

Chicago Fed Letter

Fostering payments innovations

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The Federal Reserve Bank of Chicago hosted its 14th annual Payments Symposium on September 25–26, 2014. Industry leaders met to discuss ways to make the U.S. payment system faster, more convenient, and more secure as a whole. Participants evaluated emerging domestic payments trends and examined other countries' recent experiences with payment system upgrades to help develop a U.S. framework for future innovations.

Some materials presented at the symposium are available at <http://chicagopaymentssymposium.org/2014-program/>.

The payments landscape has seen rapid transformation in recent years, as innovations such as mobile payments and virtual currency have been developed to meet consumer demand for more-convenient payment options. However, most consumers and businesses, at least in the U.S., still rely on legacy payment methods that do not fully meet their needs, partly because they are hesitant to embrace new payment methods that have yet to be broadly adopted. Those bringing new payment methods to the marketplace face concerns from consumers and merchants about these products' security, as well as interoperability with traditional payment products and infrastructure. Such concerns prevent new payment methods from gaining broad customer adoption. Payments regulators also struggle to adjust laws and standards to allow for technological innovation while maintaining protections for consumers.

Over the past few years, the Federal Reserve has reached out to leaders within the U.S. payments industry to develop a roadmap for payment system improvement. The idea for developing this roadmap was introduced by Sandra Pianalto—former chair of the Fed's Financial Services Policy Committee—at the 2012 Payments Symposium.¹ Since then, the Federal Reserve has extensively analyzed potential payment system

improvements—including the capability to process payments immediately with finality²—in consultation with industry experts. The 2014 Payments Symposium continued this dialogue, as over 150 leaders representing a broad cross section of the payments industry met to discuss payment improvements that could help consumers and businesses.

Steven Johnson kicked off the symposium with a keynote speech on innovation. Johnson traced the evolution of many different technological innovations, from early sound recording devices to the World Wide Web. Johnson noted that despite the rapid pace of technological innovation today, lasting change is based on developing new ideas over a long time horizon while incorporating diverse perspectives. Blind spots will often be missed when innovating too quickly without a spirit of inclusivity, Johnson argued. Moreover, he emphasized that the best innovations are forward-looking, suggesting that any new payment platform should be flexible enough to allow for future changes. Johnson's comments set the stage for the high level of discussion held throughout the symposium.

Fast and secure payments

In the U.S., it can presently take a few days for a payment to clear; by contrast, in many other countries that have upgraded

their payment systems, a payment can be processed immediately with finality. The first panel focused on developing faster payments in the U.S., which has been a key part of the Fed's recent efforts to improve the payment system with public input.³ Philip Bruno, head of payments in North America at McKinsey & Company, explained the Federal Reserve's recent business case analysis for faster payments in the U.S.,⁴ which his firm assisted with. He discussed the potential costs and benefits of a faster system for many types

will be upfront costs to the financial industry for developing faster payment capability, rising end-user demand for immediate payments could in the long run make for a compelling business case to develop this capability.

Developing a faster payment system would involve large coordination and implementation costs because of the thousands of banks and payment service providers in the U.S. economy. Yet, such a development is not without precedent, as Gene Neyer, senior vice president of Fundtech,

are news reports of data breaches and cyberattacks, which threaten the public's trust in the payment system. He noted that shifting global power structures and the rise of criminal or terrorist nonstate actors will likely make it increasingly challenging to fight off cyberthreats to the U.S. payment system.

The Federal Reserve recently conducted a study evaluating payments security.⁷ A panel at the 2014 symposium discussed this study's findings. Barbara Pacheco, senior vice president of the Federal Reserve Bank of Kansas City, summarized the study's results. Based on interviews with 40 stakeholders in the payments industry, Fed staff conducting the study reported that two key security priorities are improving authentication and enhancing the protection of sensitive data and messages throughout the payment process.

The payments security panel included representatives from Walmart and MasterCard who discussed the challenges for retailers, card issuers, and card networks in providing *both* strong security for electronic payments and a convenient customer experience. New encryption and tokenization⁸ initiatives and the roll-out of EMV⁹ cards have the potential to decrease fraud without adversely affecting the customer experience. Still, even with these new security measures, the panelists agreed that some amount of fraud has to be assumed as a cost of doing business. In closing, Pacheco cautioned that a private party's security breakdown (e.g., a data breach) may have much broader repercussions (negatively affecting confidence in the entire payment system) than an individual firm's cost-benefit analysis would account for.¹⁰

Emerging payments: Interoperability and regulation

Four other panels addressed specific areas of improvement within the emerging payments landscape. One main theme was the need for greater interoperability, which panelists defined as the ability for a business or consumer to seamlessly send a payment to another recipient regardless of whether or not the sender and receiver have accounts with the same financial institution.

A summary of the Fed's recent assessment of faster payment options is available at https://fedpaymentsimprovement.org/wp-content/uploads/faster_payments_assessment.pdf.

of payments made by consumers and businesses.⁵ Bruno then identified the five use cases with the highest potential to benefit from faster payments: person-to-person payments (e.g., rent repayments to roommates); one type of business-to-business payment (e.g., just-in-time supplier payments); one type of person-to-business payment (e.g., last-minute bill payments); and two types of business-to-person payments (e.g., insurance claims/legal settlements and wage payments to temporary workers).

Bruno proceeded to walk the audience through four potential alternative paths for improving the speed of the U.S. payment system as outlined in the Fed's analysis: upgrading certain debit card clearing infrastructure to leverage existing real-time functionality; permitting direct clearing between financial institutions over public IP (Internet protocol) networks; building a new single-message clearing infrastructure that leverages legacy systems for settlement; or building a new platform for small-dollar payments. Based on McKinsey's analysis for the Fed, Bruno said the overall business case to make faster payment capability a reality for the five primary use cases was, on net, neutral to negative (in terms of profit contribution) through 2025. However, he pointed out that the analysis was intentionally conservative in its assumptions and methodology. Bruno's fellow panelists agreed that while there

pointed out: Integrating the electronic payment systems of various European nations to form the Single Euro Payments Area (SEPA) was a long and costly process, but ultimately the cross-border integration successfully connected thousands of banks.⁶ Neyer noted that SEPA integration was possible through the strong governance of the European Payments Council and the European Commission (which mandated individual countries and financial institutions to migrate to the shared SEPA framework). Symposium participants generally supported the idea of forming a U.S. council for faster payments as a starting point for better coordination among stakeholders.

The panelists also agreed that enabling faster payments must go hand in hand with improving payments security. A system for immediate payments increases the level of risk by making it more difficult to detect and stop fraudulent transactions before the transactions clear. As new and faster payment methods are developed, they will require security enhancements.

A keynote speech by General Michael Hayden, former director of the Central Intelligence Agency (CIA) and the National Security Agency (NSA), also highlighted the need to continually improve security standards to keep up with the ever-changing cybersecurity landscape. Almost daily, said Hayden, there

A panel focusing on achieving trusted interoperability discussed two key components: directories and tokenization. Directories facilitate easier payments by providing a common mapping of bank accounts for transaction routing. Tokenization makes payments safer by replacing actual account numbers with placeholder tokens, making it much harder to steal valuable data. Despite concerns about privacy and security, the interoperability of multiple directories may be possible, which would allow payments to move more easily between consumers and businesses. Tokenization efforts are already under way across various parts of the U.S. payment system, and panelists noted that tokenization standards might provide the security boost needed to achieve greater interoperability.

One payment type that could especially benefit from greater interoperability and efficiency is business-to-business payments. As shown in the *2013 Federal Reserve Payments Study*,¹¹ most payments between consumers and businesses have shifted away from checks and toward electronic methods in recent years. However, paper checks are still commonly used for payments between businesses because it is difficult to send invoice information electronically. One panel focused on the development of standards for electronic business-to-business payments. Panelists discussed an industry stakeholder group's initiative to explore adoption of the ISO 20022¹² international messaging standard for electronic payments in the U.S. Even without a clear business case, the group recommended transitioning to ISO 20022 because a failure to adopt international standards could have negative long-run impacts on businesses, banks, and even the U.S. dollar.

In addition to adopting standard messaging formats, businesses could benefit from directories that simplify the routing of electronic payments. The Remittance Coalition,¹³ an industry group based out of the Federal Reserve Bank of Minneapolis, has recently published a paper outlining the case for directory interoperability to facilitate business-to-business electronic payments.¹⁴ Relatedly, Claudia Swendseid, senior vice

president of the Federal Reserve Bank of Minneapolis, described the progress the Remittance Coalition has made in simplifying business-to-business electronic payment codes and remittance standards and in educating small businesses so that they can transition to electronic payments.

A panel of speakers representing emerging payments firms highlighted their views on some potential limitations of the current regulatory system in keeping up with changing technology; for instance, even if new payments processors do not face the same regulatory requirements as full-fledged banks, it is still difficult for them to meet licensing requirements across all 50 states. Some speakers argued that these and related regulatory roadblocks lead to slower, more costly, and piecemeal innovation. Panelists expressed hopes for emerging technologies that have the potential to securely track and verify payments in a decentralized environment (e.g., the bitcoin protocol¹⁵), reducing the need for some regulation.

Lawyers and policy specialists on a separate panel discussed how to make governance of the U.S. payment system more effective in adapting to innovation. One key to effective governance is to involve a broad range of stakeholders in making decisions; a good example of this is the Emerging Payments Task Force created by the Conference of State Bank Supervisors.¹⁶ This task force brings together state regulators from across the nation to consider the impact of virtual currencies and other recent innovations on the payment system. Panelists also debated whether it is better to use the existing regulatory structure or to try to develop new rules and regulations at the product level to govern new technologies. They concluded that even though product-level regulation is more complex, it is probably more appropriate for emerging technologies like bitcoin that do not neatly fit into the same mold as traditional payment products.

Kirstin Wells, vice president and risk officer of the Federal Reserve Bank of Chicago, also highlighted recent research on broader payment system governance trends, showing that in certain countries effective payment system governance is

associated with a governmental authority—be it a central bank or a government agency—playing a coordinating role. Given that payment system governance in the U.S. is highly decentralized, broad payment system improvements may be more difficult to implement.

International case studies: Australia and Singapore

Australia is currently making the transition to its New Payments Platform (NPP)—which will enable future payments to be processed and settled in real time with finality, even outside of normal banking hours (almost 24/7). NPP will include improved messaging capability based on the ISO 20022 standard, allowing more detailed remittance information to be sent with payments. Using the ISO 20022 messaging standard will also enhance interoperability at the national and international levels. Tony Richards, head of payments at the Reserve Bank of Australia, or RBA (Australia's central bank), and Chris Hamilton, CEO of the Australian Payments Clearing Association (APCA),¹⁷ shared some lessons they learned while working with the payments industry to design and implement NPP.

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The initial impetus to deliver faster payment capability to Australia came from the RBA's Payments System Board, said Richards. However, both the RBA and APCA quickly realized that they would need to instill a sense of ownership among the major payments industry players if NPP was to be successful. Initial buy-in and ongoing participation from the major banks were critical because otherwise not enough payment volumes would be generated to make NPP financially viable.

Richards and Hamilton said four key factors drove the RBA and APCA's successful campaign for payment modernization. Major stakeholders in the payment system 1) recognized there were "gaps" in the current payment system—in particular, the inability to make retail payments in real time, which consumers would demand in the near future; 2) accepted that a positive business case for building a new faster payment system would emerge in the long run; 3) realized that faster electronic payments would bring in new revenue and reduce costs, as cash and check volumes were replaced; and 4) presumed that if the private banks did not change their payment product offerings, nonbank payment providers would step in to meet the growing consumer demand for faster payments.

According to Hamilton, the threat of regulatory action from the RBA helped push the banks forward to build a new system. But ultimately, the banks had to want to change the system for competitive reasons—which is why a firm belief in the underlying consumer demand for faster payments was critical to forging consensus around the new payments infrastructure. In closing, Hamilton noted that the APCA played a critical role in coordinating efforts between the RBA and the banks to design and implement NPP.

The city-state of Singapore successfully launched a new electronic funds transfer service called Fast and Secure Transfers (FAST)¹⁸ in March 2014. FAST allows customers to transfer funds almost immediately, on a 24/7 basis, between accounts of the 14 participating banks in Singapore. Neo Bock Cheng and Ricky Lim, senior commercial bankers with OCBC Bank, gave an update on Singapore's experience with faster payments thus far. Adoption of FAST has been strong, with its market share having reached 20–25% within six months of its launch. Cheng and Lim echoed what Richards and Hamilton said about Australia's experience in moving to faster payments: Strong support from banks was necessary to make the new service

a success. They also stressed the importance of robust testing and operational support, as well as early marketing to the general public, to spur quick and seamless adoption.

Going forward

As the pace of payments innovation accelerates around the globe, the private sector and public sector must work together to establish standards for faster, safer, and more flexible payment systems, as exemplified by recent developments in Australia and Singapore. Many participants agreed that a positive business case for faster payments in the U.S. will emerge in the long run, based on rising consumer demand for immediate payments in an increasingly digital world. There was also agreement among the participants that the shift to faster payments should be coupled with improvements in payments security. Many solutions, such as data tokenization, are already being implemented to address security concerns. However, the U.S. payments industry lacks common standards for interoperability to implement these technologies in a way that will allow for efficient payments. To deliver greater payments speed, security, and interoperability, industry players and regulators must come together to develop a framework for payments innovation.

¹ For more details, see <https://www.chicagofed.org/publications/chicago-fed-letter/2013/february-307a>.

² For details, see, e.g., <https://www.chicagofed.org/publications/chicago-fed-letter/2011/november-292a>.

³ See <https://fedpaymentsimprovement.org/>. And see, in particular, https://fedpaymentsimprovement.org/wp-content/uploads/2013/09/Payment_System_Improvement-Public_Consultation_Paper.pdf.

⁴ Business case analysis predicts (based on available information at the time of forecasting and reasonable assumptions) the likely financial results and other consequences of taking an action, typically for a single firm. On behalf of the Fed, McKinsey calculated a business case for implementing faster payments, taking into account the estimated costs and benefits to end-users of the payment system (consumers and businesses) as well as financial institutions.

⁵ In the analysis, businesses include governmental entities.

⁶ For more on SEPA, see www.europeanpaymentscouncil.eu/index.cfm/about-sepa/sepa-vision-and-goals/ and http://ec.europa.eu/finance/payments/sepa/index_en.htm.

⁷ A summary of the Fed's *Payment Security Landscape Study* is available at https://fedpaymentsimprovement.org/wp-content/uploads/payment_security_landscape.pdf.

⁸ Tokenization replaces sensitive data (e.g., credit card or bank account details) with unique symbols that identify the individual making the payment without compromising the security of that individual's data. See the next section for further discussion.

⁹ EMV (Europay, MasterCard, and Visa) is a global standard for the interoperation of chip-based payment cards with point-of-sale devices and automated teller machines. For more details, see www.emvco.com.

¹⁰ See, e.g., <https://www.chicagofed.org/publications/economic-perspectives/2013/3q-dhameja-jacob-porter> and <https://www.chicagofed.org/publications/economic-perspectives/2012/4q-cheney-et-al>.

¹¹ https://www.frb services.org/files/communications/pdf/research/2013_payments_study_summary.pdf.

¹² ISO 20022 is a standard for financial services messaging using popular computer syntaxes, such as Extensible Markup Language (XML). For further details, see www.iso20022.org.

¹³ <https://www.minneapolisfed.org/about/what-we-do/payments-information/remittance-coalition>.

¹⁴ https://www.minneapolisfed.org/~media/files/about/what%20we%20do/remittance%20coalition/remittance_coalition_b2b_directory_paper_distribution_final.pdf.

¹⁵ For details on how bitcoin works, see <https://www.chicagofed.org/publications/chicago-fed-letter/2013/december-317>.

¹⁶ www.csbs.org/regulatory/ep/Pages/default.aspx.

¹⁷ The APCA is a self-regulatory body; for details, see www.apca.com.au.

¹⁸ For details, see www.abs.org.sg/fast.php.