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MAPPING THE SHADOW PAYMENT SYSTEM

DAN AWREY

KRISTIN VAN ZWIETEN

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Mapping the Shadow Payment System

*Dan Awrey and Kristin van Zwieten**

Recent years have witnessed the emergence and rapid growth of a large, diverse, and constantly evolving shadow payment system. The shadow payment platforms (SPPs) that populate this system perform many of the same core payment functions as conventional deposit-taking banks: including custody, funds transfer, and liquidity. The crucial difference is that SPPs operate outside the perimeter of bank regulation, thereby depriving customers of the deposit guarantee schemes, lender of last resort facilities, special resolution regimes, and other legal protections typically enjoyed by bank depositors. This paper represents the first attempt to map the global shadow payment system and identify what mechanisms, if any, SPPs use to protect their customers. Examining the business models and customer contracts of over 100 SPPs, we find that it is often difficult to ascertain information essential to evaluating levels of customer protection and, where such information is available, that customers generally enjoy relatively limited structural, contractual, or other private legal protections. This puts enormous pressure on public regulatory frameworks to ensure a sufficient level of consumer protection. Regrettably, we also find that the applicable regulatory frameworks in several key jurisdictions often provide a level of protection that is far below that enjoyed by bank depositors. These findings suggest that, at least from a consumer protection perspective, SPPs are currently not an effective substitute for bank-based payment systems.

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* Dan Awrey is a Professor of Law at Cornell Law School. Kristin van Zwieten is the Clifford Chance Associate Professor of Law at the University of Oxford and a Fellow of Harris Manchester College. This research has been supported by a grant from the SWIFT Institute. All errors remain our own.

Introduction

For centuries, payment systems have been legally and operationally intertwined with the conventional banking system. Banks accept deposits from individuals, households, and firms looking to save money for a rainy day, earn interest on it, or perhaps simply protect it from loss, theft, or destruction. These deposits are credited to bank accounts that serve as the administrative and technological backbone of a complex network architecture that facilitates the transfer of funds between these individuals, households, and firms in satisfaction of their financial obligations. And, completing this virtuous circle, these deposits then serve as by far and away the largest source of money within most modern economies.¹

These core payment functions reflect a deceptively simple promise by a bank to hold, transfer, and convert deposited funds into cash on demand. So what makes this promise credible? And why do we think banks can make this promise more credibly than other firms? While scholars have long sought to answer this important question, an important piece of the puzzle is undoubtedly bank *regulation*. As a starting point, banks are subject to prudential regulation and supervision designed to minimize the probability and potential impact of their insolvency.² Banks also benefit from lender of last resort facilities designed to provide them with financial support during periods of institutional distress, along with deposit guarantee schemes and special resolution regimes designed to ensure that their commitments to depositors are honoured in the event of their insolvency.³ This unique and incredibly sophisticated regulatory architecture thus serves to insulate banks from the full force of general corporate insolvency law: making their promise to hold, transfer, and convert deposited funds more credible, and giving them a comparative advantage over other firms in providing core payment functions.

¹ In the United States, for example, roughly 75% of the total money supply is in the form of demand deposits held with domestic commercial banks; see Federal Reserve System, H.3 *Aggregate Reserves of Depository Institutions and the Monetary* (2019), <https://www.federalreserve.gov/releases/h3/current/h3.pdf> and Federal Reserve System, H.8 *Assets and Liabilities of Commercial Banks in the United States* (2019), <https://www.federalreserve.gov/releases/h8/current/h8.pdf>. The Federal Reserve also publishes weekly “Money Stock Measures” (H.6) that report slightly different figures.

² For a detailed description of these capital, liquidity, and other regulatory requirements, see John Armour, Dan Awrey, Paul Davies, Luca Enriques, Jeff Gordon, Colin Mayer & Jennifer Payne, *PRINCIPLES OF FINANCIAL REGULATION* (2016), ch. 13-15 and 17.

³ For a description of these mechanisms, see Armour et al., *supra* note 2, ch. 15-16.

Despite this significant comparative advantage, recent years have witnessed the emergence and rapid growth of a large, diverse, and constantly evolving *shadow* payment system.⁴ The shadow payment platforms (SPPs) that populate this system perform many of the same core payment functions as conventional deposit-taking banks: including custody, funds transfer, and liquidity. These SPPs include peer-to-peer (P2P) payment systems such as PayPal and Alipay, mobile money platforms such as M-Pesa, and cryptocurrency exchanges such as BitMax and Binance. The defining feature of these SPPs is that they operate outside the perimeter of conventional bank regulation. As a result, their customers do not benefit from the prudential regulation and supervision, lender of last resort facilities, deposit guarantee schemes, special resolution regimes, or other legal protections typically enjoyed by bank depositors.

This paper represents the first attempt to map this global shadow payment system. This mapping exercise spans three dimensions. First, we construct a taxonomy of different types of SPPs based on their underlying business models. This taxonomy divides SPPs into six categories: proprietary and bank-based peer-to-peer (P2P) payment systems; money remittance platforms; mobile money platforms, and centralized and decentralized cryptocurrency exchanges.⁵ While there is inevitably some overlap between these categories, this taxonomy enables us to better understand what these platforms do, how they differ, and—ultimately—the risks they pose to their customers. Second, we identify what we believe to be the largest SPPs in each category.⁶ Third, we map out the basic contours of the legal geography of the shadow payment system: identifying as best we can where SPPs are domiciled, the laws governing their customer contracts, and the regulatory frameworks to which they are subject. Importantly, our intention in constructing this map is not to paint a complete or definitive picture of the size, shape, or structure of this rapidly evolving system. Instead, our somewhat more modest ambition is simply to provide a baseline—however incomplete—for measuring its growth and evolution over time.

⁴ This has arguably coincided with something of a retreat by banks from the payments sector; see “Terminal Velocity: FIS’s \$43 Billion Takeover of Worldpay”, *The Economist* (23 March 2019), <https://www.economist.com/finance-and-economics/2019/03/23/fiss-43bn-takeover-of-worldpay>.

⁵ This taxonomy builds on and revises our earlier theoretical work on the shadow payment system; see Dan Awrey and Kristin van Zwieten, *The Shadow Payment System*, 43:4 J. CORP. L. 775 (2017).

⁶ A description of our search strategy is set out in the Appendix.

Importantly, this mapping exercise also enables us to begin to measure the level of consumer protection within the shadow payment system. While SPPs expose their customers to a variety of different risks, arguably the most important risk is that a platform will fail to perform core payment functions due to its default or insolvency. In theory, SPPs can protect their customers against this risk in a variety of different ways. Perhaps most fundamentally, SPPs can structure their business models to minimize potential credit risks. Thus, for example, platforms can elect not to hold customer funds or to only hold them for a very limited period of time. SPPs can also use mechanisms such as portfolio restrictions that limit their ability to take risks with deposited funds, or ring fence them from other creditors in separately capitalized subsidiaries. Lastly, SPPs can use disclosure, trusts, or other private law mechanisms to either warn customers of the relevant risks or afford customers a degree of protection against them.

To varying degrees, these private law mechanisms can make the promises of SPPs to perform core payment functions more credible, thereby enhancing consumer protection, and making these platforms more effective substitutes for bank-based payment systems. By the same token, each of these mechanisms entail potentially significant trade-offs. Most importantly, almost all of these mechanisms constrain the ability of SPPs to profit from the intermediation of customer funds. Intuitively, therefore, we might expect these costs to undercut the widespread adoption of these mechanisms. This intuition finds support in our examination of the business models and contracts of over 100 SPPs, where we find that customers generally enjoy relatively limited structural, contractual, or other private legal protections.

The failure of many SPPs to utilize these private law mechanisms puts enormous pressure on public regulatory frameworks to ensure a sufficient level of consumer protection. These frameworks range from antiquated money transmission laws adopted before the advent of the internet, to ostensibly cutting-edge regulation adopted in response to the New Wild West of Bitcoin and other cryptocurrencies. On their face, these frameworks borrow heavily from private law: utilizing mechanisms such as disclosure, portfolio restrictions, and statutory trusts. Nevertheless, our examination of these regulatory frameworks in several key jurisdictions reveals that SPP customers are often afforded a level of protection that is far below that typically enjoyed by bank depositors.

These findings have several important policy implications. First, perhaps not surprisingly, there is currently a high degree of heterogeneity in the business models and customer contracts of SPPs. There are also important differences in the regulatory frameworks that govern them across jurisdictions. As a result, different SPPs, operating in different jurisdictions, under different legal frameworks, may pose very different risks. Second, in general, the relatively low level of protection available to customers suggests that SPPs should not yet be viewed as effective substitutes for bank-based payment systems. Third, as the line between conventional deposit-taking banks and SPPs continues to blur, there is a very real risk that customers will migrate to these platforms—only to find that SPPs are unable to perform core payment functions during periods of institutional distress or insolvency. The widespread realization that the commitments of SPPs are not credible under these conditions is likely to be reflected in pronounced outflows of funds from SPPs to conventional deposit-taking banks during periods of institutional or systemic stress.

This paper proceeds as follows. Part I describes the core functions of modern payment systems, along with the essential promise at the heart of these systems to hold, transfer, and convert funds into cash on demand. Part II explains how the unique regulatory frameworks governing conventional deposit-taking banks serve to enhance the credibility of this commitment, giving banks a comparative advantage over other firms in providing core payment functions. Part III maps the emerging shadow payment system: identifying different categories of SPPs, the largest SPPs in each category, and the jurisdictions in which these SPPs are domiciled and regulated. Part IV then reports the findings of our examination of the business models and customer contracts of these SPPs, along with the applicable regulatory frameworks in several key jurisdictions. Part V concludes by discussing some of the key policy implications of our findings. Paramount amongst these implications is that, at least from a consumer protection perspective, SPPs are currently not an effective substitute for bank-based payment systems. This highlights the need for functionally equivalent regulation of the shadow payment system in order to promote consumer protection, level the competitive playing field, and prevent destabilizing outflows of funds during periods of institutional or wider financial instability.

I. The Core Functions of Modern Payment Systems

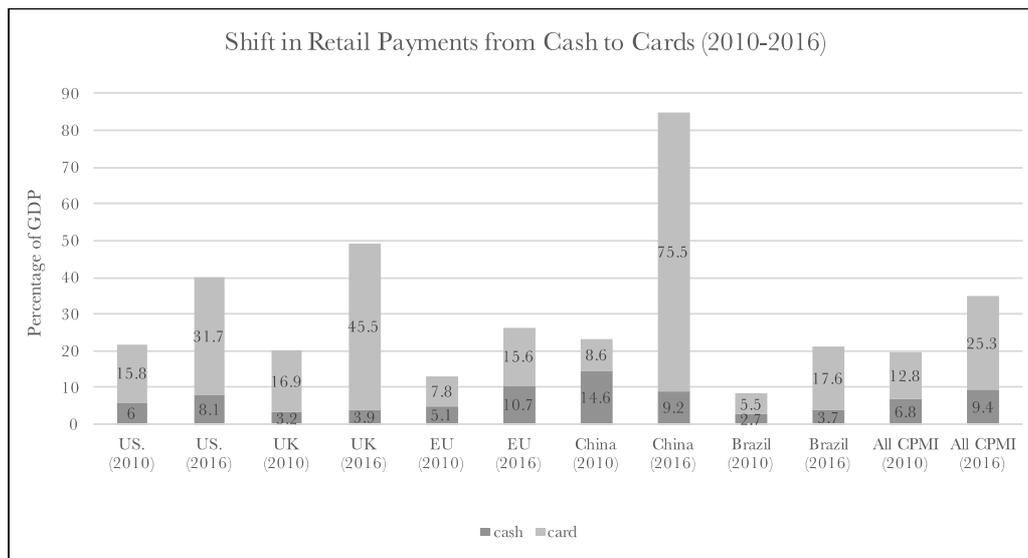
Few people would argue with the statement that payment systems perform a variety of socially useful economic functions. But what exactly are these functions? What benefits do they confer on society? And what risks do they pose? Professor Hal Scott argues that effective payment systems share several key features. According to Scott, the key features of retail payment systems, for example, include: ease of use; the ability to transfer funds from any location; certainty of payment; reversibility for mistaken payments; liquidity; recordkeeping; safety and security, and financial inclusion.⁷ While often described in somewhat different terms, these same features—or some combination thereof—are frequently cited by scholars and policymakers as the core functions of modern payment systems.⁸

In reality, this laundry list of features fails to fully capture the essential functions of modern payment systems. Indeed, these features tell us very little about what payment systems actually *do*. Ultimately, these systems can be understood as performing three core functions: custody, funds transfer, and liquidity. *Custody* involves the protection of customer funds from loss, theft, destruction, or any decrease in their nominal value. Historically, the archetypal example of a mechanism for ensuring the custody of customer funds was a bank vault. Today, custody also typically involves the maintenance of accurate and up-to-date electronic records of the location, ownership, and amount of customer funds. *Transfer*, meanwhile, refers to the ability to safely and securely send these funds from one party to another in satisfaction of financial obligations. Like custody, these transfers increasingly take place electronically via debit and credit card transactions, wire transfers, direct debit and standing orders, and other electronic fund transfers. Perhaps nowhere is this trend more clearly evident than in connection with the ongoing shift from cash to credit and debit card payments for retail transactions (see Figure 1).

⁷ See Hal Scott, *The Importance of the Retail Payment System* (16 December 2014), (unpublished manuscript) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2539150.

⁸ See for example, Bruce Summers, “The Payment System in a Market Economy” in Bruce Summers (ed.), *THE PAYMENT SYSTEM: DESIGN, MANAGEMENT, AND SUPERVISION 1* (1994), 2–7; Charles Kahn & William Roberts, *The Economics of Payment Finality*, 87 *FED. RES. BANK OF ATLANTA ECON. REV.* (2002), and The Bill & Melinda Gates Foundation, *FIGHTING POVERTY, PROFITABLY: TRANSFORMING THE ECONOMICS OF PAYMENTS TO BUILD SUSTAINABLE, INCLUSIVE FINANCIAL SYSTEMS* (2013), <https://docs.gatesfoundation.org/documents/fighting%20poverty%20profitably%20full%20report.pdf>.

Figure 1



Source: Committee on Payments and Market Infrastructures (CPMI) (2017).

All payment systems provide some form of custody and fund transfer. Many of these systems then combine these functions with the promise of *liquidity*. Professor Scott defines liquidity broadly as encompassing “the ability of an asset to be used immediately and without delay to perform basic economic activities such as purchases of products and services and repayment of debt.”⁹ We use the term in the more narrow sense that a customer is able to convert, exchange, or redeem claims against a firm into cash (or cash equivalents) upon demand.¹⁰ The hallmark of perfect liquidity is thus the ability of a customer to convert claims into cash *instantaneously* and at *full value*.¹¹

Framing the core functions of modern payment systems in this light helps illuminate both their principal benefits and attendant risks. The benefits stem from the secure custody of customer funds, the safe and rapid transfer of these funds to other parties within an extremely large payment network, and the ability to withdraw funds from the system at any time on demand. The risks, meanwhile, flow from two primary sources. The first is the prospect of delayed transfer or conversion of customer funds

⁹ Scott, *supra* note 7, 40.

¹⁰ Indeed, in many cases we would expect this convertibility to be a necessary precondition to the willingness of third parties to accept the transfer of the claim on the firm as payment. Simultaneously, it is also possible to imagine a completely ‘cashless’ society in which all payments are made electronically within the payment system itself—thereby eliminating the prospect of conversion into cash. For a description of the potential benefits and costs of a (near) cashless system and a proposal for how to achieve it, see Kenneth Rogoff, *THE CURSE OF CASH* (2016).

¹¹ For an in-depth discussion of liquidity more generally, see Markus Brunnermeier & Lasse Pedersen, *Market Liquidity and Funding Liquidity*, 22:5 REV. OF FIN. STUD. 2201 (2009).

(*illiquidity*). The second, perhaps even more unsettling, prospect is that a customer’s claim against a firm will be characterised as an ordinary unsecured liability in the context of any insolvency proceedings—leaving the customer exposed to the risk that the nominal value of their claim will be written down or perhaps even destroyed entirely (*loss of value*). Notably, these two risks intersect where delays in the transfer or conversion of customer funds force customers to sell their claims against a firm for less than their nominal value. Crucially, where either of these risks materializes, they will critically undermine the ability of a firm to perform core payment functions, thereby preventing it from delivering its important and unique benefits to society.

Figure 2

The Core Functions and Risks of Modern Payment Systems

Function or Benefit	Attendant Risk
Custody: the protection of customer funds from loss, theft, destruction, or any decrease in their nominal value.	Loss of value: reduction in nominal value of customer claims in insolvency.
Transfer: rapid and secure transmission of customer funds to third parties.	Illiquidity: delay in the transfer of customer funds to third parties.
Liquidity: conversion of claims into cash (or cash equivalents).	Illiquidity: delay in the conversion of customer funds into cash (or equivalents). Loss of value: forced sale of claims for less than their nominal value.

Together, these core payment functions are reflected in the promise that every bank makes to its depositors to hold, transfer, and convert deposited funds into cash on demand. Indeed, if banks could not credibly commit to perform these functions, it is difficult to see why we would trust them with so much of our hard-earned money. The trillion-dollar question thus becomes: why have we historically trusted banks to perform these functions? And, more importantly, why do we generally not entrust these functions to other types of firms?

II. The Advantages of Bank-based Payment Systems: A Consumer Protection Perspective

Intuitively, we might expect almost any firm to be able to perform core payment functions in *good times*. Indeed, when firms are profitable, flush with cash, and not

subject to correlated demands from customers to transfer or convert deposited funds, the most significant barriers to the performance of core payment functions are likely to be technological: e.g. building and maintaining the internal account system and electronic network architecture necessary to operate a large-scale payment system. On its face, this presents us with something of a puzzle: if the barriers to entry are essentially technological, and if technology costs decline over time, why has a single and rather peculiar species of firm—the bank—come to dominate modern payment systems?

To many, the answer to this question is that banks enjoy economies of scale and network effects that enable them to make the necessary technological investments—thus giving them a comparative advantage in the performance of core payment functions.¹² This raises the tantalizing prospect that, as technology costs continue to decline, we could eventually see the emergence of new firms capable of rivalling banks' historical dominance in the provision of payment services. In particular, we might expect to see the expansion of technology firms—and especially those benefiting from their own network effects—into the payments industry. Indeed, this prospect is quickly becoming a reality: with the recent launch of Facebook's 'Libra' project being just one of many prominent examples.¹³ Ultimately, however, while explanations for this comparative advantage based on scale or network effects may possess some intuitive appeal, they are not entirely consistent with either the historical development of bank-based payment systems¹⁴ or the highly fragmented structure of the banking industry in many jurisdictions.¹⁵ More importantly, these explanations completely disregard the pivotal role of regulation in enabling banks to perform core payment functions—not just in good times but also, and crucially, in *bad times*.

¹² Others view this credibility as a function of banks' unusual and highly fragile capital structure; see Charles Calomiris and Marcel Kahan, *The Role of Demandable Debt in Structuring Optimal Banking Arrangements*, 81:3 AM. ECON. REV. 497 (1991).

¹³ See Hannah Murphy, "Facebook unveils global digital coin called Libra", *THE FINANCIAL TIMES* (18 June 2019). <https://www.ft.com/content/af6b1d48-90cc-11e9-aea1-2b1d33ac3271>.

¹⁴ For a magisterial history of Western payment systems and their relationship with conventional deposit-taking banks, see Benjamin Geva, *THE PAYMENT ORDER OF ANTIQUITY AND THE MIDDLE AGES: A LEGAL HISTORY* (2011).

¹⁵ Developed countries with particularly fragmented banking industries include the United States, Germany, and Italy.

So what do firms do in bad times—when profits evaporate, when cash is scarce, and when customers are stampeding for the exits? For most firms, the answer is very simple: they either put themselves into, or are forced into, *insolvency* proceedings. While there exists significant variation in corporate insolvency law regimes around the world, entering an insolvency proceeding typically has two important legal implications. The first is the application of a procedural rule—an automatic stay—suspending enforcement action against the assets of the insolvent firm. The second is a substantive requirement—the *pari passu* rule—dictating that unsecured creditors share in any subsequent distribution of the firm’s assets on a *pro rata* basis. All other things being equal, the application of these procedural and substantive rules will have an impact on both the timeframe within which customers can expect to receive repayment (illiquidity) and, insofar as they are treated as unsecured creditors, the value that they ultimately receive at the conclusion of the insolvency process (loss of value). In other words, the legal treatment of customer funds in the event of a firm’s insolvency will have a material impact on the credibility of its commitment to perform core payment functions.

Viewed in this light, the single most important feature of conventional deposit-taking banks is the fact that the law often goes to extreme lengths to make sure that depositors are *not* subject to the harsh strictures of general corporate insolvency law. It all starts with the problem of bank runs. The business of banking is based on leverage: and specifically the issuance of deposits and other short-term debt to finance longer term loans and other investments. The heavy reliance on short-term debt makes banks vulnerable to destabilizing runs by depositors and other short-term creditors.¹⁶ Policymakers seek to reduce the probability and impact of these runs in two principal ways. First, central banks stand ready to provide financial assistance in their capacity as lenders of last resort. These lender of last resort facilities exist for the purpose of extending banks short-term collateralized loans during periods when private sources of short-term financing are unavailable and where, as a result, banks face a potential

¹⁶ See Douglas Diamond & Philip Dybvig, *Bank Runs, Deposit Insurance, and Liquidity*, 91 J. POL. ECON. 401 (1983) (discussing “risks which lead to a demand for liquidity” that can lead to bank runs). For a recent survey of the literature on the vulnerability of banks to depositor runs, see Franklin Allen et al., *Moral Hazard and Government Guarantees in the Banking Industry*, 1 J. FIN. REG. 30 (2015). For a description of how banks can be vulnerable to runs by short-term creditors other than depositors, see Gary Gorton & Andrew Metrick, *Securitized Banking and the Run on Repo*, 104 J. FIN. ECON. 425 (2012).

liquidity squeeze. The proceeds of these loans are then used by banks to pay their ongoing liabilities to depositors and other creditors, thereby relaxing any liquidity constraints and enabling banks to keep the lights on when other firms would be forced into insolvency.

Second, bank regulation in most developed countries includes some form of deposit insurance scheme. These schemes effectively guarantee that eligible depositors will be repaid any deposited funds—typically up to a predetermined cap—in the event of a bank’s insolvency. In the United States, for example, the Federal Deposit Insurance Corporation (FDIC) will reimburse customers 100% of the amount of insured deposits up to a maximum of \$250,000 per depositor.¹⁷ The equivalent protection in the European Union is currently €100,000 per depositor per bank.¹⁸ These schemes then typically commit to reimburse depositors within a relatively short span of time following a bank’s insolvency: currently 15 business days in the European Union and often as little as one business day in the United States.¹⁹

Deposit guarantee schemes are thus designed to effectively step into the shoes of an insolvent bank: honouring the bank’s commitment to provide customers with the liquidity necessary to shift their funds to a new and presumably more solvent bank. In order to make this commitment credible, these schemes are typically provided by either the government itself or out of a dedicated pool of assets set aside for the purposes of funding deposit insurance claims. In theory, the existence of deposit insurance schemes reduces the incentives of insured depositors to engage in destabilizing runs.²⁰ More importantly for the present purposes, this insurance serves to insulate customers from the risks of illiquidity and loss of value that would otherwise be associated with bank insolvency.

In the wake of the global financial crisis, bank regulators in several countries have buttressed their lender of last resort facilities and deposit insurance schemes by

¹⁷ See Federal Deposit Insurance Act, §11.

¹⁸ See EU Directive 2009/14/EU, Art. 1(3)(a).

¹⁹ See EU Directive 2014/49/EU, Art. 8(2)(b) and FDIC, Fall Consumer News (Fall 2014), <https://www.fdic.gov/consumers/consumer/news/cnfall14/misconceptions.html>.

²⁰ Diamond & Dybvig, *supra* note 16 and Allen et al., *supra* note 16.

introducing new special resolution regimes for failing banks.²¹ Whereas lender of last resort facilities are designed to provide support to solvent but illiquid banks, special resolution regimes enable regulators to restructure or wind down the operations of banks that have crossed over the threshold from illiquidity into insolvency.²² These regimes provide regulators with several powerful tools in pursuit of this objective: including the ability to write-down a bank's liabilities, convert its outstanding debt into equity, and transfer some or all of its assets to either a private sector purchaser or public sector bridge bank.²³ Armed with these tools, the expectation is that bank 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 for the introduction of these special resolution regimes was to ensure that—unlike under general corporate insolvency law—banks would be permitted to perform their core payment functions *during* the resolution process.

The combination of lender of last resort facilities, deposit insurance schemes, and special resolution regimes make a bank's commitment to perform core payment functions extremely credible. This extraordinary government support—not generally available to other firms—is typically justified on the grounds that banks are vulnerable to destabilizing runs, that their correlated failure can generate significant knock-on effects for the real economy, and that the application of general corporate insolvency law could serve to transmit or magnify financial shocks.²⁴ Importantly, this support is also justified on the grounds that it helps ensure the smooth and efficient operation of bank-based payment systems during periods of institutional or systemic distress.²⁵ The practical effect of this support is to provide depositors with a relatively high level of protection against the risks of illiquidity and loss of value. This raises an obvious but

²¹ See for example, Council Directive 2014/59/, art. 5, 2014 O.J. (L 173), 190 (EU) (establishing a framework for the recovery and resolution of credit institutions and investment firms) [the BRRD] and Bank of England, *The Bank of England's Approach to Resolution* (October 2014) (describing frameworks for resolving failing banks, building societies, and some types of investment firms).

²² For a more detailed examination of the development and functions of special resolution regimes, see generally John Armour, *Making Bank Resolution Credible*, ECGI Working Paper No. 244/2014 (2014).

²³ *Id.*

²⁴ *Id.* at 456-459.

²⁵ See for example, BRRD, *supra* note 21 and Bank of England, *supra* note 21, 7.

important question: can firms performing core payment functions outside the regulated banking system credibly offer the same level of protection to their customers?

III. Mapping the Shadow Payment System

The technological advancements driving the shift from cash to electronic payments have made it less costly for firms outside the conventional banking system to perform core payment functions. This is reflected in the emergence and rapid growth of a diverse range of shadow payment platforms—SPPs—within the past decade. To this point, however, the diversity of SPP business models has presented a significant challenge for those seeking to map this burgeoning shadow payment system. In order to begin to address this challenge, this section offers a taxonomy of the major types of SPPs: proprietary and bank-based P2P payment platforms; money remittance platforms; mobile money platforms; and centralized and decentralized cryptocurrency exchanges. It also identifies the largest SPPs in each category, the jurisdictions of their incorporation, the laws governing their customer contracts, and any applicable regulatory frameworks.

Figure 3

Types of Shadow Payment Platforms

Type	Key Features
<i>Proprietary P2P platforms</i>	Intermediated peer-to-peer payment platforms offering <i>transfer</i> and <i>long-term custody</i> functions.
<i>Bank-based P2P platforms</i>	Intermediated peer-to-peer payment platforms offering <i>transfer</i> and <i>long-term custody</i> functions, but where the <i>custody function is outsourced</i> to a conventional deposit-taking bank.
<i>Money remittance platforms</i>	Intermediated peer-to-peer payment platforms offering <i>transfer</i> and <i>incidental and temporally limited custody</i> functions.
<i>Mobile money platforms</i>	Intermediated peer-to-peer payment systems offering <i>transfer, custody, and liquidity</i> through a mobile phone network.
<i>Decentralized cryptocurrency exchanges</i>	Platforms facilitating crypto-crypto exchanges (<i>transfer</i>) using distributed ledger or other equivalent technologies, often combined with multisig technology. The combination of distributed ledger and multisig technology mean that these platforms <i>do not take custody</i> of customer assets in the conventional sense.
<i>Centralized cryptocurrency</i>	Platforms facilitating crypto-crypto and/or crypto-fiat exchanges (<i>transfer</i>) via the platform's own accounts. These platforms typically

<i>exchanges</i>	contemplate <i>short-term custody of customer fiat assets</i> . Some also contemplate <i>longer term custody of customer crypto assets</i> .
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A. P2P payment platforms

For most of us, the vast majority of our interactions with the shadow payment system are likely to be with P2P payment platforms such as PayPal, Alipay, or WeChat Pay. P2P payment platforms utilize the internet to communicate payment instructions and execute electronic fund transfers. For customers, these platforms offer two distinct advantages.²⁶ First, unlike bank-based electronic payments, payors can initiate a fund transfer using a secure app or website without having to provide the payee with sensitive financial information. Second, especially for small business customers, these platforms are often far less costly than more conventional merchant banking services that would enable them to accept debit or credit card payments. For these reasons, P2P payment platforms are often viewed as offering a relatively fast, easy, secure, and affordable way of making and receiving retail payments.

There are three different types of P2P payment platforms. *Bank-based P2P payment platforms* facilitate the direct transfer of funds between accounts held by the payor and payee at their respective banks. 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 instructions to the store's card reader. The funds are then transferred directly from your bank account to Starbucks' bank account, without ever passing through Apple's hands. Accordingly, while bank-based P2P payment platforms play an important role in facilitating electronic fund transfers, the custody function is effectively outsourced to conventional deposit-taking banks. Importantly, because these platforms do not perform a custody function, their insolvency poses no risk to customer funds.

Proprietary P2P payment platforms facilitate payments via book entry transfers between customer accounts held and administered by the SPP itself. Before using the platform, each customer is required to open an account. These accounts can be funded using a debit or credit card, or from the proceeds of inbound fund transfers from other

²⁶ For a more detailed description of these benefits, see Kenneth Kuttner & James McAndrews, *Personal On-Line Payments*, 7 FED. RES. BANK OF N.Y. ECON. POL'Y REV. 35, 37 (2001) and Ronald Mann, *Regulating Internet Payment Intermediaries*, 82 TEX. L. REV. 681, 681-82 (2003).

platform customers. Customers can then either transfer paid-in funds to a conventional bank account or maintain a positive balance in the platform's proprietary accounts for the purpose of making future payments. Accordingly, unlike bank-based P2P payment platforms, proprietary P2P payment platforms combine the ability to transfer funds with a longer term custodial function. In theory, this introduces the risk that the insolvency of these platforms could expose customers to both illiquidity during the insolvency process, along with the potential loss of value in the event that they were characterized as unsecured creditors.

The third and final type of P2P payment platforms are *money remittance platforms*. Money remittance platforms act as electronic middlemen: facilitating payments between two or more individuals, often in different countries or involving multiple currencies. There are two basic types of money remittance platforms that more or less map onto the distinction between bank-based and proprietary P2P payment platforms. In the first model, typified by WhatsApp's payment service, WhatsApp Pay, the platform uses a unified payments interface (UPI) linked to a virtual payment address for each customer in the platform's network. The UPI enables payors to instruct their bank to transfer funds directly to payees. In the second model, a money remittance transaction begins with funds being transferred from the payor's bank account to the money remittance platform itself.²⁷ After deducting its fees and calculating any applicable foreign exchange rate, the platform then transfers the net (converted) funds to the payee's bank account. Accordingly, while some money remittance platforms do combine transfer and custodial functions, any custody is essentially incidental and limited in time to the period between when the payment is initiated by the payor and when it arrives in the payee's bank account. As a result, while the insolvency of these platforms could technically pose a risk to customer funds, the ephemeral nature of the custody means that, as a practical matter, it is unlikely that customers will experience any illiquidity or loss of value.

²⁷ In this respect, money remittance platforms bare a basic similarity with proprietary P2P payment platforms. By the same token, where money remittance platforms simply facilitate transfers between the payor and payee's bank accounts, they bare a similarity to bank-based payment platforms.

Figure 4

Largest P2P Payment Platforms

SPP	Type	Active user accounts	Annual payment volume (assets in custody)
Alipay	Proprietary P2P platform	900 million (est. Nov 2018)	Not publicly available
WeChat Pay	Proprietary remittance platform	900 million (est. Dec 2018)	Not publicly available
PayPal	Proprietary P2P platform	277 million (Dec 2018)	\$578 billion (\$21.6 billion)
Apple Pay	Bank-based P2P platform	252 million (est. Aug 2018)	Not publicly available

Source: PayPal SEC Form 10-K (2018); Alibaba Group SEC Form 20-F (2018); <http://www.pymnts.com>.

B. Mobile money platforms

If P2P systems such as PayPal and Alipay represent the current state of the shadow payment system across the developed world, 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 perform core payment functions. Mobile money platforms enable customers to deposit and withdraw funds through a network of local agents, typically including post offices, corner stores, petrol stations, and other retail establishments.²⁸ These platforms then enable customers to use their mobile phones to transfer deposited funds—often referred to as “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. More recently, however, mobile providers have coordinated

²⁸ As of December 2015, Groupe Speciale Mobile Association (GSMA) estimated that mobile money platforms collectively employed approximately 3.2 million local agents; see GSMA, 2015 STATE OF THE INDUSTRY: MOBILE FINANCIAL SERVICES FOR THE UNBANKED 22 (2016), https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2016/04/SOTIR_2015.pdf.

in the development of interoperable platforms facilitating payments across different networks.²⁹

One of the first—and most successful—mobile money platforms, M-Pesa, was launched by Safaricom in Kenya in 2007. As of 2018, Group Speciale Mobile Association, a leading industry trade association, reported that there were more than 270 mobile money platforms, operating in 90 countries, with approximately 300 million active accounts, and collectively processing over 2.4 billion transactions per year.³⁰ The largest mobile money platforms by number of active customers are listed in Figure 5. In terms of geographic dispersion, by far the largest number of mobile money platforms are located in Sub-Saharan Africa, with Latin America and in particular South and East Asia also contributing significantly to global growth in terms of the number of new platforms.³¹

Figure 5

Largest Mobile Money Platforms

SPP	Jurisdiction(s)	Active user accounts
M-Pesa	Kenya, Tanzania, Democratic Republic of Congo, Mozambique, India, Lesotho	28.5 million (June 2018)
MTN Mobile Money	Cameroon, Swaziland, Zambia, Ghana, Rwanda, Guinea-Bissau, Uganda, Congo, Benin, Côte d'Ivoire, Guinea, Sudan	24.1 million (June 2018)
Orange Money	Botswana, Cameroon, Côte d'Ivoire, Madagascar, Mali, Niger, Senegal, Burkina Faso, Guinea, Democratic Republic of Congo, Egypt, Tunisia, Dominican Republic, Liberia, Central African Republic, Romania, Guinea-Bissau, Sierra Leone	15.2 million (December 2018)
Tigo Money	El Salvador, Guatemala, Honduras, Paraguay, Chad, Bolivia, Senegal	8 million (est. 2018*)

Source: McKinsey; Forbes; GSMA; Mobile World Live; *Active accounts not reported.

²⁹ See for example, GSMA, STATE OF THE INDUSTRY REPORT ON MOBILE MONEY 13 (2018), https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2015/03/SOTIR_2014.pdf [GSMA REPORT (2018)].

³⁰ GSMA REPORT (2018), 13. Notably, our sample of mobile money firms is considerably smaller, mostly because we focus on the subset of mobile money platforms that do not use conventional deposit-taking banks to perform custodial functions.

³¹ GSMA REPORT (2018), 20-21.

The success of M-Pesa and many other mobile money platforms is a function of their ability to establish a network of local agents: thus ensuring that customers are able to deposit and withdraw funds in a wide variety of locations. In the case of M-Pesa, these agents transact with customers on their own account, using a float of cash and e-money held in their own name to fund transfers and withdrawals.³² When this float is exhausted, the agent must then seek to replenish it by exchanging cash or e-money with other, typically larger, agents.³³ At the top of this multi-tiered payment architecture are then a small number of large wholesale agents with whom Safaricom—or, more precisely, a trustee corporation for which Safaricom acts as agent—transacts directly for the issuance of new e-money and the conversion of e-money into cash or other freely available funds.³⁴

Like proprietary P2P payment systems, the fact that mobile money platforms perform a long-term custody function poses two principal risks. The first is that customers will be unable to transfer e-money or convert it into cash in the event of a platform's insolvency. To put this risk into perspective, the World Bank's 2017 *Doing Business* survey estimates that the average length of a corporate insolvency process in Sub-Saharan Africa—measured by reference to the time between default and the distribution to senior secured creditors³⁵—is approximately 2.9 years.³⁶ The equivalent

³² 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; Michael Klein & Colin Mayer, *Mobile Banking and Financial Inclusion: The Regulatory Lessons*, World Bank Policy Research Working Paper No. 5664, 7-8 (2011).

³³ Frederik Eijkman et al., *Bridges to Cash: the Retail End of M-PESA*, 34 *SAVINGS & DEV.* 219 (2010).

³⁴ *Id.*, 224.

³⁵ See Resolving Insolvency Methodology, THE WORLD BANK: DOING BUSINESS, <http://www.doingbusiness.org/methodology/resolving-insolvency#time> [WORLD BANK, RESOLVING INSOLVENCY]. 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 insolvency or foreclosure proceedings. *Id.*

³⁶ *Id.* 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 *infra* Part IV. Inevitably, however, there will be some delay while a customer's proprietary interest is verified. If there is any dispute as to the scope or validity of this interest, these delays may be significant. See Robert Hantusch, *Trust Claims and Client Monies: Left High and Dry or Scooping the Pool?* 4 (2010), 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

figures were 2.6 years for East Asia, 2.6 years for South Asia, and 2.9 years for Latin America and the Caribbean.³⁷ The second risk is that this e-money will be characterized as an unsecured claim in the insolvency process, with the result that customer funds held by the platform will be made available for distribution to the firm's general body of creditors.³⁸ In this respect, it is worth observing that the World Bank has estimated that the mean recovery rate for *secured* creditors in Sub-Saharan Africa is approximately 20.3 cents on the dollar.³⁹ The equivalent figures were 35.5 cents for East Asia, 32.7 cents for South Asia, and 30.9 cents for Latin America and the Caribbean.⁴⁰ On average, therefore, unsecured creditors of insolvent firms in Sub-Saharan Africa, East and South Asia, and Latin America receive *nothing* at the conclusion of the insolvency process.⁴¹

C. Cryptocurrency exchanges

One of the most controversial developments in global finance in recent years has been the emergence and proliferation of so-called "cryptocurrencies". By far and away the most popular cryptocurrency is Bitcoin, with a market capitalization of over \$189 billion as of July 2019.⁴² The technological backbone of Bitcoin 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 "mining".⁴³ Once verified, the transaction is then permanently added to the distributed

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

³⁷ WORLD BANK, RESOLVING INSOLVENCY, *supra* note 35.

³⁸ The holders of e-money would typically hold a bundle of contractual rights against the platform, including the right to call for the conversion of their e-money. In the event of breach by the platform, 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.

³⁹ WORLD BANK, RESOLVING INSOLVENCY, *supra* note 35.

⁴⁰ Id.

⁴¹ Unsecured creditors may enjoy some preferential status vis-à-vis secured creditors. Id.

⁴² See COINMARKETCAP, <http://www.coinmarketcap.com>. By way of comparison, the market capitalization of the second most popular crypto-currency, Ethereum, is just under \$1 billion. Id.

⁴³ In exchange for verifying transactions, these "miners" are rewarded with newly created Bitcoins. For further information, see generally SATOSHI NAKAMOTO, BITCOIN: A PEER-TO-PEER ELECTRONIC CASH SYSTEM, BITCOIN (8 November 2008), <http://bitcoin.org/bitcoin.pdf>.

ledger, thus creating a single historical record of all transactional activity.⁴⁴ 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.⁴⁵ Nevertheless, in theory at least, the broader growth potential of cryptocurrencies built around Blockchain and other similar protocols is potentially enormous.

The emergence of Bitcoin and other cryptocurrencies has spurred the development of a new breed of financial institution: cryptocurrency exchanges. There are two basic types of cryptocurrency exchanges. *Decentralised exchanges* match buyers and sellers without ever taking delivery of the funds and/or cryptocurrencies being traded. Instead, each transaction is executed using a so-called “smart” contract: a rules-based computer protocol that, in theory, facilitates self-executing state-contingent contracts. In an exchange environment, these smart contracts typically employ “multisig” technology requiring two of three counterparties—the buyer, the seller, and a third party arbitrator—to have provided their unique electronic signatures before a proposed transaction is published to the ledger. The combination of multisig technology, smart contracts, and a third party arbitrator create something akin to an electronic escrow mechanism (crucially, however, minus the custodial dimension), thus ensuring that all the contingencies specified in a smart contract are satisfied before any assets change hands. Once these contingencies have been satisfied, the ledger is then updated to reflect the transaction.

Decentralized cryptocurrency exchanges avoid the risks associated with entrusting customer funds to a financial intermediary. However, because execution and settlement take place “on chain” in accordance with the relevant network, exchange, and smart contract protocols, the processing times for transactions on decentralized exchanges can be relatively slow. The fact that all transactions take place on chain also limits the universe of possible transactions to customers and cryptocurrencies on the same ledger or network. Collectively, these drawbacks help explain why decentralised

⁴⁴ See Mohit Kaushal & Sheel Tyle, *The Blockchain: What It Is and Why It Matters*, BROOKINGS INST. (13 January 2015), <https://www.brookings.edu/blog/techtank/2015/01/13/the-blockchain-what-it-is-and-why-it-matters/>.

⁴⁵ 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, *supra* note 43.

exchanges have thus far only captured approximately 1% of the total trading volume in cryptocurrencies (see Figure 6).⁴⁶

Figure 6

Largest Cryptocurrency Exchanges

SPP	Type	30-day trading volume (July 2019; USD)
BitMax	Centralized cryptocurrency exchange	\$151.1 billion
Binance	Centralized cryptocurrency exchange	\$65.4 billion
OKEx	Centralized cryptocurrency exchange	\$55.8 billion
DigiFinex	Centralized cryptocurrency exchange	\$47.3 billion
Huobi Global	Centralized cryptocurrency exchange	\$45.8 billion

Source: <https://coinmarketcap.com>.

The potential drawbacks of decentralized ledgers also help explain the emergence of *centralized* cryptocurrency exchanges. Like their decentralized counterparts, centralized exchanges match buyers and sellers of various cryptocurrencies. Unlike decentralized exchanges, however, centralized exchanges facilitate “off chain” transactions on the accounts of the exchange itself. In order to settle a transaction on a centralized exchange, each customer must first transfer sufficient crypto or fiat currency into their account with the exchange. Once the relevant assets have been transferred, the exchange then debits and credits the customer accounts of both the buyer and the seller. Customers receiving fiat currency can then elect to either leave their funds in their account with the exchange or transfer them to a conventional financial intermediary. Customers receiving cryptocurrency, in contrast, must generally continue to hold it with the exchange itself until such point in time as they decide to sell it.⁴⁷ By conducting transactions off-chain, centralized exchanges expand the potential

⁴⁶ Token Insight, 2018 CRYPTOCURRENCY EXCHANGE ANNUAL REPORT (January 2019), <https://tokeninsight.com>.

⁴⁷ While the customer can in theory transfer the cryptocurrency to another wallet that they own, they would need to undertake this transaction ‘on chain’.

universe of eligible trading partners, cryptocurrencies, and ledgers—thus dramatically expanding the size of the payment network. In theory, they also facilitate faster execution and settlement than decentralized exchanges. Crucially, however, the introduction of the exchange as an intermediary exposes customers to its default or insolvency. And while empirical data is still somewhat scarce, at least one preliminary study suggests that these exchanges have thus far exhibited relatively high failure rates.⁴⁸

The risks associated with exchange default were vividly illustrated by the 2014 failure of Mt Gox. Founded in Tokyo in 2009, Mt. Gox quickly rose to become one of the cornerstones of the nascent Bitcoin payment architecture.⁴⁹ At its peak in 2013, it has been estimated that Mt. Gox accounted for approximately 70% of global trading volume in Bitcoin.⁵⁰ In retrospect, however, this success masked a number of significant institutional problems. In June 2013, Mt. Gox was forced to temporarily suspend the withdrawal of U.S. dollar customer balances amidst widespread rumours that the exchange was on the verge of insolvency.⁵¹ In November of that year, *Wired* magazine reported that customers were experiencing delays of weeks, and in some cases months, before they were able to withdraw their funds.⁵² Then, on February 28, 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 the exchange itself, were unaccounted for and had likely been stolen.⁵³ On the basis of Bitcoin's market price at the time, this translated into over \$470 million in missing customer assets.⁵⁴

⁴⁸ See Tyler Moore & Nicolas Christin, *Beware the Middleman: Empirical Analysis of Bitcoin-Exchange Risk*, FIN. CRYPTO. & DATA SEC. (2013) 25.

⁴⁹ Id.

⁵⁰ See Robert McMillan & Cade Metz, *The Rise and Fall of the World's Largest Bitcoin Exchange*, WIRED (6 November 2013), <https://www.wired.com/2013/11/mtgox/> (describing the progression of technical issues faced by Mt. Gox).

⁵¹ Id.

⁵² Id.

⁵³ See Robin Sidel et al., *Almost Half a Billion Worth of Bitcoins Vanish: Mt. Gox Says it Lost 750,000 of Customers' Bitcoin to Fraud*, WALL ST. J. (28 February 2014), <https://www.wsj.com/Articles/mt-gox-to-hold-news-conference-1393579356> (explaining the events leading up to the bankruptcy of Mt. Gox).

⁵⁴ Id.

While insolvency proceedings are still ongoing in both Japan and the United States⁵⁵, it is likely that customers who held Bitcoin with Mt. Gox will be treated as unsecured creditors. Understandably, many customers have therefore already sold their claims in the estate of Mt. Gox at a steep discount⁵⁶, and it remains unclear what percentage of their claims remaining customers will ultimately recover.

We can debate whether Bitcoin or other cryptocurrencies should be viewed as possessing the same “money-like” characteristics as fiat currencies issued by sovereign states. We can also debate whether Blockchain and other distributed ledger technologies will eventually come to rival—or perhaps even supplant—more conventional bank-based payment systems. Indeed, we are sympathetic to the view that cryptocurrencies presently exhibit few of the hallmarks of more conventional forms of money, and that Blockchain may never live up to the hype. Yet insofar as customers are using these cryptocurrency exchanges to store value that they then use to purchase other assets, these platforms can ultimately be viewed as performing core payment functions. And as demonstrated by the failure of Mt. Gox, the performance of these functions by firms outside the perimeter of the regulated banking system can expose customers to the risks of illiquidity and loss of value.

D. The Legal Geography of the Shadow Payment System

Where customers are exposed to the risk of an SPP’s default or insolvency, the laws governing the firm’s organization, its customer contracts, and domestic insolvency law, along with any applicable regulatory frameworks, will inevitably play an important role in determining whether, and to what extent, these customers are likely to experience illiquidity or loss of value. So where are SPPs domiciled? What law governs their customer contracts? And what regulatory framework govern their activities? Based on hand collected data from over 100 SPPs, Figures 7, 8 and 9 offer some insights into these questions.

⁵⁵ See Motion for Protective Order, In re Mt Gox Co., No. 14-31229-sgj15, (Bankr. N.D. Tex. 10 March 2014) (requesting provisional relief): Amended Complaint. Greene et al. v. Mt Gox Inc., No. 1:14-cv-01437 (2014 WL 1101996 N.D.Ill.), and Tōkyō Chihō Saibansho (Tokyo Dist. Ct.) 5 August 2015, Hei 26 (wa) no. 33320, 2015WLJPCA08058001.

⁵⁶ Bitcoin Builder, for example, offered to buy customers’ Mt. Gox Bitcoin at 0.11 per Bitcoin in 2015. See JP Buntinx, *The Mt. Gox Post-Bankruptcy Claims: A Detailed Guide*, BITCOINIST (8 May 2015), <http://bitcoinist.com/mtgox-post-bankruptcy-claims-detailed-guide/>.

Figure 7 breaks down the geographic dispersion of the SPPs in our sample on the basis of their jurisdiction of incorporation. The United States (12%) and United Kingdom (9%) are the most popular jurisdictions, followed by other EU member states (8%), Canada (3%), and Australia (3%). Other jurisdictions in which more than one of the SPPs in our sample are domiciled include Hong Kong, Singapore, and South Africa. Notably, despite its general popularity amongst SPPs as a jurisdiction of incorporation, only one of the 42 cryptocurrency exchanges in our sample—Gemini—is incorporated in the United States.

Figure 7

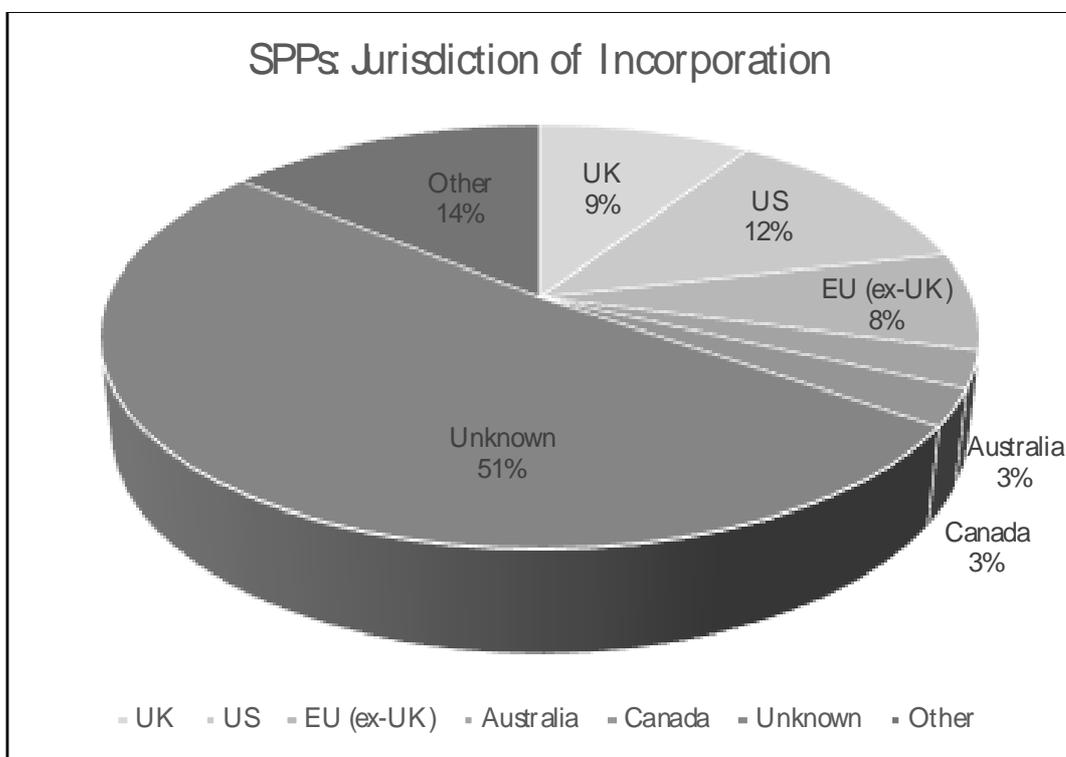


Figure 8 breaks down the SPPs in our sample on the basis of the jurisdictions governing their customer contracts. Once again, the United Kingdom (20%) and United States (13%) lead the pack, with several SPPs domiciled in other jurisdictions electing to subject their customer contracts to the domestic law of one of these two jurisdictions. Notably, both Singapore (6%) and Hong Kong (4%) emerge as jurisdictions of choice for many cryptocurrencies exchanges based in Asia: with nine of the 10 SPPs in this category selecting the governing law of one of these two jurisdictions. Surprisingly,

seven SPPs—predominantly cryptocurrency exchanges—do not specifically identify which domestic laws govern their customer contracts.

Figure 8

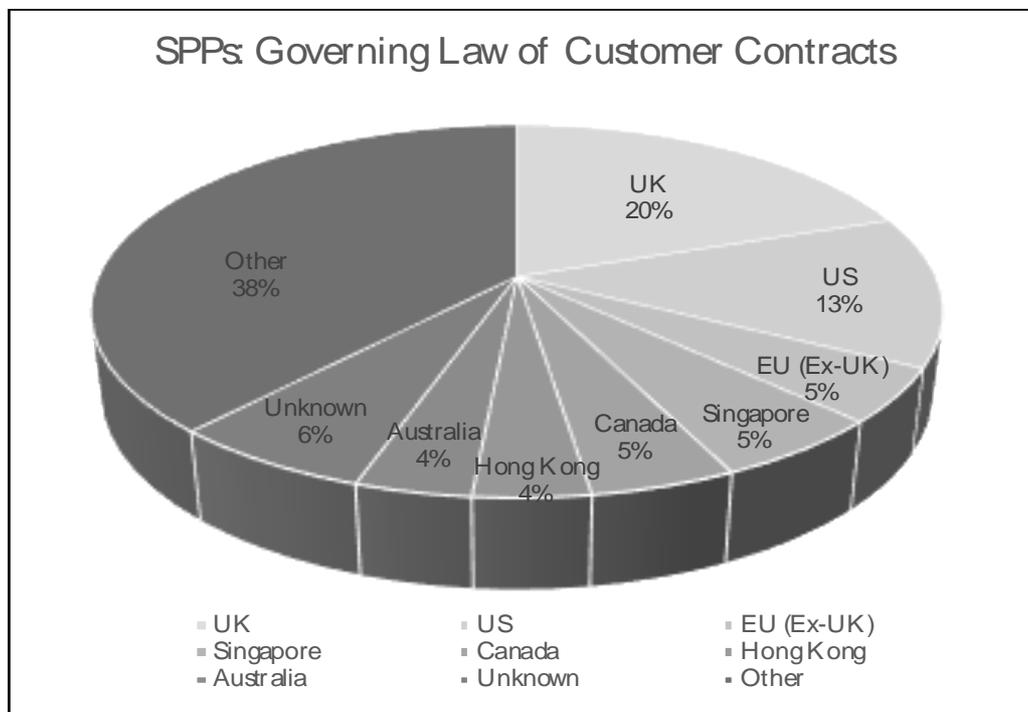
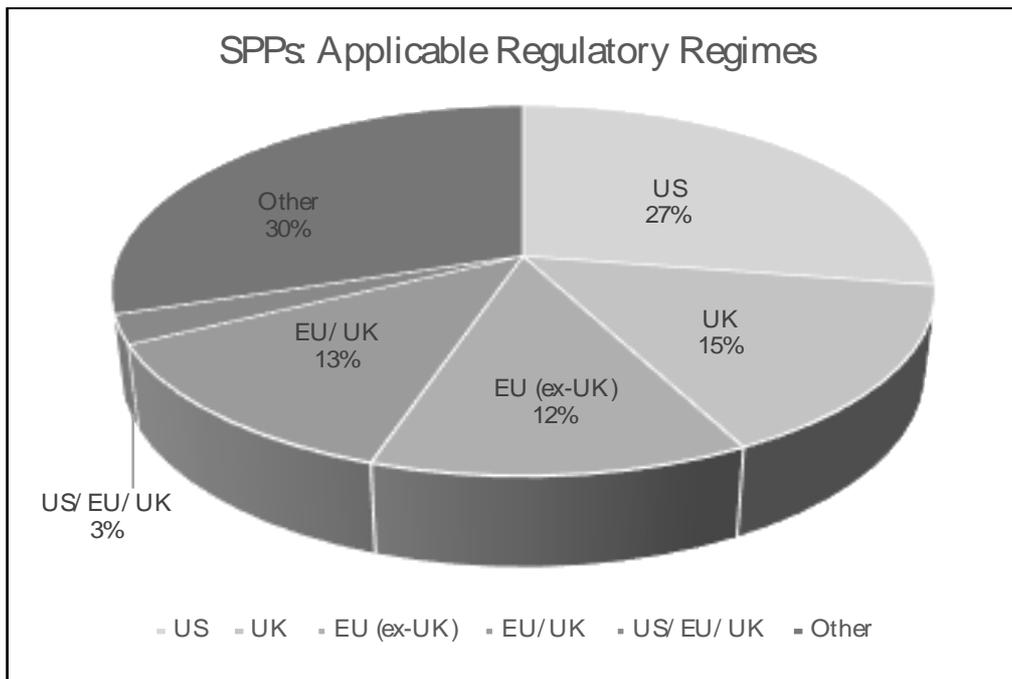


Figure 9 identifies the jurisdictions in which the SPPs in our sample are subject to authorization or licensing requirements under public regulatory frameworks. At present, not all the SPPs in our sample are caught within the scope of public regulatory frameworks governing the financial services industry, while others are subject to regulation in more than one jurisdiction. Out of the 40 SPPs in our sample that appear to be currently regulated (based on disclosure in customer contracts), 70% are regulated in the United States (27%), United Kingdom (15%), other EU member states (12%), or some combination thereof (16%). Money remittance platforms (90%) are the most likely to be subject to public regulation, while cryptocurrency exchanges (15%) are the least likely to be regulated.

Figure 9



This preliminary mapping exercise holds out a number of valuable insights into the legal geography of the shadow payment system. First, despite the fact that almost none of the largest SPPs are domiciled or do business in these jurisdictions, the United States, United Kingdom, and EU are home to a significant number of SPPs. The laws of these jurisdictions also govern almost 40% of all the customer contracts in our sample. Second, it is often far from clear what the legal entities are that customers are dealing with, where they are incorporated, and what laws govern their contractual relations. Almost inevitably, this makes it harder for customers to understand and enforce their legal rights. As we shall see, these insights have important implications in terms of measuring the level of consumer protection within the shadow payment system.

IV. Measuring Consumer Protection in the Shadow Payment System

The taxonomy of SPPs developed in Part III yields a useful framework for evaluating and comparing the risks posed by different business models. The most significant consumer protection risks are posed by proprietary P2P payment platforms, mobile money platforms, and centralized cryptocurrency exchanges that combine the promise of rapid and secure transfer with the possibility of longer term custody. This is followed by money remittance platforms that, while also performing basic transfer

functions, contemplate only very short-term custody of customer funds. And at the other end of the spectrum, bank-based P2P payment and money remittance platforms, along with decentralized cryptocurrency exchanges, do not perform any custody function whatsoever and, as a consequence, pose virtually no risk of illiquidity or loss of value in the event of an SPP's insolvency.

For those business models that do pose significant consumer protection risks, the first question becomes whether individual SPPs utilize private law mechanisms that serve to insulate customers from the impact of corporate insolvency. In theory, SPPs can protect their customers against the risks of illiquidity and loss of value in a variety of different ways: including disclosure, trusts, portfolio restrictions, third party insurance, and the structural separation of payment functions. These mechanisms, how they can protect customers, and the extent of their current use within the shadow payment system are described in Part IV.A. Importantly, the judicious combination of these mechanisms—and specifically structural separation, portfolio restrictions, and trusts—can theoretically provide a level of consumer protection that is broadly equivalent to that enjoyed by bank depositors. By the same token, the use of these mechanisms presents SPPs with a potentially significant trade-off insofar as it constrains their ability to profit from the intermediation of customer funds. As we shall see, this trade-off is reflected in the fact that, at present, these mechanisms are not widely used within large parts of the shadow payment system.

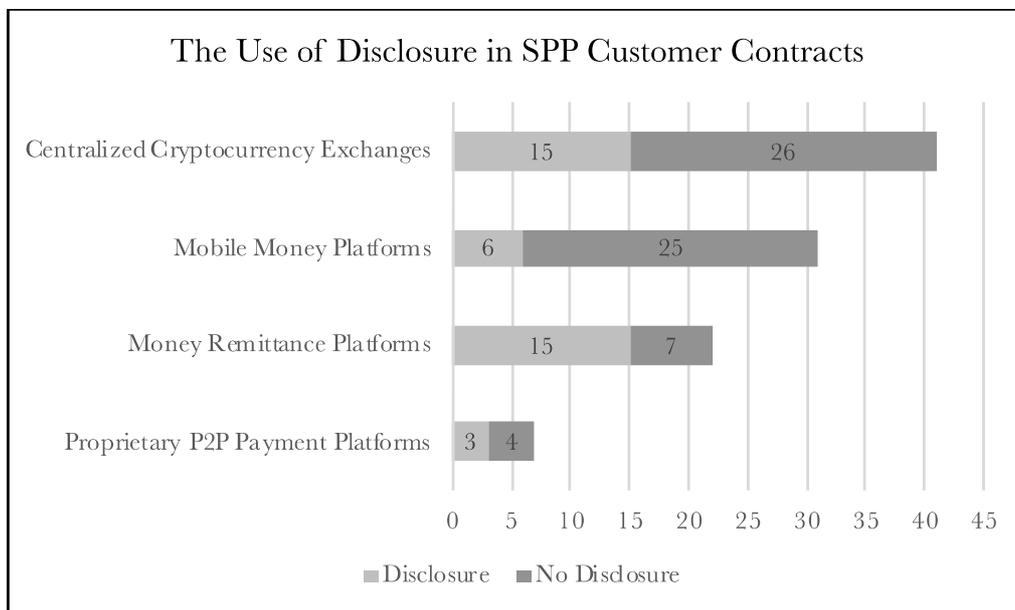
Where these private law mechanisms fail to adequately protect customers against the risks of SPP insolvency, there exists a potentially compelling rationale for public regulatory intervention. Part IV.B describes the applicable regulatory frameworks in three jurisdictions at the heart of the emerging shadow payment system—the United States, United Kingdom and China—and evaluates the extent to which they protect SPP customers from the risks of illiquidity and loss of value. Whereas the regulatory framework in the United States relies predominantly on a patchwork collection of often antiquated state-level money transmitter laws, the United Kingdom has recently adopted a new regulatory framework that, on its face, is designed to meet the challenges posed by 21st century payment systems. Regrettably, our examination of these frameworks reveals that they both fail to provide SPP customers with a level of protection equivalent to that enjoyed by bank depositors. This stands in

sharp contrast with China, where the People’s Bank of China (PBOC) has recently brought the largest SPPs from its burgeoning shadow payment system into the perimeter of conventional bank regulation.

A. Private Law Protections

We can think of the private law mechanisms for protecting SPP consumers as residing along a spectrum from the least to most costly. From the perspective of SPPs, the least costly mechanism is *disclosure* of the potential impact of insolvency on the firm’s ability to perform core payment functions. PayPal’s U.S. user agreement, for example, makes it clear that customer funds represent an unsecured claim against the firm and are not protected by FDIC deposit insurance.⁵⁷ Other SPPs describe in even more explicit terms the risks that customers face in the event of their insolvency.⁵⁸ Predictably, the low cost of disclosure is reflected in its relative popularity: with over 38% of the SPP customer contracts in our sample providing some level of disclosure around the risks of illiquidity and/or loss of value (see Figure 10).

Figure 10



Ultimately, of course, disclosure is only designed to warn customers of the potential risks: it does not actually protect customer funds in the event of an SPP’s

⁵⁷ PayPal Account User Agreement, page 4.

⁵⁸ Bitso and eToro Europe being two prominent examples from our sample.

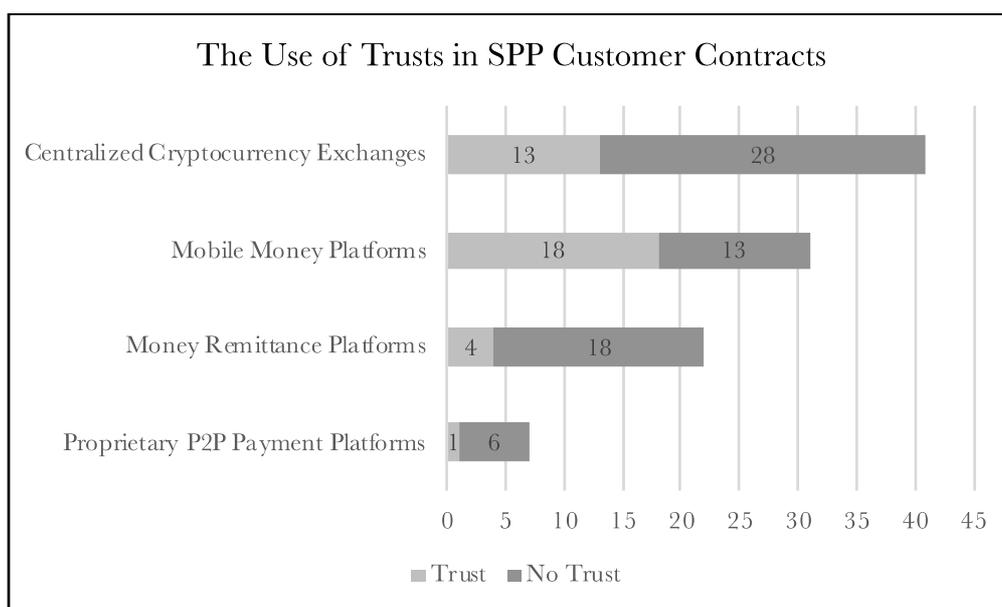
insolvency. One mechanism for doing so is the use of *trusts*.⁵⁹ The upfront costs of establishing trust arrangements designed to protect customer funds are relatively modest, with SPPs simply needing to comply with any substantive or procedural formalities in the relevant jurisdiction.⁶⁰ Once established, trusts can then effectively ring-fence customer funds in the event of an SPP's insolvency—thus preventing them from distribution to the firm's other creditors. Simultaneously, however, the relatively high back end costs of validating and enforcing trusts can interfere with the performance of core payment functions. Specifically, in many jurisdictions, the application of any automatic stay or other procedural obstacles on enforcement action may serve to prevent trust beneficiaries—customers—from exercising their entitlements until the conclusion of the insolvency process. Indeed, even in jurisdictions that do not impose significant procedural obstacles on the enforcement of proprietary claims, customers are likely to experience delays while the bankruptcy practitioner or court appointed to oversee the insolvency process confirms the existence of a valid trust, along with the identity and entitlements of trust beneficiaries.⁶¹ Accordingly, while trusts may be an effective mechanism for shielding customer funds from an SPP's other creditors, this protection comes at the expense of a customer's ability to freely transfer or convert deposited funds on demand. Despite these potential drawbacks, our data suggests that—like disclosure—trust arrangements are at present used with some degree of frequency within the shadow payment system, particularly by mobile-money platforms (see Figure 11).

⁵⁹ See for example, Ross Buckley & Jonathan Greenacre, *Using Trusts to Protect Mobile Money Customers*, SINGAPORE J. OF LEGAL STUD. 59 (July 2014).

⁶⁰ Perhaps most importantly, the SPP will need to ensure that the trust arrangements are not susceptible to being unwound by the application of the transaction avoidance rules that apply on the commencement of insolvency proceedings.

⁶¹ The costs incurred by the bankruptcy practitioner may also be chargeable to trust assets.

Figure 11

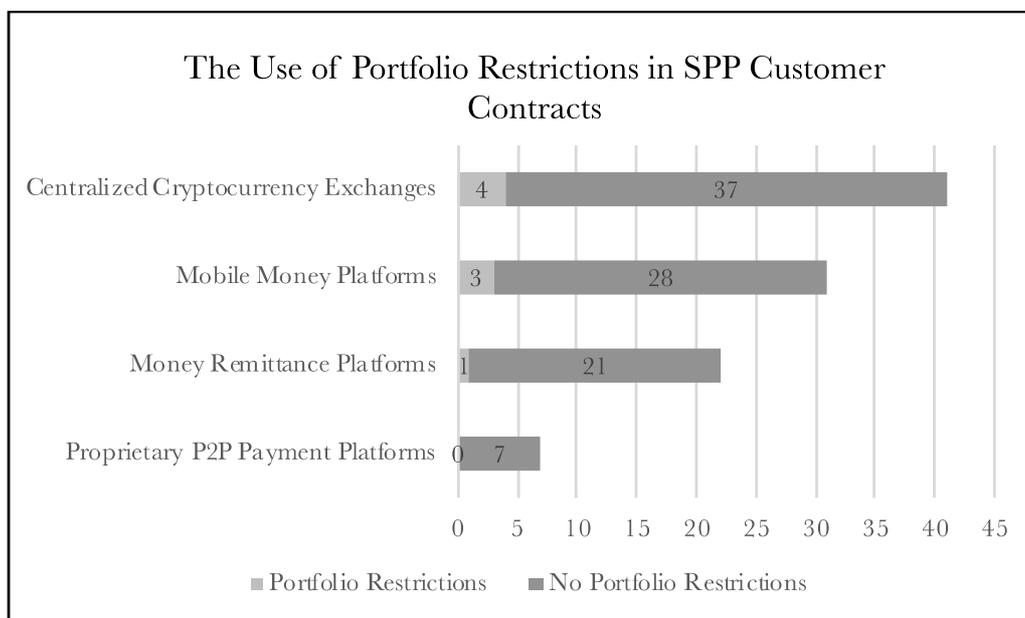


A second frequently identified mechanism for protecting customers is the imposition of *portfolio restrictions*. Portfolio restrictions limit the types of assets in which SPPs can invest customer funds: typically to cash, cash equivalents, and other money market instruments.⁶² By ensuring that SPPs maintain a sufficient stock of highly liquid, low volatility assets, portfolio restrictions are designed to reduce the probability that firms will experience liquidity and/or solvency problems that might undermine their ability to honour customer transfer or conversion requests. However, while these restrictions may help reduce the probability of financial distress, they ultimately do very little to protect customer funds once an SPP actually enters into an insolvency proceeding. Most importantly, portfolio restrictions do not ring-fence customer funds from the remainder of an insolvent firm’s estate—thereby leaving customers exposed to potential loss of value during the insolvency process. By prescribing the type of assets in which SPPs are permitted to invest, portfolio restrictions also limit their ability to generate profits from the intermediation of customer funds. As a result, it is perhaps unsurprising that portfolio restrictions are generally used less frequently than either disclosure or trusts in SPP customer contracts (see Figure 12). One notable exception here is mobile money platforms, where maintaining a 1:1 relationship between the value of deposited funds and e-money is often considered essential to their credibility.

⁶² A similar strategy involves depositing customer funds in a conventional bank account.

In this respect, it is somewhat concerning that only three of the 31 of the mobile money platforms in our sample include a specific reference to portfolio restrictions in their contractual documentation.

Figure 12



A third and potentially even more effective mechanism for protecting customers is *structural separation*. While structural separation can take many different forms, the basic strategy involves the performance of core payment functions through a dedicated bankruptcy-remote subsidiary, thereby ring-fencing customer funds in the event of the parent firm’s insolvency. This ring-fenced subsidiary would then need to be prevented from assuming any liabilities not directly connected to its core payment functions.⁶³ Structural separation can be viewed as potentially superior to trusts and portfolio restrictions in at least two respects. First, because a ring-fenced subsidiary would be able to continue to meet its commitments to customers in the event of its parent’s insolvency, customers would face little or no risk of illiquidity or loss of value stemming from an SPP’s wider business activities. Secondly, compared with a declaration of trust by the main operating company, structural separation seems less vulnerable to being attacked by the application of transaction avoidance rules when the operating company enters into insolvency proceedings. In theory, structural separation can thus enhance

⁶³ Alternatively, SPPs could ensure that any such liabilities were deeply subordinated to customer claims.

certainty and promote greater confidence in the ability of an SPP to perform core payment functions during periods of institutional distress.

Structural separation does not itself limit the ability of a ring-fenced subsidiary to make risky investments with customer funds. Nevertheless, strict structural separation does prevent the parent firm from employing leverage at the subsidiary level: thereby limiting its ability to profit from the intermediation of customer funds. These potentially significant costs are reflected in the fact that only a handful of firms in our sample—including M-Pesa's operations in Kenya, Tanzania, and Lesotho—currently employ structural separation.

Instead of relying on private law mechanisms such as disclosure, portfolio restrictions, trusts, or structural separation, SPPs could conceivably seek to protect customers through market-based mechanisms such as *insurance*. This insurance would be designed to ensure that there is at all times a credible third party that is contractually obligated to provide customers with liquidity in the event of an SPP's insolvency. By stepping into the shoes of the SPP, the insurer would thus effectively serve as a private deposit guarantee scheme. In theory, insurance could insulate customers from the risk of both illiquidity and loss of value. In practice, however, the effectiveness of this insurance is likely to depend on a variety of different factors. The first is the willingness of third parties to actually provide this insurance. New forms of insurance are notoriously difficult to structure and price. Any first mover advantages are also likely to be short-lived insofar as subsequent entrants are able to free-ride off the structure, pricing, and claims information generated by earlier entrants.

Another important factor is the probability of correlated default by both the SPP and insurer. This joint probability of default is likely to be a function of at least two variables. The first is the size of the SPP as measured by the quantum of insured customer funds relative to the liquid assets of the insurer. The larger the SPP, the more likely that its insolvency would place demands on the insurer that could threaten its own liquidity or solvency. The second is the interconnectedness of the SPP with the broader financial system. The higher the level of interconnectedness, the greater the probability that the SPP and insurer would simultaneously come under pressure in the context of a more systemic liquidity crisis. Accordingly, as the size and interconnectedness of an SPP increases, we would expect a corresponding decrease in

the credibility of the insurer's commitment to provide the necessary insurance. This, in turn, highlights the potential Achilles' heel of this strategy: the bigger and more important the SPP becomes, the less effective insurance is likely to be as a mechanism for protecting consumers. At present, however, only two SPPs in our sample—cryptocurrency exchanges Gemini and Independent Reserve—have elected to employ this strategy.

What this examination makes clear is that there is no silver bullet—no single mechanism that can completely protect customers from the risks of illiquidity and loss of value.

Nevertheless, by combining these mechanisms, SPPs can theoretically provide customers with a level of protection similar to that enjoyed by bank depositors. The starting point would be the structural separation of core payment functions within a dedicated bankruptcy-remote subsidiary in order to ensure that customers were not exposed to the insolvency and other risks stemming from an SPP's wider business activities. To ensure that the subsidiary was able to fulfil customer transfer and liquidity demands, it would then need to be subject to portfolio restrictions limiting its investments to cash, cash equivalents, or other money market instruments. Funds could also be deposited in an account in the customer's name at a conventional deposit-taking bank. Where customer funds remain in the subsidiary, meanwhile, the SPP could use trust arrangements to ring-fence these funds from competing creditors in the unlikely event of the subsidiary's insolvency. Together, these mechanisms would come very close to replicating the unique protections typically afforded bank depositors. At the same time, of course, this elaborate legal architecture would come with some very significant costs: essentially preventing SPPs from using customer funds as the basis for more profitable forms of financial intermediation.⁶⁴ It is perhaps not surprising, therefore, that only one SPP—Kenya's M-Pesa—currently combines these three mechanisms.

⁶⁴ Other than any interest or returns on assets in the ring-fenced portfolio.

Figure 13

Use of Private Law Mechanisms by SPPs

Type of SPP	Mechanism				
	Disclosure	Trusts	Portfolio Restrictions	Structural Separation	Insurance
Centralized cryptocurrency exchanges (n=41)	15(37%)	13 (32%)	6 (15%)	0 (0%)	2 (5%)
Money remittance platforms (n=22)	15 (68%)	4 (18%)	1 (5%)	0 (0%)	0 (0%)
Mobile money platforms (n=31)	6 (19%)	18 (58%)	3 (10%)	7 (23%)	0 (0%)
Proprietary P2P platforms (n=7)	3 (43%)	1 (14%)	0 (0%)	0 (0%)	0 (0%)

Our examination of SPP business models and customer contracts suggests that customers generally enjoy relatively limited structural, contractual, or other private legal protections (see Figure 13). This, in turn, puts enormous pressure on public regulatory frameworks to ensure a sufficient level of consumer protection. In the next section, we examine the relevant regimes in the United States and United Kingdom with a view to determining whether they provide a level of protection that is broadly comparable to that typically enjoyed by bank depositors. We also compare these regimes with recent developments in China, where the PBOC has taken significant steps to rein in its rapidly expanding shadow payment system.

B. Public Regulatory Regimes

In Part III, we mapped out the basic legal geography of the shadow payment system. This mapping exercise yielded important new information about where SPPs are domiciled and, crucially, regulated. Perhaps most importantly, it revealed that the legal centre of gravity for this evolving financial ecosystem is the United States, United Kingdom, and EU. Indeed, 70% of the SPPs in our sample that are currently regulated are domiciled and/or subject to regulation in one or more of these jurisdictions. The question thus becomes: do the applicable regulatory regimes in these jurisdictions compensate for the failure of private ordering to provide SPP customers with a similar level of protection to that typically enjoyed by bank depositors?

(i) The United States

In the United States, SPPs are generally subject to one of two regulatory regimes. The first consists of a patchwork of federal and state-level money transmitter regulations. Under federal law, it is illegal to conduct, control, manage, supervise, direct, or own an unlicensed money transmitting business.⁶⁵ For these purposes, the definition of a money transmitting business is cast extremely broadly to include any business “transferring funds on behalf of the public by any and all means including but not limited to transfers... by wire, check, draft, facsimile, or courier.”⁶⁶ This definition notably covers the vast majority of SPPs other than cryptocurrency exchanges⁶⁷: including major players such as PayPal, Circle, and Transferwise.

All money transmitting businesses operating in the United States are required to register with the Secretary of the Treasury.⁶⁸ This registration requirement serves to bring these firms within the perimeter of the Treasury Department’s Financial Crimes Enforcement Network (FinCEN). Registered firms are then subject to both federal consumer protection laws and state-level licensing requirements and regulation. At the federal level, the principal regulatory strategy for protecting customers is disclosure: with registered firms required, amongst other things, to provide customers with information about applicable fees, taxes, and exchange rates, the expected timeframe for the delivery of transferred funds, and instructions regarding payment cancellation and error resolution.⁶⁹

At the state level, meanwhile, the applicable regulatory regimes employ a number of mechanisms to protect customers from the risks of illiquidity and loss of value. The first includes surety bonds, letters of credit, bank deposits, and other mechanisms designed to ensure that registered firms maintain a minimum amount of assets available for distribution to creditors in the event of their insolvency. These

⁶⁵ 18 U.S.C. § 1960

⁶⁶ 18 U.S.C. § 1960(B)(2). The registration requirements themselves define money transmitting business slightly differently as any business other than a depository institution that “provides check cashing, currency exchange, or money transmitting or remittance services, or issues or redeems money orders, travellers’ checks, and other similar instruments or any other person who engages as a business in the transmission of funds, including any person who engages as a business in an informal money transfer system or any network of people who engage as a business in facilitating the transfer of money domestically or internationally outside of the conventional financial institutions system.”

⁶⁷ Although some states, New York and Connecticut for example, have granted registration to cryptocurrency exchanges.

⁶⁸ 31 U.S.C. § 5330.

⁶⁹ 12 C.F.R. § 1005.31(b).

requirements, which are often linked to payment volumes or the number of physical locations within the relevant state, range from a minimum of \$10,000 (Georgia, Hawaii, Idaho, Nevada, Washington, and Wisconsin) to a maximum of \$7 million (California). The second mechanism consists of portfolio restrictions requiring each registered firm to at all times hold “permissible investments” equal to 100% of its outstanding payment obligations. The third involves the use of statutory trusts in favour of customers for the purpose of ring-fencing permissible investments from a firm’s other creditors. Figure 14 summarizes the use of each of these mechanisms within state-level money transmitter regulation.

Figure 14

Consumer Protection Mechanisms Used in State Money Transmitter Regulation

Mechanism	Number of States Employing Mechanism (%)
Surety bond, letter of credit, bank deposit, or equivalent	49/50 (98%)
Portfolio restrictions (permissible investments)	38/50 (74%)
Permissible investments held in trust	30/50 (60%)
All three mechanisms together	30/50 (60%)

While useful in many important respects, these mechanisms fail to completely protect customers from the impact of insolvency on an SPP’s ability to perform core payment functions. First, insofar as they fail to accurately reflect the volume of outstanding payment obligations at the moment of insolvency, surety bond requirements based on either a fixed amount or the number of physical locations do not guarantee that sufficient assets will be available to fully repay customers. In the absence of a statutory trust, customers may also be forced to compete for these assets with an insolvent SPP’s other creditors. Second, while every state other than Montana requires registered firms to post a surety bond, letter of credit, or equivalent instrument, over 25% of states do not impose portfolio restrictions around the use of customer funds, and 40% do not ring-fence permissible investments within a statutory trust. This exposes customers to the risk that SPPs will invest their funds in volatile and potentially illiquid assets, and that the proceeds from the sale of these assets may be distributed to other creditors in the event of an SPP’s insolvency.

Remarkably, even where state law imposes portfolio restrictions and statutory trusts, customers may still be exposed to potential illiquidity and loss of value. As a preliminary matter, neither of these mechanisms protect customers from any delays in repayment associated with the insolvency process. Even more importantly, the definition of permissible investments in many states is extremely broad. As described above, in order to ensure sufficient liquidity and protect customers from potential loss of value, permitted investments should be restricted to cash, cash equivalents, and other highly liquid money market instruments. This logic is notably reflected in the U.S. Securities and Exchange Commission’s approach to the regulation of money market mutual funds: where the obligation to redeem customer funds at a fixed net asset value has historically been seen as justifying the imposition of relatively tight portfolio restrictions.⁷⁰ In the context of money transmitter regulation, however, the majority of states that impose portfolio restrictions permit registered firms to invest in a far broader range of assets: including investment grade corporate debt (34 states), non-investment grade corporate debt (30 states), publicly-listed shares and/or equity mutual funds (27 states) and, in several cases, even accounts receivable owed to a registered firm by its authorized delegates or affiliates (see Figure 15).

Figure 15

Scope of Permissible Investments under State Money Transmitter Laws

Permissible Investments	States Allowing (%)
Cash, cash equivalents, and money market instruments <u>only</u>	4/50 (8%)
Investment grade corporate debt	34/50 (68%)
Non-investment grade corporate debt/debt mutual funds (with no restrictions)	21/50 (42%)
Non-investment grade corporate debt/debt mutual funds (with % restrictions)	9/50 (18%)
Publicly-listed shares/equity mutual funds (with no restrictions)	16/50 (32%)
Publicly-listed shares/equity mutual funds (with % restrictions)	11/50 (22%)
Receivables from affiliates/delegates/vendors/sellers	13/50 (26%)
No restrictions	12/50 (24%)

⁷⁰ See SEC Rule 2a-7.

Once we include states that do not impose any restrictions on permissible investments, fully 46 states permit registered firms to invest in corporate debt, while 39 permit investments in publicly-listed shares. The problem, of course, is that the price of publicly-listed shares and corporate debt can be highly volatile: thereby exposing registered firms to the prospect that the value of their investment portfolios may at times be less than their outstanding payment obligations. By increasing the risk of both balance sheet and cash flow insolvency, this volatility increases the risk that customers will experience a delay in transferring or converting deposited funds. Once in insolvency, this volatility also exposes customers to the risk that the value of the firm's investment portfolio will be insufficient to ensure full repayment. Viewed in this light, state money transmitter laws are a poor substitute for the legal protections typically enjoyed by bank depositors.

The second source of SPP regulation in the United States is a small but growing number of state level frameworks specifically targeting cryptocurrency exchanges. The first and arguably most stringent of these frameworks is New York State's "Bitlicense" regime.⁷¹ Adopted in June 2015 by the New York Department of Financial Services (NYDFS), the Bitlicense regime applies to all "virtual currency business activity" conducted by a firm involving either the state of New York, or any person residing, located, having a place of business, or conducting business therein.⁷² For these purposes, virtual currency business activity includes: receiving virtual currency for transmission; transmitting virtual currency; storing, holding, or maintaining custody or control of virtual currency on behalf of others; buying and selling virtual currency as a customer business; performing exchange services as a customer business; or controlling, administering, or issuing a virtual currency.⁷³

The New York Bitlicense regime subjects licensed firms to basic capital, reporting, recordkeeping, anti-money laundering, cyber-security, and other requirements. The regime also provides customers of licensed firms with a number of

⁷¹ 23 CRR-NY 200.

⁷² 23 CRR-NY 200.3.

⁷³ 23 CRR-NY 200.2. The regime also contemplates a number of exemptions: e.g. for banks chartered in New York that have been authorized to engage in virtual currency business activity and for merchants and customers that utilize virtual currency solely for the purchase or sale of goods or services or for investment purposes; 23 CRR-NY 200.3(c).

significant legal protections. Licensed firms are required to fully disclose all material risks: including the fact that virtual currencies are not legal tender, that customers are not protected by FDIC or other deposit guarantee schemes, and that mechanisms designed to protect customer assets may not be sufficient to completely cover all potential losses.⁷⁴ Licensed firms are also prohibited from engaging in fraudulent activity and from making false, misleading, or deceptive statements or omissions in their marketing materials.⁷⁵

The Bitlicense regime also includes a number of mechanisms specifically designed to protect customer assets in the event of a firm's insolvency. Licensed firms are required to maintain a surety bond or trust account in U.S. dollars for the benefit of customers in an amount acceptable to the NYDFS.⁷⁶ Where a licensed firm elects to use a trust account, this account must be maintained with a qualified third party custodian.⁷⁷ Licensed firms that store, hold, or maintain custody or control of virtual currency on behalf of a customer are also subject to portfolio restrictions requiring them to hold the same type and amount of currency as that owed by, or obligated to, that customer.⁷⁸ Licensed firms are then prohibited from selling, transferring, assigning, lending, hypothecating, pledging, or otherwise using or encumbering customer assets, except in connection with the sale, transfer, or assignment of these assets at the customer's direction.⁷⁹ Importantly, the regime does not contemplate that licensed firms can circumvent this broad prohibition via disclosure or customer consent.

The combination of third party surety bond/custody requirements, tight portfolio restrictions, and a prohibition against the use of customer assets arguably makes New York's Bitlicense regime the current gold standard in cryptocurrency regulation. Nevertheless, even this relatively new and highly bespoke regime does not provide customers with complete protection against the risks of illiquidity or loss of value: in particular where the surety bond/custody requirements prove insufficient to

⁷⁴ 23 CRR-NY 200.19(a).

⁷⁵ 23 CRR-NY 200.18(d) and 200.19(g). Registered firms must also take reasonable steps to detect and prevent fraud; *id.*

⁷⁶ 23 CRR-NY 200.9(a).

⁷⁷ 23 CRR-NY 200.9(a).

⁷⁸ 23 CRR-NY 2009(b).

⁷⁹ 23 CRR-NY 2009(c).

ensure full repayment, or where repayment is delayed in the context of any insolvency proceedings. At the same time, the Bitlicense regime effectively prohibits licensed firms from profiting from the intermediation of customer assets. This perhaps explains why, despite an explosion in the number of cryptocurrency exchanges, only a relatively small number of firms have thus far sought to obtain a Bitlicense: with only 18 firms registering under the new framework between June 2015 and May 2019. This highlights an important and familiar trade-off: while both private law and public regulation offer a range of different tools for protecting customers, the effective use of these tools can often undercut the economic incentives for firms to perform core payment functions.

(ii) The United Kingdom and EU

The starting point for understanding the United Kingdom and EU's approach toward the regulation of the shadow payment system is the European Union's 2009 E-Money Directive (EMD2) and 2015 Payment Services Directive (PSD2).⁸⁰ EMD2 applies to all "e-money institutions": firms that issue electronically stored monetary value in the form of claims on the issuer, which are issued on the receipt of funds for the purpose of making payment transactions, and which are accepted as a means of payment by persons other than the issuer itself.⁸¹ PSD2, meanwhile, applies to a wide range of firms including so-called "payment institutions" that are engaged in money remittance, enable customers to deposit or withdraw cash on account, or execute payment transactions.⁸² Between them, EMD2 and PSD2 thus cover the vast majority of SPPs other than cryptocurrency exchanges.

EMD2 and PSD2, along with the domestic regulations implementing these directives in the United Kingdom and other EU member states, impose detailed rules governing firm authorization, minimum capital, recordkeeping, financial reporting, outsourcing, and other matters.⁸³ The most important of these rules for our purposes

⁸⁰ Directive 2009/110/EC of the European Parliament and Council on the taking up, pursuit, and prudential supervision of the business of electronic money institutions (16 September 2009) [EMD2] and Directive 2015/2366 of the European Parliament and Council on payment services (25 November 2015) [PSD2].

⁸¹ EMD2, Article 2.1 and 2.

⁸² PSD2, Annex 1.

⁸³ United Kingdom Electronic Money Regulations 2011, No. 99 (19 January 2011) [UK EMR 2011] and United Kingdom Payment Services Regulations 2017, No. 752 (18 July 2017) [UK PSR 2017].

are those regarding the safeguarding of customer funds. Both EMD2 and PSD2 give authorized institutions two basic options. The first involves ring-fencing customer funds from those of the institution itself by either depositing them in a bank account designated for these purposes or investing them in high quality, liquid debt instruments held by a third party custodian.⁸⁴ The relevant rules then prohibit any person other than the authorized institution from having a right or interest in these funds/assets⁸⁵, and require an institution to ensure that they are insulated against the claims of its other creditors in the event of insolvency.⁸⁶

The second option involves authorized institutions taking out an insurance policy or guarantee from an unaffiliated bank or insurance company. This insurance policy or guarantee must be in the amount of the authorized institution's outstanding obligations to its customers and be payable in the event of its default or insolvency.⁸⁷ The proceeds of the insurance policy or guarantee must be payable into a bank account designated exclusively for the purposes of safeguarding customer funds. The rules then prohibit any person other than the institution itself from having any right or interest in the proceeds deposited into this account.⁸⁸

On the surface, EMD2, PSD2, and their associated regulations provide customers with a relatively high degree of protection against an SPP's insolvency. In particular, the strategy of ring-fencing customer funds with a third party bank or custodian all but eliminates the prospect that customers will experience a nominal loss on these funds. Customers also benefit from a carveout from rules that would otherwise require them to contribute alongside other creditors to the expenses of an insolvency proceeding.⁸⁹

Upon closer inspection, however, these protections are far from watertight. First, the option of obtaining an insurance policy or third party guarantee—assuming it is even available—simply trades the insolvency risk of an SPP for that of the relevant bank

⁸⁴ PSD2, Article 10(1)(a); UK PSR 2017, Articles 23(5)-(11); EMR2, Article 7(1), and UK EMR 2011, Article 21(2)(b).

⁸⁵ UK PSR 2017, Article 23(8) and UK EMR, 21(4).

⁸⁶ PSD2, Article 10(a) and UK EMR 2011, Article 24(1)(a)-(b).

⁸⁷ PSD2, Article 10(1)(b); UK PSR 2017, Articles 23(12)-(15); EMR2, Article 7(1), and UK EMR 2011, Article 22(1).

⁸⁸ UK PSR 2017, Article 23(13) and UK EMR 2011, Article 22(2).

⁸⁹ Other than the costs relating to the distribution of customer funds; UK PSR 2017, Article 23(15) and UK EMR 2011, Article 24(2).

or insurance company. Yet as painfully illustrated by the global financial crisis, we should not take the solvency of these institutions for granted—especially where the liquidity or solvency pressures on SPPs are correlated with more widespread financial instability. Second, SPPs have strong incentives to purchase the least costly—i.e. most contingent—insurance policies and guarantees. Once an SPP has been declared insolvent, meanwhile, banks and insurance companies have strong incentives to exploit these contingencies in order to wriggle out of their commitments.

Arguably more pressing, however, is the risk that customers will experience a delay in the repayment of funds during the insolvency process. As a preliminary matter, unlike most deposit guarantee schemes, neither the EMD2 and PSD2 regimes impose an affirmative obligation on banks, custodians, or insurance companies to pay customers within a specified timeframe. Along the same vein, we should not simply assume that SPPs will successfully implement these safeguarding requirements. Indeed, regulatory authorities in the United Kingdom have a history of failing to ensure full compliance with ring-fencing rules—leading to complex and costly litigation and predictable delays in the repayment of customer funds.⁹⁰ Accordingly, while EMD2 and PSD2 may protect customers against significant loss of value, they do not completely insulate them from potential illiquidity during the insolvency process.

(iii) China

We can contrast the regulatory regimes in the United States, United Kingdom and EU with the recent decision of the PBOC to bring proprietary P2P payment platforms such as Alipay and WeChat Pay within the perimeter of conventional banking regulation. In January 2017, the PBOC announced that it was requiring these and other SPPs to maintain 20% of customer funds in a single, dedicated, non-interest bearing custodial account at a commercial bank.⁹¹ In April 2018, the PBOC then increased this reserve requirement to 50% and, effective 1 January 2019, 100% of the funds deposited by Chinese customers must now be held in a reserve account with the PBOC itself.⁹²

⁹⁰ See *In the matter of Lehman Brothers International (Europe) (In Administration) and in the matter of the Insolvency Act 1986* [2012] UKSC 6.

⁹¹ See Gabriel Wildau and Yizhen Jai, “Central Bank Takes Steps to ensure Ant Financial and Tencent Do Not Grow Too Powerful”, *Financial Times* (1 January 2019).

⁹² *Id.*

It has been estimated that the PBOC's decision will cost Ant Financial and Tencent (the owners of Alipay and WeChat Pay, respectively) over \$1USD billion in lost interest income.⁹³ On one level, this might seem like something of a draconian move, one likely to stifle further innovation. On another level, however, this move simply reflects the PBOC's tacit acknowledgement of the fundamental insight at the heart of this paper: that the consumer protection and other problems associated with the emergence of SPPs stem largely from the fact that they reside outside the perimeter of conventional bank regulation. By taking a page out of this regulation, the PBOC has thus provided customers with a far higher degree of legal protection against default or insolvency, without forcing them—at least in the short term—to sacrifice the convenience, security, and other features that these platforms provide.

* * *

The United States, United Kingdom, and EU are often held out as having some of the most sophisticated regulatory frameworks in the financial world. Predictably, however, the pace of innovation within the shadow payment system has left the regulatory frameworks in these jurisdictions struggling to protect customers against the myriad of risks posed by the emergence and rapid growth of the shadow payment system. Ultimately, the failure of these frameworks to fully protect customers in the event of an SPP's insolvency undermines the case that these new institutions should be viewed as effective substitutes for conventional bank-based payment systems. The question for policymakers is whether they should invest in the development of functionally equivalent regulatory frameworks, or—as China has recently done—bring these institutions within the perimeter of the regulated banking system.

V. Policy Implications

Our findings have a number of important policy implications:

- As the name implies, the shadow payment system exists largely in the shadows. We faced significant obstacles in identifying even basic legal information for many SPPs, let alone the more granular corporate, contractual, and other information needed to measure current levels of consumer protection. These

⁹³ Id.

information gaps are important from a consumer protection perspective. They are also important for policymakers as they seek to enhance their oversight of these increasingly important institutions.

- The majority of SPPs have not taken full advantage of private law mechanisms to protect customers from the risks of potential illiquidity and loss of value. This is not surprising given the impact of these mechanisms on the ability of SPPs to profit from the intermediation of customer funds.
- Regulation is an important part of what makes the promise of banks to perform core payment functions credible. If SPPs are to compete with banks on a level playing field, policymakers will need to ensure that the regulatory regimes that govern them provide a functionally equivalent level of consumer protection. While existing regulatory regimes in the United States, United Kingdom and EU provide some protection, these regimes fall short of this standard.
- Effective regulatory regimes governing SPPs need not include all the features of conventional bank regulation. Nor need they involve access to central bank reserve accounts as China has recently mandated. While we propose a bespoke regulatory regime that combines structural separation, portfolio restrictions, and trusts, there may be other potentially effective options depending on the relevant business models and underlying legal frameworks.
- SPPs and their representatives may object to the imposition of functionally equivalent regulatory regimes on the basis that they would constrain their ability to profit from the intermediation of customer funds. Ultimately, however, absent an important and pressing policy rationale, combining payment functions with financial intermediation poses well understood risks that require strict prudential regulation.

Conclusion

This paper represents our first tentative steps towards a better understanding of the shadow payment system. Our exploration uncovered a world characterized by heterogeneity, complexity, uncertainty—and risk. Our preliminary findings suggest that policymakers face some hard choices about how to balance technological innovation, competition, and consumer protection within this rapidly evolving system. In general, private ordering has proven insufficient to ensure that customers benefit from a level of protection equivalent to that typically enjoyed by bank depositors. Accordingly, as the system continues to grow, so too will the pressure on policymakers to ensure the effective regulation of SPPs. While this regulation need not be as sophisticated or burdensome as conventional bank regulation, it must nevertheless seek to ensure that SPPs can continue to perform their core payment functions during periods of institutional distress and insolvency. Only then will these institutions be able to compete on a level playing field with conventional deposit-taking banks.

Appendix: Methodology

The ambitious, global scope of this research project presented us with a number of methodological challenges. One of the most important challenges was identifying the global population of SPPs. Our search strategy began by identifying well-known SPPs in each category. Using financial databases and other media and industry sources, we then identified the primary competitors to these firms across different jurisdictions and markets. This strategy was then repeated using these newly identified SPPs until no new competitors were identified. We also attended a number of industry conferences for the purpose of identifying new SPPs and products.

One important limitation of our research strategy is that the media, industry, and other resources we used to identify SPPs were entirely in the English language. As a result, it is extremely likely that our sample is under-representative of SPPs that provide payment services exclusively in the non-English speaking world. For this reason, it may also be the case that our sample is over-representative of legal mechanisms prevalent in the English-speaking—and predominantly common law—world (e.g. trusts). Our hope is that researchers fluent in other languages will take this research forward and identify and examine SPPs falling outside of our sample.

Another limitation of our research strategy stems from the incompleteness of many corporate and regulatory databases and our resulting inability to completely map the legal geography of the shadow payment system. Where not specifically referenced in marketing materials or customer contracts, it was often difficult to identify an SPP's jurisdiction of incorporation. While incorporation databases exist in many countries, it was often difficult to definitively determine whether a corporation with a name similar to that of an SSP in our database was the correct corporation. These difficulties were exacerbated by the existence of corporations with similar (or even identical) names in different jurisdictions. Along a similar vein, with the notable exception of the US and UK, many jurisdictions do not have a consolidated public database that would enable the identification and confirmation of regulated SPPs.

Lastly, ambiguities and inconsistencies in the customer contracts and other materials at the heart of our study presented us with a number of interpretive challenges. Many of the customer contracts in our sample were poorly written and did not always evidence a firm grasp of basic legal principles. As a result, it was sometimes difficult to clearly determine the intent of the parties in designing a particular mechanism. Where these ambiguities or inconsistencies exist, we only included a mechanism in our count where both researchers were reasonably satisfied that it fell into one of our five categories (disclosure, trusts, portfolio restrictions, structural separation, and insurance). Ultimately, however, given the number of jurisdictions involved in our study, combined with our lack of expertise in the legal systems of many of these jurisdictions, there is inevitably room for error in our identification and categorization of different mechanisms.