetary Framework* (June 2015), available at <http://www.bankofengland.co.uk/markets/Documents/money/publications/redbook.pdf>.

<sup>178</sup> More recently, these reserve ratios have been supplemented by liquidity coverage ratios designed to ensure that banks hold a sufficient stock of high quality liquid assets to be able to meet expected outflows in the event of a hypothetical 30-day stress scenario; *see* Basel Committee on Banking Supervision, “Liquidity Coverage Ratio (LCR)” (January 2013), available at <http://www.bis.org/bcbs/basel3.htm>.

<sup>179</sup> *See* Rogoff (n 24) at (Rogoff's proposal envisions leaving a stock of small notes and coins in circulation for some significant period of time to address logistical concerns surrounding security, privacy, and emergencies. Rogoff also acknowledges the potential of distributed ledger technologies as a possible future substitute for the conventional bank-based payment system).

<sup>180</sup> *Ibid.* at 58-79.

<sup>181</sup> *Ibid.* at chapters 8-12.

of the practical challenges of imposing negative interest rates is that depositors can respond by simply withdrawing cash from the banking system and then hoarding it—thereby undercutting the stimulative impact of the policy and potentially undermining financial stability. By eliminating cash, a central bank could thus secure the unfettered ability to pursue negative interest rate policy without the corresponding risk of triggering widespread bank runs, a reduction in the money supply, and economic stagnation. Against this backdrop, the existence of a shadow payment system that served as an effective substitute for conventional deposit-taking banks—where depositors could avoid the impact of negative interest rates by shifting funds to PayPal, for example—would thus pose a clear threat to the effectiveness of central bank policy within a digitized monetary system.

At present, each of these potential systemic risks is somewhat speculative. The shadow payment system has simply not achieved the scale necessary to pose a clear and present danger to financial or economic stability. In Kenya, where mobile money has become an important part of the financial ecosystem, the total stock of e-money is still likely only a small fraction of the aggregate money supply.<sup>182</sup> The \$USD13 billion sitting in PayPal’s customer accounts is similarly only equivalent to approximately 1/10<sup>th</sup> of one per cent of FDIC insured bank deposits.<sup>183</sup> Moreover, few if any institutions within the shadow payment systems appear to currently engage in meaningful levels of credit, maturity, or liquidity transformation. Simultaneously, however, there was a time in the development of all important economic institutions when they were a relatively small, unimportant, and misunderstood curiosity. Perhaps more importantly, while these risks may not pose any immediate threat, identifying them at this early stage can enhance our understanding of how best to approach the design and regulation of this increasingly important component of the financial system.

Together, the case studies of Mt. Gox, PayPal, and M-Pesa provide us with important insights into the potential risks stemming from the simultaneous provision of storage and

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<sup>182</sup> Because payments are typically measured and reported in *flows*, whereas the money supply is inherently a *stock* measure, it is difficult to determine how big the e-money float is relative to the broader money supply. However, with Kenya’s current M2 money supply—which includes notes and coins, central bank reserves, and bank deposits—at over 2.3 trillion Kenyan Schillings (KES) (or 53,000 KES for every man, woman and child in the country), it seems highly unlikely that e-money is equivalent to anything more than a small fraction of the money supply.

<sup>183</sup> On the basis that the total value of U.S. dollar deposits insured by the FDIC was approximately \$USD11.3 trillion at the end of 2015; *see* <http://www.statista.com/statistics/193621/fdic-insured-commercial-bank-liabilities-through-deposits/>.

liquidity outside the perimeter of the regulated banking system. From the perspective of customers, these risks flow principally from the prospect of delayed repayment, along with the potential write-down of customer funds arising from their treatment as unsecured claims in the context of any bankruptcy proceeding. From a macroeconomic perspective, these risks flow from the potential knock-on effects stemming from the failure of one or more institutions within the shadow payment system, the prospect of destabilizing runs, and constraints on the ability of central banks to effectively manage the money supply. In the next section, we identify and examine the likely effectiveness of four strategies that have been, or might in future be, employed to address these risks. We also examine a fifth strategy—structural separation—that may ultimately provide a more effective means of addressing these risks without undercutting the perceived benefits of these systems and, thus, their potential desirability as substitutes for conventional bank-based payment systems.

## 6. REGULATING THE SHADOW PAYMENT SYSTEM

Having identified the risks stemming from the emergence and growth of the shadow payment system, we now turn our attention to the range of strategies that might be used to address them. This section examines four strategies drawn from those currently employed within various components of the shadow payment system: portfolio restrictions, private third party insurance, outsourcing the storage function to deposit-taking banks, and trusts. While these strategies are not without their prospective benefits, they each focus primarily on ensuring the secure *storage* of customer funds while neglecting to fully account for the impact of the application of corporate bankruptcy law on the credibility of the commitment to provide customers with *liquidity*. Perhaps unsurprisingly given the current size of the shadow payment system, these strategies also do very little, if anything, to address potential systemic risks. For these reasons, we go on to examine a fifth strategy—the structural separation of payment functions—as a potentially more desirable strategy for ensuring effective storage and liquidity during periods of institutional and systemic stress.

Rather than engaging in an in-depth evaluation of the institutional arrangements and regulatory regimes in specific jurisdictions, our examination proceeds on the basis of first principles—distilling these five strategies down to their fundamental features. We adopt this approach for several reasons. First, after over 800 years of reliance on bank-based payment systems (or informal payment systems in many emerging economies), the

shadow payment system represents a new frontier in institutional design and regulation. While several jurisdictions have proposed or adopted regulatory regimes targeting institutions within the shadow payment system, most of these regimes either attempt to shoehorn institutions into conventional banking regulation or give them extremely wide latitude to design institutional features that protect customers and mitigate potential systemic risks. An example of the former approach is the U.S. Office of the Comptroller of the Currency's proposed "Fintech Charter"<sup>184</sup>, while an example of the latter is the European Union's Payment Services Directive (PSD2).<sup>185</sup> Ultimately, the emergence of new institutions, posing new policy challenges, demands new and creative thinking. Second, as described in Part 5, there is enormous diversity in the business models of the institutions that comprise the shadow payment system. The same is true of the regulatory regimes to which they are currently subject. This diversity demands that our descriptions of the available strategies remain necessarily abstract. Third, each of the strategies examined in this section could theoretically be implemented by means of private contracting, industry self-regulation, public regulatory intervention, or some combination of the three.<sup>186</sup> We are agnostic at this time about which is likely to be most effective in practice and, intuitively, would expect the answer to depend heavily on the specific business models, along with the prevailing legal, political, and institutional environment.<sup>187</sup> Finally, as stated at the outset, our primary objective in identifying these strategies is not to determine which is likely to be most socially desirable—either relative to each other or in relation to the regulatory strategies governing conventional bank-based payment systems. Instead, our principal objective is simply to evaluate whether these strategies are likely to effectively address the risks stemming from the bundling of storage and liquidity functions outside the perimeter of the regulated banking system and, where necessary, to identify potential tradeoffs.

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<sup>184</sup> See Office of the Comptroller of the Currency, "Exploring Special Purpose National Bank Charters for Fintech Companies" (December 2016), available at <http://www.occ.gov>. This proposal specifically seeks to incorporate fintech businesses involved in the payments industry.

<sup>185</sup> Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC, Art. 10(1)(a).

<sup>186</sup> For a discussion of network governance models, see Bruce Summers and Kristin Wells, "Governance of Payment Systems: A Theoretical Framework and Cross-country Comparison" (2014), 3:2 *Journal of Financial Market Infrastructures*.

<sup>187</sup> The obvious exceptions are measures designed specifically to address potential systemic risks, where we would expect to observe underinvestment by private industry participants.

*(a) Do Nothing*

Any thorough examination of the universe of available policy alternatives must necessarily begin with an evaluation of the consequences of doing nothing.<sup>188</sup> In this context, ‘doing nothing’ essentially involves the decision not to adopt any measures designed to enhance the credibility of a shadow payment system’s commitment to continue to perform its core storage and liquidity functions in the event of bankruptcy, thereby passing the risk of illiquidity and loss of value on to its customers and generating potential systemic risks. This strategy is considerably more than a stalking horse for other more realistic or attractive alternatives. It was the strategy implicitly adopted by Mt. Gox. It is also the strategy more consciously and—to its credit—transparently adopted by PayPal in the United States and United Kingdom. From the perspective of the shadow payment system and its customers, the short-term benefits of this strategy stem from the potential cost savings relative to the other more interventionist strategies described below, along with the possibility of using customer funds as an additional source of investment capital and revenue. Inevitably, however, these benefits must be weighed against both the direct costs to customers in the event of an institution’s bankruptcy, along with the potential externalities stemming from the inability of customers to pay creditors, suppliers, and employees. Where doing nothing foments potential systemic risks, the resulting costs to society would of course also need to be taken into consideration.

*(b) Portfolio Restrictions*

One frequently identified strategy for protecting shadow payment system customers is the imposition of portfolio restrictions. Portfolio restrictions impose limits on the types of assets in which shadow payment systems can invest customer funds, typically restricting them to cash and low risk, highly liquid securities. For example, mobile money platforms in many jurisdictions are required to maintain a 1:1 ratio of deposit liabilities to liquid assets available to fund customer conversion demands.<sup>189</sup> These requirements are then often combined with a prohibition against comingling customer

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<sup>188</sup> This follows from the Coasian observation that the costs of intervention may ultimately outweigh the resulting benefits; see Ronald Coase, “The Problem of Social Cost” (1960), 3 *Journal of Law and Economics* 1.

<sup>189</sup> See for example, Kenya, National Payment Systems Regulations (2014) under the National Payment Act, No. 39 (2011), Articles 25 and 45.

funds with the firm's other assets.<sup>190</sup> In Europe, the PSD2 similarly identifies investments in “secure, liquid low-risk assets” as one of three possible mechanisms by which regulated “payment institutions” are permitted to safeguard customer funds.<sup>191</sup>

Portfolio restrictions are designed to ensure that shadow payment systems maintain a sufficient stock of highly liquid assets that can be used to fund customer conversion demands, thereby ensuring that these demands do not themselves trigger firm-level liquidity problems—i.e. runs. In this respect, portfolio restrictions can be viewed as reducing the marginal probability of institutional distress and bankruptcy. On their own, however, these restrictions do little to ameliorate the negative repercussions for customers in the event that other aspects of a firm's business—its mobile phone operations, for example—drive it into bankruptcy. Absent other complimentary strategies, these assets will still form part of the bankrupt firm's estate. As a result, customers will still be vulnerable to the risks of illiquidity and loss of value stemming from the bankruptcy process. Importantly, by limiting the range of assets in which institutions are permitted to invest, portfolio restrictions also constrain the ability of these institutions to use customer funds as a foundation for engaging in other socially useful forms of financial intermediation.

### *(c) Private Third Party Insurance*

A second frequently identified strategy for protecting customers is the provision of insurance by an independent third party. The New York State Department of Financial Services Virtual Currency Regulation, for example, identifies a surety bond as one of the mechanisms that licensed crypto-currency exchanges can utilize to protect customer funds.<sup>192</sup> The PSD2 similarly envisions that payment institutions may protect customer funds by way of an insurance policy or guarantee from a non-affiliated bank or insurance company, payable to customers in the event that the institution is unable to meet its financial obligations.<sup>193</sup> In the United Kingdom, customers would also potentially receive

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<sup>190</sup> Ibid., Article 25. As described in greater detail below, this prohibition often results in the use of piggy banking strategies.

<sup>191</sup> The other two strategies—third party insurance and piggy banking—are discussed in greater detail below.

<sup>192</sup> New York Department of Financial Services, Regulations, Title 23, Chapter 20, Article 200.9(a). As a substitute, a licensed exchange can also maintain a trust account with a third party custodian (*see* discussion regarding trust accounts below).

<sup>193</sup> Ibid., Article 10(1)(b).



(inadvertent) protection under section 75 of the Consumer Credit Act, which renders credit card companies joint and severally liable in the event that a supplier is unable to honor its contractual commitments.<sup>194</sup> Thus, PayPal customers who funded their accounts using their credit card and were subsequently prevented from converting or transferring those funds could conceivably seek redress from their credit card company—in effect rendering the credit card company a third party guarantor of PayPal’s contractual obligations.<sup>195</sup> Ultimately, the rationale for the provision of third party insurance in this context is to ensure that there is a party contractually obligated to provide customers with liquidity in the event that an institution within the shadow payment system is unable to do so by virtue of, for example, the strict application of corporate bankruptcy law. In this respect, this strategy can be understood as a form of *private* deposit guarantee scheme.

In theory, private third party insurance can help insulate customers from the illiquidity and loss of value stemming from a shadow payment system’s bankruptcy. Intuitively, however, the effectiveness of this insurance is likely to depend on the probability of correlated bankruptcy or default by the shadow payment system and private insurer. This joint probability of default is likely to be a function of at least two variables. The first is the *size* of the shadow payment system as measured by the quantum of insured customer funds relative to the resources of the insurer. The larger the system, the more likely that its bankruptcy will place demands on the insurer that might threaten its own liquidity and, ultimately, solvency. The second is the *interconnectedness* of the shadow payment system with the broader financial system. The higher the level of interconnectedness, the higher the probability that the shadow payment system and insurer will simultaneously come under pressure in the context of a more *systemic* liquidity crisis. Accordingly, as the size and interconnectedness of shadow payment systems increases, we would expect a corresponding decrease in the credibility of the private insurer’s commitment to provide the necessary liquidity insurance. This, in turn, highlights the comparative advantage of sovereign governments—given their large balance sheets, the absence of binding solvency or liquidity constraints, and the legal authority to print money—as credible providers of emergency liquidity assistance during

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<sup>194</sup> See Consumer Credit Act 1974, c. 39 (as am.), section 75. Section 75 places a number of conditions on the right to seek redress. To our knowledge, section 75 has not been employed to seek redress against a supplier that would fall under the definition of a shadow payment system.

<sup>195</sup> Although in this example it seems doubtful that customers would be using PayPal for the purposes of custodial storage.

periods of broader financial instability. It also highlights the potential Achilles' heel of this strategy: the bigger the shadow payment system becomes, the less effective we would expect third party insurance to be as a mechanism for protecting consumers or insuring against the materialization of potential systemic risks.

#### (d) Piggy Banking

The term “piggy banking” refers to a third range of strategies pursuant to which institutions within the shadow payment system outsource the custodial storage function to conventional deposit-taking banks, thereby piggy backing off the prudential regulatory strategies described in Part 4. There are at least two types of piggy banking strategies. The first—*intermediated*—strategy involves the storage of customer funds in an omnibus bank account held in the name of the shadow payment system. This first strategy is expressly envisaged by the PSD2 as one of the mechanisms by which payment institutions can protect customer funds.<sup>196</sup> It also appears to be the strategy employed by several mobile money platforms.<sup>197</sup> The second—*direct holding*—strategy involves the storage of customer funds in bank accounts held directly in the name of customers. This second strategy, which is the essence of bank-based P2P payment systems, effectively moves customer funds out of the shadow payment system and into the conventional banking system.

The potential benefits of piggy banking flow from the prudential regulatory regimes governing deposit-taking banks. As we have seen, these regimes include deposit guarantee schemes designed to protect depositor funds and provide them with liquidity during periods of institutional stress, along with emergency liquidity assistance facilities and special resolution regimes designed to prevent or contain potential systemic risks. For these reasons, direct holding strategies pose relatively few risks to customers beyond the narrow case where a shadow payment system is in the zone of, or enters into, bankruptcy during any period of time after funds have entered the system but before they have been safely deposited in the customer’s bank account.<sup>198</sup>

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<sup>196</sup> PSD2, Article 10(1)(b).

<sup>197</sup> See for example, Kenya, National Payment Systems Regulations (2014), Article 25(3)(f). See more generally, GSMA, “Mobile Money Regulatory Guide – Ringfencing and Safeguard of Customer Money”, available at <http://www.gsma.com/mobilefordevelopment/programmes/mobile-money/safeguard-of-customer-money>, Table 1 and Jono Greenacre and Ross Buckley, “Using Trusts to Protect Mobile Money Customers” (2014), Singapore Journal of Legal Studies 59 at [page 10 working paper].

<sup>198</sup> Although where customers do not have easy access to banking services—as is the case with money mobile money customers—this may still cause problems.

However, where customer funds are comingled in a bank account held in the name of the shadow payment system itself, customers may still be exposed to a number of potentially significant risks. First, insofar as the customer's contract is with the shadow payment institution and not the bank, customers may find it difficult to secure timely access to their funds in the event of the institution's bankruptcy. This may be particularly problematic where the bank has taken security over the funds in these accounts. Second, in the event that the bank were to fail, it is not necessarily clear that the shadow payment system or its customers would be adequately protected. Many deposit guarantee schemes, for example, are capped at relatively low levels and may not apply to commercial deposits. In recognition of this risk, Kenya, for example, recently proposed an amendment to its deposit insurance scheme that would provide pass-through protection to mobile money customers.<sup>199</sup>

More broadly, piggy banking strategies may distort the competitive structure of the payment system. To the extent that institutions within the shadow payment system come to rely on banks to perform core functions, this places banks in an advantageous position to influence the development of what are, in effect, emerging competitors in the payments industry. Perhaps most importantly, these strategies run the risk of embedding bank accounts as largely non-substitutable intermediate products, thus exposing shadow payment institutions to potentially acute hold-up problems.<sup>200</sup> Under these circumstances, we might expect banks to extract most of the commercial benefits generated by piggy banking strategies. Over the longer term, meanwhile, we might expect to see high levels of vertical integration: with banks acquiring shadow payment institutions and integrating them into their existing business lines.<sup>201</sup> This outcome would be problematic insofar as we think that banks are poor incubators for socially desirable financial innovation. It would also be problematic insofar as one of the reasons for the emergence of mobile money platforms, for example, was an engrained distrust of the conventional banking system.

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<sup>199</sup> See Kenyan Deposit Insurance Act (2012), No 10, Article 29. Although, as examined in the next section, this protection may ultimately prove illusory.

<sup>200</sup> See Oliver Williamson, "Transaction Cost Economics: The Governance of Contractual Relations" (1979), 22:2 *Journal of Law and Economics* 233.

<sup>201</sup> *Ibid.*

*(e) Trust in Trusts*

Perhaps the most frequently identified strategy for protecting customer deposits within the shadow payment system—and especially mobile money platforms—is the use of trusts. Trusts are used to partition assets in a wide range of commercial contexts.<sup>202</sup> As Jonathan Greenacre and Ross Buckley explain in the context of mobile money platforms, trusts can be used to ring-fence customer funds, thereby rendering them unavailable for distribution to creditors in the event of a firm’s bankruptcy.<sup>203</sup> In the case of mobile money platforms, institutions performing payment functions could declare themselves a trustee over funds received in exchange for e-money, with the funds then held for the benefit of customers and thus available to meet their demands for convertibility even in the event of the institution’s bankruptcy.<sup>204</sup>

In order for this strategy to be effective, the trust must be validly constituted as a matter of general law.<sup>205</sup> On this point, some jurisdictions may require the segregation of customer funds so that they are not commingled with the assets of the institution performing payment functions.<sup>206</sup> The trust must also be respected under applicable corporate bankruptcy law. The most obvious basis on which an otherwise valid trust would *not* be respected in bankruptcy proceedings is where the trust’s creation is contrary to the relevant transaction avoidance rules. Where the trust is created by a declaration on the part of the institution to the effect that it holds funds on trust for e-money holders, there may be some risk that the declaration will be susceptible to avoidance as a

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<sup>202</sup> See John Langbein, “The Secret Left of the Trust: The Trust as an Instrument of Commerce” (1997), 107 Yale Law Journal 165 at 179.

<sup>203</sup> Greenacre and Buckley (n 204) at [page 17 working paper]. Under English law, assets held by a bankrupt debtor on trust for others are treated as assets unavailable for distribution to creditors in the event of the debtor’s bankruptcy, for the reason that they are owned beneficially—that is, in equity though not in law—by the beneficiaries of the trust; see Roy Goode, *Principles of Corporate Insolvency Law*, 4<sup>th</sup> ed. (Sweet & Maxwell) at 212-213.

<sup>204</sup> Greenacre and Buckley (n 204) at [page 17 working paper].

<sup>205</sup> There is of course an *a priori* question as to whether a ‘trust’ (or an equivalent mechanism, under which assets held by a debtor can be validly ring-fenced from creditors) is available at all under the applicable law.

<sup>206</sup> The position under English law on this question has arguably been relaxed by a series of recent decisions arising out of the Lehman bankruptcy; for a summary, see *Levin on Trusts*, 19<sup>th</sup> ed. (Sweet & Maxwell, London, 2015) at 34-040. Whether the same approach would be taken in other common law systems, or (for trusts or functionally equivalent mechanisms) in civil law systems, is an open question; see for example, Dorothy Gruyaert and Sander van Loock, “UK Supreme Court Decision on Lehman Brothers Client Money: Equity or Lottery?” (2014), 2 European Review of Private Law 217.

preference,<sup>207</sup> since the effect of the declaration is to convert the position of e-money holders from that of creditors to that of absolute (equitable) owners.

One potential solution to this problem is to ensure that cash received in exchange for the issue of e-money never becomes the beneficial property of the institution: i.e. it is at all times held on trust for customers. In the case of M-Pesa, this appears to have been achieved by a more sophisticated trust arrangement than that which could have been achieved by a simple declaration of trust by the system provider, Safaricom. Under this arrangement, liquid assets equivalent to the total stock of outstanding M-Pesa are held on trust not by Safaricom, but by a separately incorporated corporation, M-Pesa Holding Co. Limited. Safaricom then transacts with upper-tier agents in connection with the issuance and redemption of M-Pesa *as agent for the trustee corporation* rather than on its own account<sup>208</sup>, with the effect that all funds received are impressed with the trust from the outset.

Importantly, while a trust may be effective in shielding assets from the creditors of a shadow payment institution, this will not in itself be sufficient to ensure that these assets can be made available quickly to the trust's beneficiaries in the event of the institution's bankruptcy. Put differently: while trusts may be an effective strategy for ensuring the *storage* of customer funds<sup>209</sup>, they are unlikely in and of themselves to ensure that customers have adequate *liquidity* during any bankruptcy process. There will be a particular risk of delay where the shadow payment institution is itself the legal owner of the assets held in trust for its customers. In many jurisdictions, the effect of the commencement of bankruptcy proceedings is that the debtor's managers are displaced, or at least restrained from exercising their management powers. In their place, a bankruptcy practitioner may be appointed to marshal and preserve the debtor's assets

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<sup>207</sup> See for example, *Re Farepak Food and Gifts Ltd (in administration)* [2007] 2 BCLC 1 (*cf Re Kayford Ltd (in liquidation)* [1975] 1 WLR 279). The declaration will only be susceptible to avoidance as a preference if it is made at the relevant time prior to the commencement of bankruptcy proceedings: i.e. during the period of time governed by the applicable preference rule. There is considerable variation across jurisdictions on the length of this 'suspect period': see for example, Bob Wessels, Bruce Markell, and Jason Kilborn, *International Cooperation in Bankruptcy and Insolvency Matters* (Oxford University Press, New York, 2009) at 24. The other elements of the applicable preference rule must also be satisfied. These may include a requirement that the debtor is bankrupt at the time of, or in consequence of, making the declaration.

<sup>208</sup> Trust Deed entered into between M-Pesa Holding Co. Limited and Safaricom Limited on 19 June 2008, available at [http://www.safaricom.co.ke/images/Downloads/Personal/M-PESA/deed\\_of\\_amendment\\_to\\_declaration\\_of\\_trust\\_-\\_mpesa\\_account\\_holders.pdf](http://www.safaricom.co.ke/images/Downloads/Personal/M-PESA/deed_of_amendment_to_declaration_of_trust_-_mpesa_account_holders.pdf) and, specifically, clause 7.1(a).

<sup>209</sup> Assuming, of course, that the trust assets are properly preserved, and that the cost of the administration of these assets in the event of bankruptcy are either not significant or not borne by the trust beneficiaries.

and exercise powers of management and sale. The applicable corporate bankruptcy law may well recognize the substantive entitlement of beneficiaries to look (to the exclusion of all others) to assets held on trust for them by the debtor, but it may also impose a range of procedural obstacles to the exercise of beneficiary entitlements while the bankruptcy process is pending. The most obvious of these is a stay or moratorium on enforcement action. Yet even where the interests held under a trust are not subject to a stay or moratorium, beneficiaries are likely to suffer delays while the bankruptcy practitioner confirms the existence of a valid trust, along with the identity and entitlements of beneficiaries.<sup>210</sup> Moreover, the costs of the bankruptcy practitioner's work in doing so may be chargeable to trust assets.<sup>211</sup> Again, the M-Pesa trust arrangement offers a possible solution to this problem. As described above, Safaricom is *not* the trustee of the assets representing funds received in exchange for the issue of M-Pesa. Instead, a separately incorporated entity performs this function. This structural separation should avoid the risk that the bankruptcy of Safaricom could delay the distribution of trust assets to M-Pesa customers.<sup>212</sup>

#### (f) Structural Separation

The structure of M-Pesa points to a final and seemingly neglected strategy that institutions within the shadow payment system might employ to protect customers: *structural separation*. While structural separation could take many forms, the basic idea is that core payment functions would be performed by a dedicated bankruptcy remote legal entity, thereby ring-fencing customer funds from any distribution of assets to other creditors in the event of the parent firm's bankruptcy. This entity could then be subject to basic forms of prudential regulation including, for example, portfolio restrictions,

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<sup>210</sup> Once again, in the event that these issues are disputed the resulting delays may be significant. As the Financial Conduct Authority (FCA) observed in its post-Lehman review of the operation of the client assets sourcebook regime in the United Kingdom, there may be a trade-off between making a distribution speedily and making an accurate distribution; FCA, *Review of the Client Assets Regime for Investment Businesses* (Consultation Paper, July 2013) 1.16. See also Jo Braithwaite, "Law After Lehman", LSE Working Paper 11/2014 (24 February 2014) at 15.

<sup>211</sup> See *Re Berkeley Applegate (Investment Consultants) Ltd (No 2)* [1989] BCC 803. *Re Berkeley Applegate* turned on the construction of the remuneration rules for English liquidation proceedings, but has been applied by analogy in other forms of English insolvency proceedings. The approach to this question varies across common law jurisdictions; see for example the review of Australian authorities in *Re AAA Financial Intelligence Ltd (in liquidation) ACN 093 616 445* [2014] NSWSC 1004 at [13].

<sup>212</sup> A possible alternative, one in fact contemplated by the proposed Kenyan regulations, is to allow the government to step into the shoes of the trustee. However, this may be less attractive than structural separation insofar as the trustee is the debtor, as there will be negotiations between the bankruptcy practitioner appointed and the government over the proper conduct of the latter's affairs and the distribution of its assets.

private third party insurance, or mandatory trusteeship. It could also be subject to prudential regulation and supervision by public regulatory authorities.

Structural separation can be viewed as potentially superior to other strategies for protecting customer funds in at least three respects. First, where a firm performs core payment functions in combination with other business activities, structural separation eliminates the need for customers, other creditors, or prudential supervisors to monitor these other aspects of the firm's business. It also makes it more straightforward to impose other prudential regulatory strategies without unnecessarily impacting on the firm's other activities. Second, because the ring-fenced entity would be able to continue to meet its commitments in the event of its parent's bankruptcy, customers would face little or no risk of illiquidity or loss of value. As a result, there would also be little or no risk of destabilizing runs or externalities stemming from the inability of customers to pay creditors, suppliers, or employees. Finally, unlike putting our trust in trusts, there is limited risk of *ex post* avoidance claims under corporate bankruptcy law. Structural separation is thus likely to be more effective than trusts as a means of partitioning assets. Together, these features enhance certainty for customers and promote greater confidence in the credibility of these institutions' commitment to provide storage and liquidity during periods of institutional and systemic stress. Importantly, however, these benefits come at a cost. Like portfolio restrictions, the ring-fencing of customer funds envisioned by structural separation necessarily limits the ability of institutions to engage in other socially useful forms of financial intermediation.

This survey of available strategies reveals a number of potentially significant tradeoffs. First, while private law strategies based on contract and trusts are likely to give market participants the most flexibility in designing and updating institutional arrangements in response to market developments—thereby fostering financial innovation—these strategies are particularly vulnerable to the strict application of corporate bankruptcy law. Second, while strategies that rely on conventional banks and bank regulation may offer a high level of protection to customer funds and insulate the shadow payment system from potential systemic risks, these strategies run the risk of stifling innovation and competition within the payments industry. Third, many of the strategies that are likely to prove most effective in protecting customer funds and ensuring liquidity during periods of institutional stress—e.g. portfolio restrictions and structural separation—constrain the ability of institutions within the shadow payment system to use these funds to make

loans and other longer term investments in the real economy. These tradeoffs drive home the reality that there are no free lunches in finance—and thus in the design and regulation of the shadow payment system.

## 7. CONCLUSION

When scholars and policymakers examine the functions, operations, and regulation of modern payment systems they often take for granted that the institutional structure of these systems is deeply intertwined with the conventional banking system. One of the most important—and least appreciated—implications of this historical intertwining is that the unique prudential regulatory regimes governing banks generate important benefits for the stability of bank-based payment systems. Most importantly, the practical effect of these regimes is to relax the strict application of general corporate bankruptcy law, thereby enabling banks and bank-based payment systems to continue to perform their important economic functions under conditions of severe institutional stress.

The recent emergence of payment systems that reside outside the perimeter of the regulated banking system thus raises an important question: how credible is the commitment of these institutions to continue to perform their core payment functions under the same conditions? This paper has started the process of mapping the diverse range of institutional arrangements that make up this shadow payment system. It has identified the risks that this system poses to customers, along with the risks it may in future pose to financial and economic stability. It has also examined the effectiveness of some of the strategies that might be used to strengthen the credibility of this system's commitment to provide storage and liquidity during periods of institutional and systemic stress. This examination suggests that while these strategies may provide some degree of protection, there is considerable scope for further improvement. It also suggests that we have only just started to understand how the shadow payment system works, how resilient it is likely to be under stress and, thus, how effective it may prove as a potential substitute for conventional bank-based payment systems.