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Privacy Provision, Payment Latency, and Role of Collateral

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Abstract

The new boundary between publicly and privately provided payments systems and the role of collateral may be changing. Recent technological developments have made it feasible for markets and policymakers to contemplate abolishing physical cash, and replacing it with electronic alternatives like digital tokens. This paper focuses on two concepts: (i) privacy provision that results in increased awareness of and concern with problems of privacy in payments systems; and (ii) payment latency, and how the new fintech world is likely to result in reduced counterparty and interest rate risk for corporate treasurer. The paper ties these issues from the lens of collateral, especially the analogy of collateral reuse and digital tokens.

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I. INTRODUCTION

The new boundary between publicly and privately provided payments systems and the role of collateral may be changing. Fintech—the convergence of technologies including artificial intelligence and big data, distributed computing, cryptography, the internet and mobile access—has led to a variety of applications in the financial industry, prime among them being the development of new payment systems. These technological developments have made it feasible for policymakers to contemplate the possibility of abolishing physical cash, replacing it with electronic alternatives like digital tokens. This paper focuses on two concepts: privacy provision and payment latency. Section II is about privacy provision; technological developments have led to an increased awareness of and concern with problems of privacy in payments systems. Section III is on payment latency and how the new fintech world may result in reduced counterparty and interest rate risk for corporate treasurers who interface banks. Section IV concludes by tying the above themes from the lens of collateral and the analogy of collateral reuse and digital tokens.

II. PRIVACY PROVISION

Arguments that have been made by regulators attempting to reduce the use of cash has been that the privacy it provides facilitates illegal activity. But there are other legitimate sources of demand for privacy in payments. The first is for protection from the counterparty to the transaction. (Kahn, McAndrews, and Roberds, 2005.) There are cases where an individual makes a legitimate transaction with a stranger but wants to ensure that no ancillary consequences arise from the transaction: for example, if the transaction signals that the individual is wealthy or if publicity from the transaction is embarrassing (some medicines for example). Besides concerns about the counterparty's actions there can be concerns about misuse of information by third parties—leading to worry as to whether the system operator is taking adequate care of the privacy of the parties in the transaction, or indeed exploiting the information itself (Kahn, St Louis Fed, 2018).

These technological and policy considerations have led to an important question: to what extent should new electronic payment arrangements be controlled by public authorities (so-called "central bank digital currencies," (CBDCs)) and to what extent should they be under the purview of private operators? While publicity regarding data security breaches has increased awareness of the problem for both the public and policymakers, it has also led to questions regarding central banks' ability to provide privacy protection.

Among the private systems that have proliferated or been proposed, some—notably cryptocurrencies like Bitcoin—have been designed to operate as a fiat currency independent of all outside authorities. Others have taken the form of "stable coins"—payments media tied to existing units of account and backed to some degree by assets linked to those units of account, such as precious metals or fiat currencies.

The organisers of a stable coin are in a similar position to a "narrow bank." On the liability side of their balance sheets is a liquid instrument that others find convenient to hold. Because of the liquidity the holders are willing to accept a low or even slightly negative rate of interest. But since ready redemption is promised it is necessary to hold liquid assets in

sufficient quantity to maintain users' confidence in the ability to redeem. If the stable coin provides its holders sufficiently greater convenience than the asset for which it can be redeemed, then there is room for the payment system provider to make a profit on the difference between return paid (or charged) on the stable coin and the return on the reserves held against it. If this margin is too small, or if the possibility of additional yield becomes too tempting, then the service provider will be induced into a fractional reserve arrangement. When the provider holds as reserves less than the full value of coins it has issued, the question arises: how much to hold and what quality to maintain in the portfolio of non-reserve holdings, in terms of both risk and liquidity? A related question is the matter of custodianship of the assets of the system: should their rehypothecation be permitted and under what circumstances? Various stable coins and stable coin proposals have answered these questions in a variety of ways. Some have made arrangements with an independent regulated financial institution to serve as custodian with full backing. Others attempt to maintain a stable price by purchase or sale of the coin with less than full backing reserves.

Historically, when governments and banking regulators were confronted with these sorts of questions, they did not leave the decisions up to the banks. Instead, they put into the banking charters regulatory mandates: minimum reserve holdings, standards for other assets in the portfolio. Economic theory justifies this intervention in part because of the public good nature of payments systems. Individuals will be willing to hold the stable coin only if they are convinced of its usability and safety. Thus, it is in the interest of the payment system provider to maintain the reputation of the system by holding a safe portfolio of assets and plenty of reserves, in order to keep its current holders confident. However, the benefits that the payment system provides to an economy are even greater than those that can be measured by the valuations of current holders of its coins. A payment system provides benefits not only to those currently using it but to those individuals who may become recipients of payments. These individuals engage in economic activity in anticipation of selling their goods and services for future payments, and so also rely on the stability of the payment system. Their interest in stability is not included in the calculus of the system provider, an omission that leads to an under provision of system safety.

An unbacked cryptocurrency does not face the same problem. Like a fiat currency, it gives no guarantee of redemption in any medium other than itself. Thus, it has no need to hold any reserves to back its guarantee. Of course, since it provides no promise it encounters the bigger hurdle of generating a large enough network effect to get customers to be willing to hold the currency or accept it in exchange.

A possibility that has created the most interest and concern recently among regulators and central banks is "Libra," a stable coin proposed by the social-media network Facebook. There are several unusual aspects to the proposal, including the fact that one focus of the arrangement is to make cross border payment and remittance easier and cheaper, and that the new system will be denominated in a basket of currencies and backed by a portfolio of liquid assets in those currencies. It appears that one intent in the proposal is for the currency itself to serve as a common medium among applications that can be run by other entities responsible for satisfying payments and safety regulatory requirements, with Libra's protocols ensuring the inter- operability of these arrangements. In this respect, Libra mirrors, at a higher level, a variety of proposals now being considered by central banks for implementing CBDCs. What

each central bank is trying to do for their currency, Libra is attempting to do (simultaneously) for several central banks across currencies. Their recent white paper (April, 2020), focuses on offering single-currency stablecoins that will require maintaining sufficient reserves across multiple jurisdiction in the form of short-term government securities (80 percent) that cannot be pledged—i.e., no reuse; and the rest in cash-equivalents (20 percent).

These proposals, for the most part, are still in preliminary stages, and the details and motivations vary greatly. Some are explicitly intended as a substitute for cash; others as a competition for or a complement to private payments schemes. However, some of the proposals for CBDC envisage it not primarily as an electronic object directly held by the end user but as a technology around which private entities (traditional or fintech) can build payments applications that become interoperable through the use of a common medium of exchange denominated in existing units of account.

Furthermore, some of the proposals for CBDC become indistinguishable from proposals by which certain authorised payments providers are granted central bank accounts (in which, central bank reserves are the electronic medium) in return for meeting standards for safety and interoperability (see, for example, the proposal of Garratt, and others, 2015.) In fact, while some of the private vendors describe themselves as holding fiat (namely accounts with central banks) as backers of their currencies, the holdings could as well be holdings of CBDC issued by those banks that choose to adopt the arrangement. One incentive for central banks to develop CBDCs is, in fact, the possibility that new payments methods might find tokens a more convenient form of reserve for their own payments arrangements than central bank deposits, and more liquid than existing bonds.

CBDC for everyone (retail and wholesale) will structurally disintermediate the banking system. Will central banks then supply deposits to banks in lieu of collateral? In this case, market plumbing will be impacted adversely as good securities are drained to the central bank balance sheet (Bindseil, 2020)

III. PAYMENT LATENCY

Payment systems were designed to settle payments on a delayed net settlement basis rather than a RTGS basis. Historically, this made sense. Computer processing power and data storage were too expensive to consider settling payments on a gross basis until little more than a decade ago. Legacy payment systems were designed to live within these constraints by aggregating and then netting payments within correspondent banks, which in turn settled on a net basis with central banks. By design, such systems minimised the total quantity of payments settled—and, historically, each bank in the settlement chain processed transactions in batches, usually overnight. Because each bank processed in sequence, it normally took days for businesses to settle a payment. There simply was no alternative that provided businesses a faster, more efficient way to settle. All the netting that happened within the banking system (typically global corporates would net with their preferred single “house bank”) meant that central bank balance sheets could remain a small fraction of the size of system-wide total money and credit outstanding.

In what follows, we illustrate the costs involved. Two important considerations underlie our illustration: the difference between cost of capital for financial and nonfinancial firms, and the risks generated in a system by deferred settlement. Before examining the rise of securities markets in credit creation and their impact on payment systems, a critical question must be asked: who funds the cost of such delays in payment settlement? When a payment doesn't settle instantly, someone carries the risk of the unsettled payment—which includes both time value (interest rate risk) and the risk of default (counterparty risk).

Access restrictions to payments platforms adds some inefficiencies and costs. In the status quo, financial system forces non-financial businesses to shoulder this expense; and here is the wedge in costs: nonfinancial businesses usually have a higher weighted average cost of capital than financial businesses do. Consequently, forcing nonfinancial businesses to shoulder the cost of payment latency is an economic inefficiency—a deadweight loss on society.

If two parties are settling a payment, and the cost of technology decreases (i.e., payment system costs are low), so that parties could settle the payment peer-to-peer instantaneously then why do interest rate and counterparty risks exist in payments? These two risks are not inherent to payments—they are introduced where they would not otherwise exist due to the delayed net settlement structure of the legacy payments system.

In other words, counterparty and interest rate risks are exogenous factors in payments. They exist only due to the design of the status quo financial system, which is hostage to legacy constraints delaying settlement that need no longer exist today—but which powerful incumbents are not very interested in changing, as they capture rent-seeking profits in the meantime.

To illustrate, let's consider the example of a global company that manufactures technology components, that has a global supply chain, and that uses roughly 1,000 different bank accounts located around the world. Let's assume the company has no debt in its capital structure (so that the company is 100 percent equity-financed), and that its weighted average cost of capital is 15 percent. Let's also assume that its cash-management bank has a weighted average cost of capital of 3 percent. In a pareto-optimal world, the cost of payment latency related to this company's payments would be borne by its bank, whose weighted average cost of capital is 12 percent lower than that of the company.

However, status quo payment systems incentivize the opposite. Specifically, the company's bank can only assume a finite amount of credit exposure to the company, so the bank allocates this credit risk budget to the highest-margin products—such as bridge financing for mergers and acquisitions, leveraged loans, accelerated stock buyback programmes, deal-contingent derivatives and other high-margin products. The last thing its bank wants to do is finance the company's payment latency, which is a very low-margin business. Consequently, the bank requires the company to finance its own payment latency by trapping cash in its myriad bank accounts around the world in so-called "comfort deposits" (while the bank captures profits on this float).

This practice is a deadweight loss on society because this company's payment delays are financed by the company's own trapped capital, which has a 15 percent cost, instead of by the bank, which has a 3 percent cost of capital. The math outlined—the company financing its own payment latency with expensive capital provides a powerful incentive for the company's treasurer to seek more efficient payment solutions that enable the company to reduce the amount of capital it must trap in its own bank accounts (Box 1). Companies with the highest cost of capital have the greatest incentive to use RTGS systems, which can minimise their trapped cash and speed up their balance sheet velocity relative to the status quo (Long, 2016); this will also reduce intraday liquidity risks, especially for internationally banks.

Box 1. Counterparty Risks and Accurate Ledgers

No group of payment-system users experiences these problems more acutely than corporate treasurers—especially those that move money across borders. Corporate treasurers also face another calculation that is not widely discussed: they must manage cash balances that far exceed the limits of deposit insurance, such as FDIC insurance in the United States (and similar insurance limits in other countries).

Consequently, corporate treasurers must do something that few retail depositors have even thought about doing since the 1930s: good old- fashioned counterparty credit risk analysis on their deposit banks. Most corporate treasurers are highly sophisticated on this very topic—even though this topic is barely discussed in the mainstream financial press. For example, owing to concerns about the creditworthiness of European banks, by the early 2010s some of the largest and most sophisticated U.S. companies had already transferred their European cash deposits to U.S. money market funds and swapped back them to euros via the FX swaps market.

The connection between the repo market and corporate payments isn't obvious, and very little has been written about it. However, the two are highly intertwined. The primary job of the financial sector, after all, is to intermediate transactions between nonfinancial businesses, and, indeed, national statistics (such as the Federal Reserve's Z.1 data) confirm that the financial sector's aggregate balance sheet is not bigger than that of the nonfinancial sector. The problem is that a significant quantity of U.S. dollar liabilities have accumulated offshore (outside of the U.S. banking system)—and it's impossible to measure the size of these US dollar liabilities accurately.

One possible way to gauge it is to measure the collateral backing these U.S. dollar exposures in the repo market, which is where this collateral changes hands—yet, owing to rehypothecation and other collateral re-use practices, the true magnitude of the offshore U.S. dollar-based credit exposures cannot be measured accurately in this manner either; accurate ledgers via DLT will bring transparency. Periodically, when liquidity dries up in the repo and foreign exchange swap markets, the shortage of U.S. dollar collateral can cause the U.S. dollar to spike—which can trigger losses for businesses, financial institutions and even countries that have short positions in the U.S. dollar. Such instances—beginning with the financial crisis in 2008 plus subsequent instances since then—lead corporate treasurers to focus on the counterparty risk of their banks even more closely.

A. Corporate Treasurers and Future of Payment Systems

Corporate treasurers have strong economic incentives to use RTGS for payments, especially if their company has a high weighted average cost of capital. As true alternatives gain steam it makes no sense for corporate treasurers to keep using status quo systems, which require them to keep capital trapped in bank accounts—often to fund their own payments between their own subsidiaries around the world! One mid-capitalisation technology company alone calculated that the benefit of speeding up payment settle—mint to same-day was US$200 million. In other words, the opportunity to strip out that much lazy capital from its capital structure is a powerful incentive to switch payment systems.

Owing to these strong economic incentives, corporate treasurers will likely be among the first to jump to RTGS as they gain momentum. Multiple Fortune 500 companies have quietly been using Bitcoin in small amounts since 2014, predominantly for transactions in countries without well-developed banking systems. Corporate treasurers are up to speed on all developments in the faster payments area and are quickly able to pivot to solutions that make sense for them.

The switch to faster payments may take many forms—CBDC, to a bank-sponsored digital currency (such as Fnality or JPMCoin), to a private stablecoin (such as Libra or Tether) to a decentralised cryptocurrency (such as Bitcoin). As corporate payments migrate away from heavily netted systems towards gross systems, banks will need to offer more efficient cash management services as non-banks (e.g., mobile network operators) will also play a role (Box 2). The economic incentives for corporate treasurers to switch from legacy payment systems to new, RTGS, are powerful. The big question is: which one, and how fast?

IV. Role of Collateral and Some Policy Implications

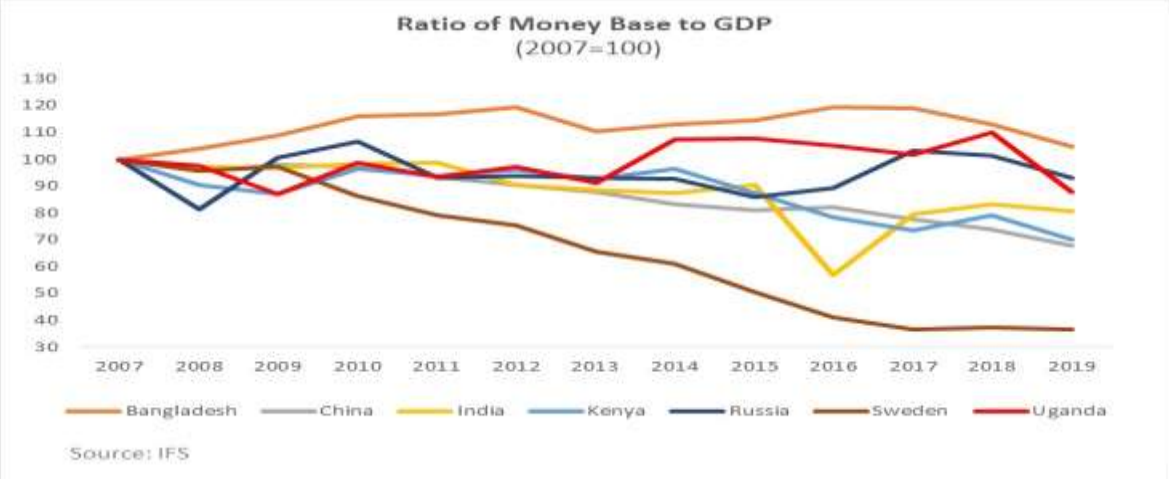
In the near future, privacy provision and reduced payment latency costs will be the two key arguments that will incentive the issuance and use of digital tokens by the private and public sector. It remains to be seen which of the several avenues—CBDC, private digital currency or stablecoin, decentralised crypto—will dominate. Silo-ing more collateral will matter especially amidst (and post) COVID, both central bank balance sheet and bank balance sheets are inundated with reserves and deposits, respectively, a by-product of the asset purchase programs in advanced countries (United States., Eurozone, etc). Underlying economics would favour issuing such tokens in lieu of the large central bank reserves and sizable bank deposits. Such digital tokens will be usable by all economic agents in all of the "pipes" that underline market plumbing, thus akin to collateral reuse. This would improve market plumbing as tokens will be technologically more efficient and reusable like collateral (Singh, 2011). However, tokens by private vendors *without bank charters* would silo more collateral as they do not have access to bank deposits or central bank reserves.[2]

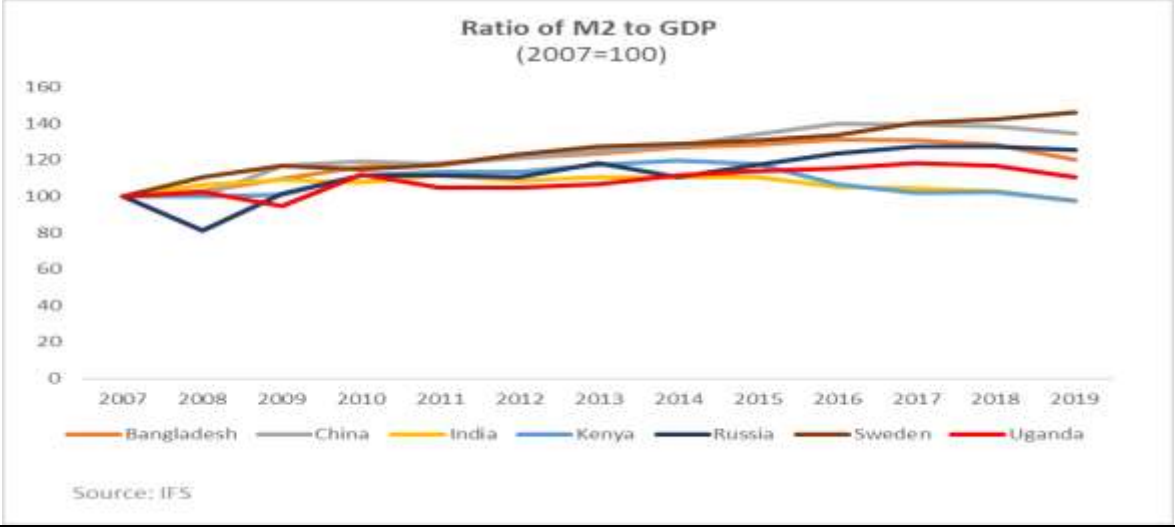
[2] For example, Libra's recent white paper (April 2020) suggests that their coins will be backed (about 80 percent) by very short-term government bonds (i.e., good collateral).

Box 2. Changes in Money Aggregates

The new payments systems may represent a leakage in the transmission channels for monetary policy. Demand for cash depends on the alternatives available to cash. For instance, in economies where individuals are rapidly moving away from the cash economy into banking services, we expect to see the demand for cash falling relative to the demand for bank accounts, and so M0 will become a smaller portion of the money supply. In economies where nonbank alternatives to cash are increasing, we also expect a decrease in the ratio of cash outstanding to GDP, while the effect on broader monetary aggregates will depend on the degree to which reserves are held against the new money substitutes. For instance, in jurisdictions where regulations require holding reserves one for one against e-moneys, movement from cash to e-money will have no effect on broader aggregates, while movement from bank deposits to e-money will reduce broader aggregates.

The reduction in the ratio of M0 to GDP in a few countries (figure below), where the fall in demand for cash is (likely) related to moving away from the cash economy to nonbank alternatives to cash. These countries are very heterogeneous, including developed economies such as Sweden, major emerging economies such as China, India and Russia, and developing economies as Bangladesh, Kenya, and Uganda. However, the behaviour of broader money aggregates has not (yet) changed significantly, which implies that there are no big differences in the regulation and reserve requirements between different money substitutes. The "float" in the monetary system (e.g., mobile money) may become more important to estimate than the gross and net concepts that we have been familiar with.





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