



Fintech and cross-border payments

Dong He analyses how financial regulation and central banking will need to respond to the acceleration of progress in fintech

The IMF has been carefully studying the trends in fintech, and my colleagues and I have gathered some initial thoughts about the way that the financial realm is likely to change. We've also been weighing how financial regulation and central banking will need to respond.

Those of you who would like to explore our reasoning in deeper detail may enjoy reading the two Staff Discussion Notes that we published in the last couple of years—entitled, *Virtual Currencies and Beyond: Initial Considerations* and *Fintech and Financial Services: Initial Considerations*.

However, to gauge the IMF's most recent analysis, a speech last month, at the Bank of England, by the IMF's Managing Director—Christine Lagarde—analyzed potential challenges posed by fintech innovations to central banking. With her uplifting tone, the Managing Director argued that we have the capacity to shape a technological and economic future that works for all. We have a responsibility to make it work. And it's up to us to adopt the right policies.

In this piece—focusing on implications of fintech for cross-border payments—I'll explore three broad areas¹:

First, a sketch of the economic framework on how fintech applications will affect financial services and the market structure.

Second, the current landscape of cross-border payments, and the possible evolution of cross-border payment systems; and

Third, the role of central banks, themselves, and the possible reasons for them to issue their own digital currencies.

The organization of financial services—a general framework

At the outset, let's consider an overall economic framework, which will help us assess the impact that fintech might have on the financial sector, and help us envision how regulation should respond.

Technology can affect the attributes—for instance, speed, security, and transparency—of new services, as well as the organization of service providers—termed market structure. Technological progress can promote the development and adoption of new services especially when targeted at unmet user needs—what we might call the 'gap'

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or 'shortcomings' of services. The bigger the shortcoming, the greater the incentive for firms to improve services as permitted by technological advances, and the faster users' adoption of such services.

Technology can also affect the market structure of service providers. Will new technologies merely increase the profits and the efficiency of established players, or will they have deeper repercussions? Specifically, will they (i) reduce the need for financial intermediaries; (ii) push intermediaries to change their internal structures (possibly leading to partnerships and acquisitions); or (iii) induce the entry of new intermediaries while displacing older ones?

Technology may affect the factors shaping intermediaries. Technology can alter the market imperfections that are pervasive across the financial system, which underpin the need for trusted intermediaries. It can reduce asymmetric information (limited knowledge of one's counterparties to a transaction), facilitate the matching of parties to a transaction, and reduce transaction costs. Technology can also affect the incentives for intermediaries to be horizontally or vertically integrated (offer multiple services to end-users, as does a universal bank, or acquire upstream suppliers). Finally, technology can alter barriers to entry for new intermediaries to compete against incumbents.

The current and future landscape of cross-border payments

Now let's apply this framework to cross-border payments. This is an area especially ripe for change, and could benefit from new technologies. There are significant shortcomings in today's system—stemming in part from technological limits, and in part from a highly concentrated market structure.

It may seem surprising, but cross-border payments are very different from domestic payments. The future could be different—as a simple analogy will suggest. Before the internet, sending so-called 'snail mail' domestically was fundamentally different from sending mail internationally. Pricing was significantly different; the infrastructure was

different; and the handling of cross-border mail required international agreements on payment sharing, packaging, tracking, handling and other processes.

In the age of the internet, however, there is no distinction between a message going to a domestic or foreign recipient: Both of them require, simply, a single click. A package is just a package—and we may soon recognize that a payment is just a payment, wherever it's going.

When making cross-border payments, various types of users—whether they're households, or small enterprises, or large corporations—all put special emphasis on low cost, security, convenience, predictability, and transparency—the assurance that intermediaries will preserve the confidentiality of their information.

Shortcomings of cross-border payments

The shortcomings of cross-border payment services are substantial. Cross-border transfers are costly and cumbersome. Moreover, services are opaque; the price paid for cross-border payments is not transparent, nor known at the time of initiating the transaction in most cases. Finally, sending money across borders is slow. Payments can be routed through many banks before they reach their destination, causing delays and incurring fees. These shortcomings arise from technology, regulation, and market structure.

Market structure

Existing intermediaries benefit from high barriers to entry; each segment of the payments chain remains highly concentrated. In many cases, barriers stem from high fixed and sunk costs required to interface with users, comply with regulation, build trust in services, and operate large back-offices in the case of correspondent banks. In addition, size matters for these institutions to manage liquidity and counterparty risk. Finally, network externalities are

prevalent in messaging—and also in settlement, where netting bilateral positions lowers costs, and access to multiple counterparties facilitates transactions.

Against this background, how could fintech innovations reshape the cross-border payments landscape? To what extent might new technologies reduce service shortcomings, and alter market structure by favoring market platforms over intermediaries, reshaping business plans and firm boundaries, or encouraging entry? And how should regulation respond? While one can only speculate, to some degree, on potential outcomes, much will depend on the scenario for technology adoption.

Three scenarios could be considered, each centered on DLT-based applications. In increasing order of potential disruption, applications might target the areas of: (i) back-end processes; (ii) compliance; and (iii) means of payment.

Back-end processes

DLT could be applied to various processes in cross-border payments. For example, correspondent banks could participate in a shared permissioned DLT platform to automate the tracking of payments, and to optimize liquidity and risk management.

Gains would be most evident in efficiency, with little impact on market structure. In theory, lower fixed back-office costs would diminish economies of scale, spurring new entry—possibly by new types of service providers. However, many of the other barriers to entry to correspondent banking would remain.

End-users may still benefit. Payments settled through correspondent banks would become more transparent and traceable. However, the impact on speed and costs for the end-user is unclear. Correspondent banks may remain oligopolistic and thus unlikely to pass on cost savings.

Compliance

DLT, when combined with other technologies, has the potential to significantly lower the cost of compliance. In particular, know-your-customer utilities and digital identity can facilitate information-sharing and help reduce the cost of compliance, including with respect to AML/CFT regulation and sanctions-related controls. However, the use of new technologies in the field of compliance may be limited by broader issues, including the extent to which regulation would allow financial institutions to outsource customer due diligence.

Market structure would not be left unscathed. Digital identities could allow end-users to switch more easily between service providers, thereby reducing the economies of scope extracted by intermediaries from proprietary information on customer profiles. Such a development would depend on the willingness of existing service providers to share such information, unless they are required to do so by regulation.

New compliance technologies could benefit end-users, but privacy and security issues may arise. Services would probably become cheaper and more inclusive. However, DLT-based applications for compliance could raise concerns over privacy and the security of personal information maintained on the ledger. In addition, the security of digital identities will be an important issue to address (for instance, if a digital identity were stolen and misused by a third party).

Means of payment

DLT can be used to underpin an entirely new means of payment. This is already happening with the emergence of virtual currencies. These means of payment are tokens that are exchanged electronically between market participants, much like cash, over a permissionless (open) or permissioned (fully private or consortium) DLT-based network. The use of these systems effectively shifts payments from accounts-based systems to token-based systems.

Two applications of DLT as a means of payment are relevant for cross-border payments; the first involves a privately run hub-and-spoke payments network. Users exchange fiat money into a virtual currency (DLT-based tokens) held in digital wallets through ATM machines, point of sales terminals, online interfaces, or other means (the spokes). These tokens are then transferred, possibly across borders, over the virtual currency's secure network (the hub) to the payee's digital wallet. Finally, tokens are exchanged into foreign fiat money, as desired, through the same means as above (spokes again).

The implications for market structure are significant; pressure would grow to shorten the traditional payments chain. Messaging and settlement either in central bank money or through correspondent banks would no longer be needed. In the capturing and distributing segments, instead, virtual currency exchanges and wallet providers would compete for customers, potentially taking significant business away from other players.

From the end-user's perspective, the attributes of payment services offered by hub-and-spoke networks look attractive—despite three important caveats. Cross-border payments could become significantly faster, more traceable, and easier to use. Payments could also become cheaper and more secure.

But here are the three caveats:

The first caveat is: the potentially erratic valuation of virtual currencies introduces risks and could limit the adoption of hub-and-spoke networks, at least for large-value payments. In their current form, virtual currencies are not likely to be adequate stores of value given the volatility in their exchange rates to fiat money.

The second caveat is: a lack of trust in hub-and-spoke networks could erode their value. Just as trust is needed in the authenticity of a paper bill in traditional token-based payment systems, trust in the hub-and-spoke

solution is also essential. That is truly vital, for three reasons. One: counterparties need to have legal certainty regarding the transfer of ownership of the virtual currency. Two: counterparties need to have trust in the stability and security of the technology underlying the virtual currency. This also implies trust in the issuance rule (or backing) for the virtual currency. Three: users need to trust the security of the virtual currency exchanges and wallet providers needed to enter and manage hub-and-spoke transactions. Users may be concerned with the security of their data, and the ability of others to access their wallets. Regulators may then need to consider regulatory approaches to virtual currency exchanges and wallet providers that would sufficiently protect consumers, and address AML/CFT concerns.

The third caveat is: the lack of interoperability among networks could keep prices of hub-and-spoke payments high. If networks are not interoperable, network externalities could be strong, and providers could take advantage of market power to charge high fees. Regulation aimed at addressing anti-competitive concerns could help alleviate this outcome.

Central bank digital currencies

Let me now turn to a second possible avenue for DLT application to be used as a means of payment: Central banks could offer their own digital currencies.

A Central Bank Digital Currency—let's call it, in shorthand, a CBDC—would not be a parallel currency. It would merely be a digital form of central bank money that can be exchanged in a decentralized manner. In other words, it can be transferred or exchanged peer-to-peer, directly from payer to payee without the need for an intermediary.

Such a CBDC would be exchanged at par with the central bank's other liabilities (its cash and reserves)—either through banks or directly at the central bank.

Why issue a Central Bank Digital Currency?

The balance of benefits and costs surely needs further study—but central banks might consider introducing CBDCs for various reasons. Efficiency considerations provide a first reason. Efficiency arguments for CBDCs are based on countering the monopoly power that strong network externalities might confer on one or a few private operators in the payments system or private virtual currencies, or on the inability to ensure the full stability and safety of privately coded and maintained currencies. In addition, a CBDC could overcome the coordination failure involved in any inability to agree on a single new technological standard for electronic payments. In terms of stability, a DLT-based CBDC could also be more secure and resilient than current settlement systems which are exposed to single point of failure risk.

From a retail point of view, gradually replacing notes and coins with a CBDC entails savings on the costs of maintaining and replacing notes and coins for the state. It may also significantly reduce transaction costs for individuals and small enterprises that have little or costly access to banking services in some countries or regions; and it may facilitate financial inclusion. In addition: By facilitating small-value payments, it could boost the adoption and efficiency of the new, decentralized, service economy.

Monetary-policy considerations provide a second reason. The introduction and potential proliferation of private virtual currencies might threaten to erode the demand for central-bank money and the transmission mechanism of monetary policy. A CBDC may forestall such private virtual currencies or relegate them to a secondary role in the payments system.

Another monetary policy consideration is that replacing cash, except possibly for costly-to-store small denomination notes, with a CBDC could allow the central bank to lower interest rates well into negative territory when nec-

essary to fulfill its mandate. However, this potential benefit has to be balanced by the important consideration that central banks will need to respect social preferences for the form of money.

What kind of CBDC?

In making the decision about whether to issue a CBDC, central banks should also consider: Precisely what type of digital currency should they issue?

In terms of basic design, the CBDC would presumably respect the following requirements: it would be issued in the same unit of account as fiat money; it would be a liability of the central bank and would be exchanged at par with its other non-equity liabilities—mainly cash and commercial bank reserves.

Other characteristics of CBDCs, however, would differentiate them from commercial-bank reserves in one or several ways. Importantly, whether interest is paid on a CBDC or not has important and differing implications for the transmission and effectiveness of monetary policy, as well as for financial stability. A non-interest-bearing CBDC would be a better substitute for cash than for bank deposits, an interest-bearing one for bank deposits. The latter may affect the transmission mechanism and financial stability more than the former.

The central bank would have to make decisions relative to distribution. The basic questions are how and to whom it would distribute its digital currency. The last issue concerns the choice of technology used to support the CBDC. The form and broad design of the CBDC eco-system will eventually reflect the development and maturing of fintech technologies.

These technological and organizational choices raise several questions, such as: can the chosen technology be made secure, and can speed be maintained? What does it imply as to who bears the costs of operating, maintaining,

and developing the digital currency? Should it be the central bank, or could private sector participation be possible, so that the central bank can remain a catalyst as opposed to a full-scale operator?

These are among the many questions that the introduction of CBDCs raise about the nature and regulation of the financial system, the conduct of monetary policy, and the role of the central and commercial banks in the economy. Many of these questions are political and complex. This would seem to warrant a gradual approach to introducing CBDCs, if at all, building on experience, and on evolving and maturing financial technologies.

Conclusion

As fintech innovations gather pace, boundaries are blurring between intermediaries, markets, and new service providers. Barriers to entry are changing, being lowered in some cases but increased in others, especially if the emergence of large closed networks reduces opportunities for competition; but trust remains essential. And technology has the promise to improve cross-border payments, including by offering better and cheaper services, and lowering the cost of compliance with AML/CFT regulation.

Amid a landscape of change, one thing is certain. As our Managing Director, Madame Lagarde, said in her recent Bank of England speech: *“To make things smoother – at least a bit – we need dialogue... Between policymakers, investors and financial-services firms – and between countries.”*

We at the IMF are ready to work constructively on the task of reshaping the cross-border payments landscape – aiming to ensure that down-side risks are minimized, and that the economy can capture the full value of fintech’s promise. ■

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This article is based on a [speech](#) given at the IMF Ripple – Central Bank Summit, Carnegie Hall, New York, November 1, 2017

Endnotes

1. This speech is based on [“Fintech and Financial Services: Initial Considerations”](#), IMF Staff Discuss Notes No.17/05.