An Update on the Federal Reserve's Instant Payments Service: FedNow®

Loretta J. Mester
President and Chief Executive Officer
Federal Reserve Bank of Cleveland

Summer Institute 2023
Macro, Money, and Financial Frictions
National Bureau of Economic Research
Cambridge, MA

July 12, 2023

Introduction

I thank the organizers for inviting me to update you on the FedNow® Service, the Federal Reserve's new instant payments service. When the FedNow Service begins to roll out later this month, it will be the first new Fed payments rail in 50 years. Before I continue, I note that the views I present will be my own and not necessarily those of the Federal Reserve System or of my colleagues on the Federal Open Market Committee (FOMC).

Figure 1. The Fed's Role in Payments

The payment system is a crucial part of the infrastructure of the U.S., and a well-functioning and secure payment system is vital for a sound economy. The Federal Reserve System has responsibility for fostering a safe, efficient, and widely accessible payments infrastructure, and the Reserve Banks have provided payments and settlement services alongside the private sector for more than 100 years. The Fed has this responsibility because as the country's central bank, it can uniquely provide interbank settlement without introducing liquidity or credit risks. Settlement refers to the debiting and crediting of accounts to transfer funds for a payment. Settlement is the foundation for most payment systems, allowing the sender's depository institution to settle a payment by moving funds to the receiver's depository institution. The Fed's payment services include check processing, automated clearinghouse (ACH) services, and wire transfers. In addition to settlement, these services include clearing, which refers to the exchange of information about a payment.

The Fed offers its payment services on behalf of the public in competition with and in support of similar services provided by the private sector. Unlike central banks in other countries, the Fed has not been given complete regulatory or supervisory authority over the U.S. payment system. But by offering payment services, the Fed has been able to promote accessibility, safety, efficiency, and innovation in the payment system.

Figure 2. Demand for faster digital payments: Value of noncash payments

One of those innovations has been technology, which has been driving the increased use of electronic payments. Because the current payment system works well, most people have spent little time thinking about the backbone that makes these payments possible and ensures that the payment system is reliable and secure. But with new technologies and new service providers, more people are seeking new ways to execute transactions and they want to execute them much faster.

According to the 2022 Federal Reserve Payments Study, the value of noncash payments has accelerated significantly over time. These payments grew at an annualized rate of 9.5 percent between 2018 and 2021, reaching a value of $128.5 trillion in 2021.[1] In 2021 about 205 billion noncash transactions were made in the U.S., over 600 payments for every American.[2] According to a Fed survey, in 2022 nearly 75 percent of consumers used mobile payment devices to send or receive payments, and usage spanned consumers of all ages.[3] This is a considerable increase from 2013, when only 10 percent of consumers had made a mobile payment. Over half of the consumers surveyed in 2022 are using nonbank mobile apps to make faster payments, and 38 percent are using digital wallets.[4]

Figure 3. Demand for faster digital payments: Share of retail sales made electronically

The share of retail sales made electronically jumped during the pandemic, but this share began increasing much earlier. According to the U.S. Census Bureau, e-commerce sales accounted for about 6 percent of total U.S. retail sales in 2013. That share has now risen to 15 percent.[5] Consumers have become more

---

[1] Noncash payments include debit and credit card transactions, checks, and direct deposit and automatic payment transactions that go through the automated clearinghouse system. See Board of Governors of the Federal Reserve System (2023a).

[2] See Board of Governors of the Federal Reserve System (2023a).

[3] See FedPayments Improvement (2023).

[4] In the survey, faster payments include instant payment services, same-day ACH, push to card, and digital wallet apps. See FedPayments Improvement (2023).

[5] See U.S. Census Bureau (2023). In this report, e-commerce sales are defined as "sales of goods and services where the buyer places an order, or the price and terms of the sale are negotiated over an Internet, mobile device (M-

comfortable making online payments, but they also want up-to-the minute information on their payments and accounts, including information on when their payments have cleared and what their account balance is in real time. Businesses are also demanding quicker access to their funds and the ability to automate their accounting processes.

This demand is being met by private-sector services and providers, including banks and fintech companies, that are offering consumers and businesses more modern and convenient methods for making payments. But while it appears that the payments are moving in real time, in most cases, the actual clearing and settlement of payment instructions on both sides of these transactions take place through the traditional system: transactions are settled in periodic batches, processed one or more days later, and available only during regular banking hours. Of course, this creates some risk because banks might choose to make final funds available to the customer before receiving the covering funds from the payer's bank.

Figure 4. The FedNow® Service

After several years of planning and consulting with the payment industry and other stakeholders, in 2019, the Fed announced it was developing the FedNow® Service.[6] FedNow will provide the infrastructure for instant payments, linking banks and credit unions of all sizes. FedNow will not be offered directly to individuals and businesses, but it will allow the customers of financial institutions offering the service to send and receive payments within seconds around the clock on every day of the year and to get full access to those funds immediately, with instant finality of payment. The service is being designed as a flexible and neutral cloud-based platform, which is unique among central bank instant payment services, and that

---

commerce), extranet, Electronic Data Interchange (EDI) network, electronic mail, or other comparable online system. Payment may or may not be made online."

[6] Mester (2022) discusses the path that led to the decision to move forward with FedNow. The FedNow website and the FedNow blog contain additional information on the new service.

design will make it easier to reach scalability and geographic resiliency. Cloud-based does not mean it is designed using distributed ledger technology. Instead, the FedNow Service settles payments in Federal Reserve Bank master accounts, so it relies on a centralized ledger.

The FedNow Service is expected to yield several economic benefits for individuals and businesses and these benefits were taken into account when deciding to move ahead with the service. FedNow will provide the public with more flexibility to manage their money and to make time-sensitive payments whenever needed. This may be especially beneficial for households and businesses that are less liquid, helping them avoid late fees when making payments. It could help individuals who aren't on a regular payroll, such as gig workers, get faster access to their wages. It could help the federal government disburse support payments faster during emergencies. It is expected to provide the public benefit of increased resiliency by offering an alternative payments rail. FedNow is also expected to increase access to instant payments for more people because the country's more than 10,000 banks and credit unions of all sizes will be able to use their existing electronic connections to the Fed and their existing Fed settlement accounts to process real-time retail payments for consumers and businesses. Because the platform is flexible and neutral, the FedNow instant payments rail is also expected to spur additional innovations from banks, payment processors, and other providers of payment services to meet the specific needs of their customers.

FedNow will operate alongside the private sector's instant payments service, The Clearing House's Real-Time Payments (RTP®) service. This competition is expected to help promote efficiency in instant payments. Consistent with its public-service mission, in addition to FedNow, the Fed is providing direct support for the development of private-sector faster payments. For example, in 2017, the Board of Governors approved final guidelines for evaluating requests for joint accounts at the Reserve Banks.[7]

[7] See Board of Governors of the Federal Reserve System (2017).

These joint accounts facilitate the settlement of payments between and among the banks that participate in the private sector's instant payments service. The Fed has also worked to expand the operating hours of its current ACH and funds systems.

Figure 5. Features included in the FedNow Service at rollout

The FedNow Service is being tested and certified with a diverse group of first adopters that were part of the pre-launch pilot program; the group includes financial institutions, processors, service providers, and the U.S. Treasury.[8]

At rollout, the FedNow Service will include features that focus on clearing and settlement.[9] At its most basic level, the FedNow platform provides interbank settlement that enables funds to be transferred from a payment sender's bank account to a receiver's bank account immediately and at any time. No prefunding is required. The limit per customer credit transaction will be $500,000, but the initial setting of the transaction limit will be $100,000. A participating institution will be able to adjust that default limit down or up, to a maximum of $500,000, depending on its preferences. Participants will be able to decide whether they want to both receive and send payments or whether they want to only receive payments. And they will be able to specify a list of suspicious accounts to and from which they neither want to send or receive payments.

Also included at the rollout will be request-for-payment functionality that will support bill payment; the ability to include information about a payment along with the payment, e.g., invoice information; and certain fraud-mitigation tools.

---

[8] See Board of Governors of the Federal Reserve System (2023b).

[9] See Federal Reserve Financial Services, "FedNow Service," *Product Sheet*.

When the FedNow Service rolls out, the Fed will also offer liquidity management transfers that will allow financial institutions to move funds between their Federal Reserve accounts during hours when the traditional payment and settlement services and the discount window are not open.[10] These transfers will support both FedNow and private-sector real-time settlement.

The Fed intends to build in more features as the FedNow Service develops and matures.

Figure 6. Steps in a FedNow transaction

Financial institutions will be able to connect to the service either directly, via their core processors, or through a technology service provider. Let me walk you through a simple FedNow transaction in which both sending and receiving banks are directly connected to the service.

First, an individual or business uses an end-user interface to initiate a payment with their financial institution. The sender's bank validates the payment according to its own internal processes and requirements.

Second, the sender's bank submits the payment message to the FedNow Service.

Third, the FedNow Service validates the payment message, checking to see that it meets the proper format specifications and complies with applicable controls.

[10] Liquidity management transfers will be available from 7 pm to 7 am Eastern time on weekdays, and 24 hours per day on weekends and holidays. The transaction value limit will be $2.5 million, although financial institutions can set their send limit at a lower level if they prefer. A financial institution's cumulative daily send limit will be $10 million. For more information on liquidity management and account balance reporting, see Federal Reserve Financial Services (2021) and Federal Reserve Financial Services.

Fourth, the FedNow Service sends the payment information to the receiver's financial institution and asks that bank to confirm that it intends to accept the payment message. It can accept, or reject, or accept without posting, which means some of the pre-checks of the transaction are pending or delayed. In this step, the receiver bank will want to verify that it maintains an account for the recipient identified in the contents of the payment message.

Fifth, if the payment is accepted, the receiving bank sends notification to the FedNow Service confirming that it intends to accept the payment message.[11]

Sixth, the FedNow Service settles the payment, debiting and crediting the designated master accounts of the sender and receiver banks, respectively.

All of this is expected to be completed within a few seconds. (The Fed has set an upper limit of 20 seconds to give banks clarity on the maximum time allowed for a payment to either settle or be rejected.)

Finally, to complete the process, the FedNow Service sends an advice to the receiver bank and an acknowledgement to the sender bank, executing the payment order and notifying each that the Federal Reserve Banks have settled the payment. The receiving financial institution makes funds immediately available to the recipient.

Figure 7. Next steps on the agenda

The rollout of the FedNow Service is only the beginning of the journey. Enhancements will be made to the FedNow Service over time to support safety, resiliency, and innovation. There are several items on

[11] Steps 4 and 5 are intended to reduce the number of misdirected payments and resulting exception cases that can occur in high-volume systems.

the agenda after the official rollout. Some of these are near- to medium-term efforts and others longer-term considerations. So let me conclude with a few of these.

Growing the number of financial institutions using the FedNow Service

Since the value of a payment service ultimately depends on the number of users, the Fed will be focused on growing the number of institutions that use the FedNow Service for sending and receiving payments. The U.S. does not have a mandate that financial institutions offer the service, unlike other countries, including Brazil, which mandated that banks offer its Pix instant payments service. In addition, we have a complex financial industry, with a variety of different types and sizes of institutions. For many financial institutions, getting ready to use FedNow will take some investment. Some organizations will need to upgrade older payment infrastructures, accounting procedures, and other back-office processes to accommodate the expanded 24×7 operating hours. But these investments will allow them to offer this new instant payment service to customers, who are increasingly demanding faster payments.

Educating the public and financial institutions: Fraud mitigation and depositor runs

Growing the network will also require increasing public awareness so that it understands not only the benefits of instant payments but also the implications of fast finality of payments. Financial institutions that participate in FedNow, as in other payment services, serve as a primary line of defense in protecting their customers against fraud. The initial release of the FedNow Service will include features to help banks manage fraud risk and mitigate fraud losses. It will include tools that allow participants to reject payments to and from accounts they have designated as suspicious and to put limits on the amount of the transaction. In addition, there will be tools that help a financial institution investigate erroneous or suspected fraudulent transactions. Combating fraud is a dynamic endeavor, so the service will be offering more fraud-prevention tools over time.

Educating financial institutions about the value of the service and all tools offered within the service is also on the agenda. For example, in the aftermath of the bank closures earlier this year, some have raised concerns that the ability to move money quickly at all times of the day and night might exacerbate a bank run. It is true that FedNow and other payment services can be used to move money; however, banks have tools they could use to mitigate large outflows of deposits. For example, within FedNow they could lower their transaction limit, restrict access to the service to certain non-wholesale customers, or change to "receive payments only" status. They could also design their own controls to limit the total volume of transfers to manage their risks while serving their customers. Future releases of the FedNow Service may allow configurable transaction limits by customer type, if such limits are deemed useful. In addition to a bank being able to borrow from the Fed during the hours the discount window is open, a bank could use liquidity management transfers to replenish its master account balance from private funding sources on the weekend when the discount window is not accessible, which would help to mitigate the effects of deposit outflows on the health of the bank.

Interoperability

Another issue on the agenda is interoperability. The Fed is committed to working toward interoperability between instant payment systems. FedNow is designed on the ISO 20022 standard, which is already used by RTP and other payment systems globally, and that will help support interoperability through routing. Payment industry stakeholders have told us they want a real-time payment capability so that any payer can reach any payee, regardless of which faster payment system their banks use. Such interoperability has not always been a given in the U.S.; it took decades to achieve that for ACH and credit and debit cards and no doubt it will be a challenge for instant payments. But the Fed continues to engage with RTP to discuss how best to accomplish this goal.

Person-to-person and cross-border payments

Financial institutions would like to be able to use FedNow to offer person-to-person (P2P) payment services whereby customers can originate a payment using an alias such as an email address or phone number. The initial release of FedNow will not include a directory service that would be needed for P2P payments. Instead, a bank could use a private-sector directory to access routing information in order to transmit alias-based payments on FedNow. The Fed is looking at various approaches to provide alias-based payments as a way to enhance the FedNow Service in the future.

Another use case is cross-border payments. There continue to be frictions in moving retail payments across borders. FedNow is for domestic payments, but it has the potential to be used for cross-border payments in the future if legal, policy, and operational challenges can be solved.

Payment rails

A longer-run issue has to do with the payment rails themselves. It seems likely that over time those payments that are time-sensitive will shift from the traditional payment rails of check, ACH, and wire to the instant payment rails of FedNow and RTP. The timing and extent of such movements across payment rails are difficult to predict and will be affected by the pricing of payments services by market participants, as well as other factors. In thinking about the evolution of the payment rails, it may seem more efficient to have fewer rails for smaller-transaction payments, but those efficiencies need to be balanced with ensuring that the payment system has sufficient redundancy to remain resilient.

Conclusion

A well-functioning and secure payment system is vital to our economy. As we modernize the payment system, it is important to remember that the foundation of a successful payment system is the public's confidence in it. The public needs to be confident that the system will be: available whenever the customer needs it; efficient at routing and settling payments; resilient against cyberattacks and fraudulent actors; and reliable without the public having to know the intricacies of the infrastructure behind it. As the payment system evolves, the Fed, the industry, and end users will need to continue to collaborate to ensure that the modern payment system lives up to its promise of being efficient, safe, resilient, and available to all. That's the best way to maintain the confidence of the public the Fed serves.

References

Board of Governors of the Federal Reserve System, “Guidelines for Evaluating Joint Account Requests,” 2017. (https://www.federalreserve.gov/paymentsystems/joint_requests.htm)

Board of Governors of the Federal Reserve System, “The Federal Reserve Payments Study: 2022 Triennial Initial Data Release,” April 21, 2023a. (https://www.federalreserve.gov/paymentsystems/fr-payments-study.htm)

Board of Governors of the Federal Reserve System, “Federal Reserve Names Organizations Certified as Ready for FedNow® Service,” press release, June 29, 2023b. (https://www.federalreserve.gov/newsevents/pressreleases/other20230629a.htm)

FedNow blog. (https://www.frbservices.org/financial-services/fednow/blog)

FedNow website. (https://www.frbservices.org/financial-services/fednow)

FedPayments Improvement, “Faster Mobile Payments Go Mainstream as Gen X Usage Catches Up to Millenials,” *Federal Reserve Market Readiness Brief*, May 18, 2023. (https://fedpaymentsimprovement.org/wp-content/uploads/051823-consumer-research-brief-1.pdf)

Federal Reserve Financial Services, “FedNow Features: Settlement, Reporting, and Liquidity Management,” *FedNow blog*, July 9, 2021. (https://www.frbservices.org/financial-services/fednow/blog/fednow-features-settlement-reporting-liquidity-management.html)

Federal Reserve Financial Services, “FedNow Service Guide to Liquidity Management Transfers.” (https://explore.fednow.org/resources?page=11&id=84&resourceRole=fi&resourceTitle=guide-to-liquidity-management-transfers)

Federal Reserve Financial Services, “FedNow Service,” *Product Sheet*. (https://www.frbservices.org/binaries/content/assets/crsocms/financial-services/fednow/fednow-product-sheet.pdf)

Mester, Loretta J., “An Update on the Federal Reserve’s Efforts to Modernize the Payment System,” 2022 Chicago Payments Symposium, Federal Reserve Bank of Chicago, October 4, 2022. (https://www.clevelandfed.org/collections/speeches/2022/sp-20221004-an-update-on-the-federal-reserves-efforts-to-modernize-the-payment-system)

U.S. Census Bureau, “Quarterly Retail E-Commerce Sales Report,” May 18, 2023. (https://www.census.gov/retail/ecommerce.html)

Figures for
"An Update on the Federal Reserve's Instant Payments Service: FedNow®"

Loretta J. Mester*
President and Chief Executive Officer
Federal Reserve Bank of Cleveland

Summer Institute 2023
Macro, Money, and Financial Frictions
National Bureau of Economic Research
Cambridge, MA

July 12, 2023

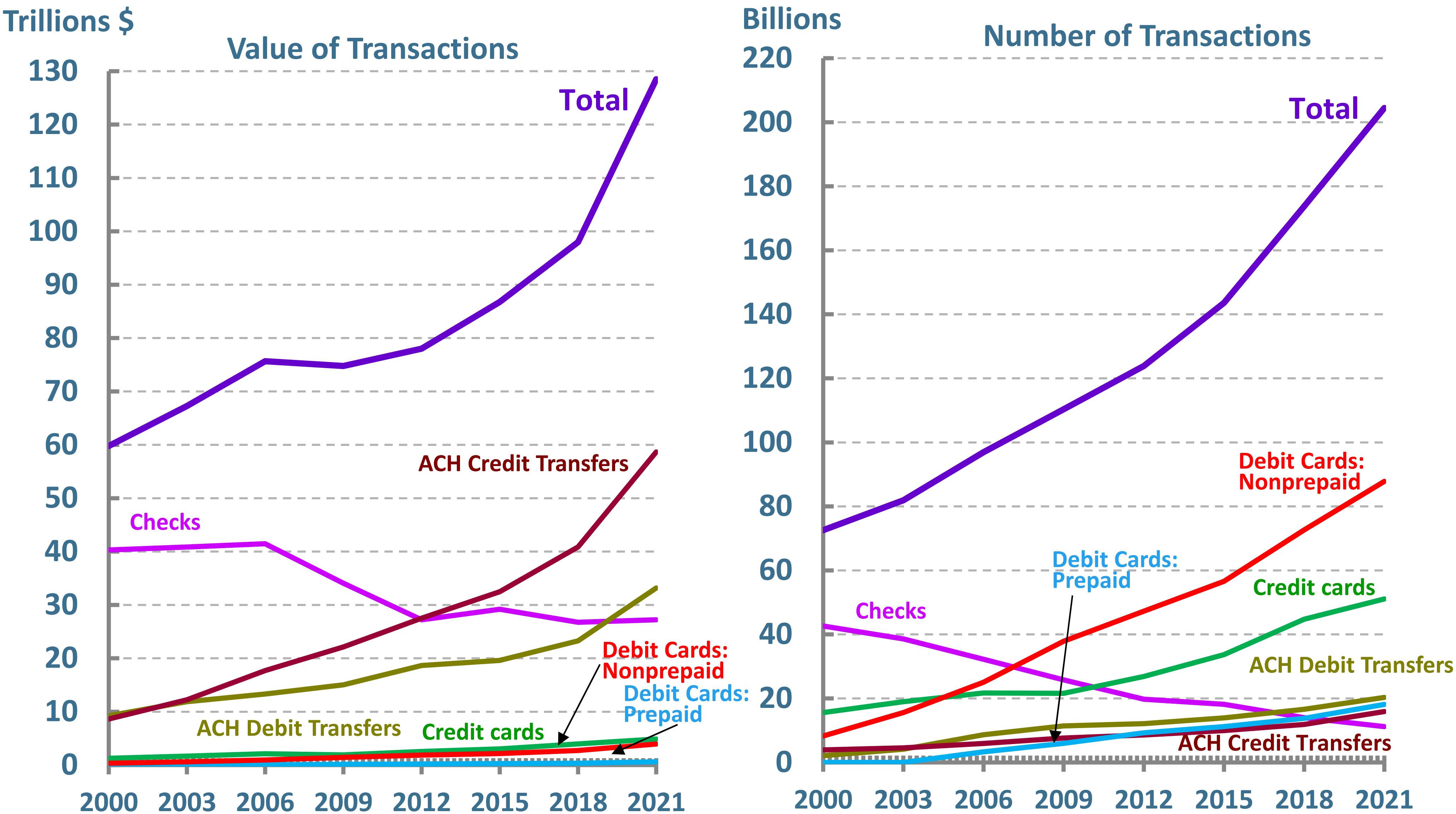
*** The views expressed here are my own and not necessarily those of the Federal Reserve System or my colleagues on the Federal Open Market Committee.**

FEDERAL RESERVE BANK
of CLEVELAND

Figure 1. Fed Payment Services

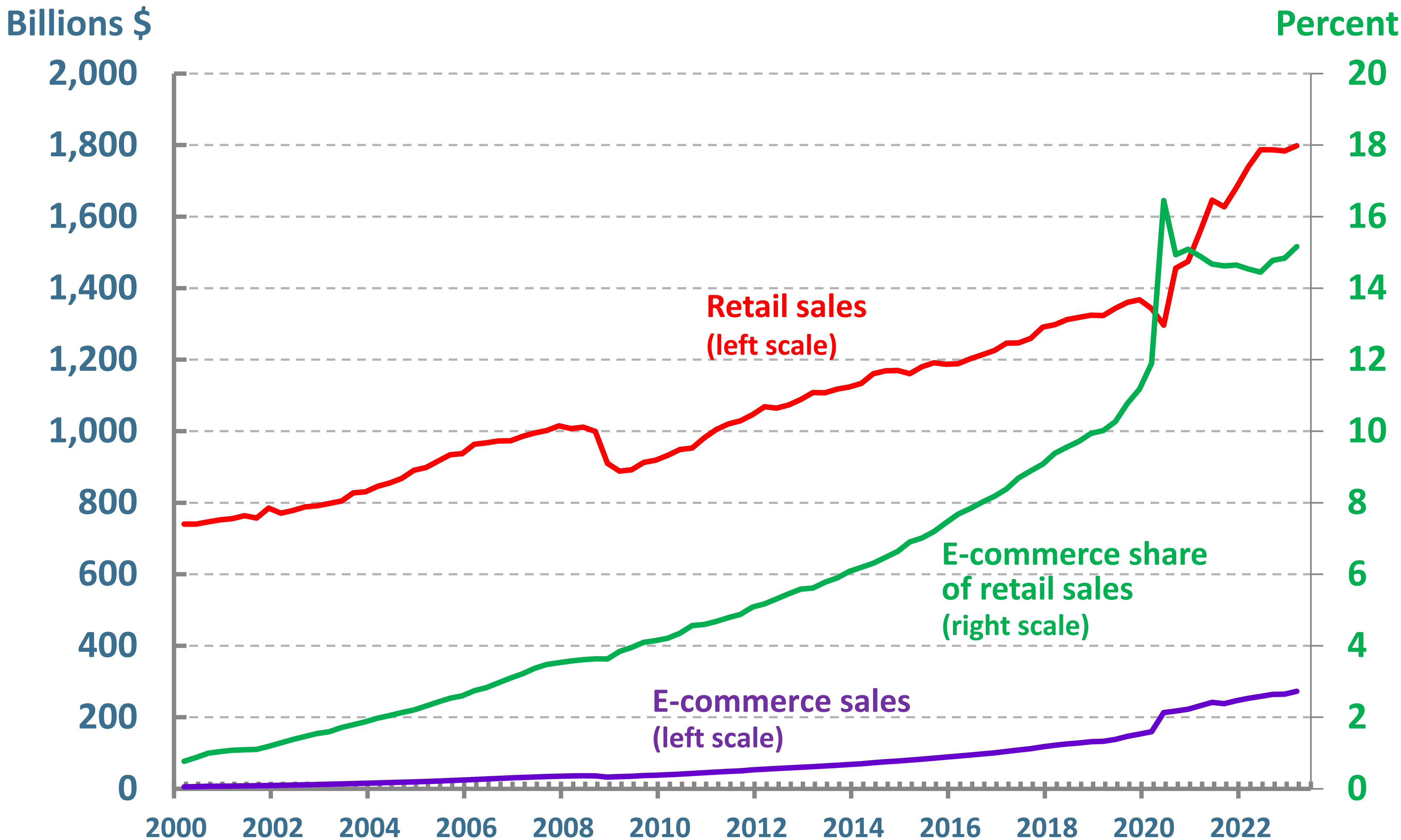
- Federal Reserve is responsible for fostering safe, efficient, widely accessible payments infrastructure
- Fed does not have plenary regulatory and supervisory authority over the U.S. payment system
- Federal Reserve Banks have a long history of providing payment and settlement services
  - Current Fed payment services: check processing, ACH, wire transfers
  - Settlement: interbank debiting and crediting of accounts to transfer funds for a payment
  - Clearing: exchange of information about a payment
- Fed offers payment services on behalf of the public in competition with and in support of private-sector payment services

Figure 2. The value of noncash payments grew rapidly between 2018 and 2021. About 205 billion transactions were made in 2021, over 600 per American.



Source: Federal Reserve Payments Study, 2022 Triennial Initial Data Release, April 21, 2023

Figure 3. The e-commerce share of retail sales spiked during the pandemic and has remained high



Source: U.S. Census Bureau, Quarterly Retail E-Commerce Sales Report
Quarterly data: Last obs. 2023Q1

Figure 4. The FedNow® Service

- FedNow is a 24x7x365 instant payments service with interbank settlement of funds within seconds
- Offered to banks and credit unions with settlement using Fed master accounts
  - Cloud-based but not distributed ledger
- Benefits
  - Flexible money management and ability to make time-sensitive payments whenever needed
  - Faster access to wages for some workers
  - Option for faster government payments in emergency or other situations
  - Increased resiliency, efficiency, access, innovation
- Will operate alongside TCH's RTP® service
  - Fed also supporting development of private-sector faster payments service

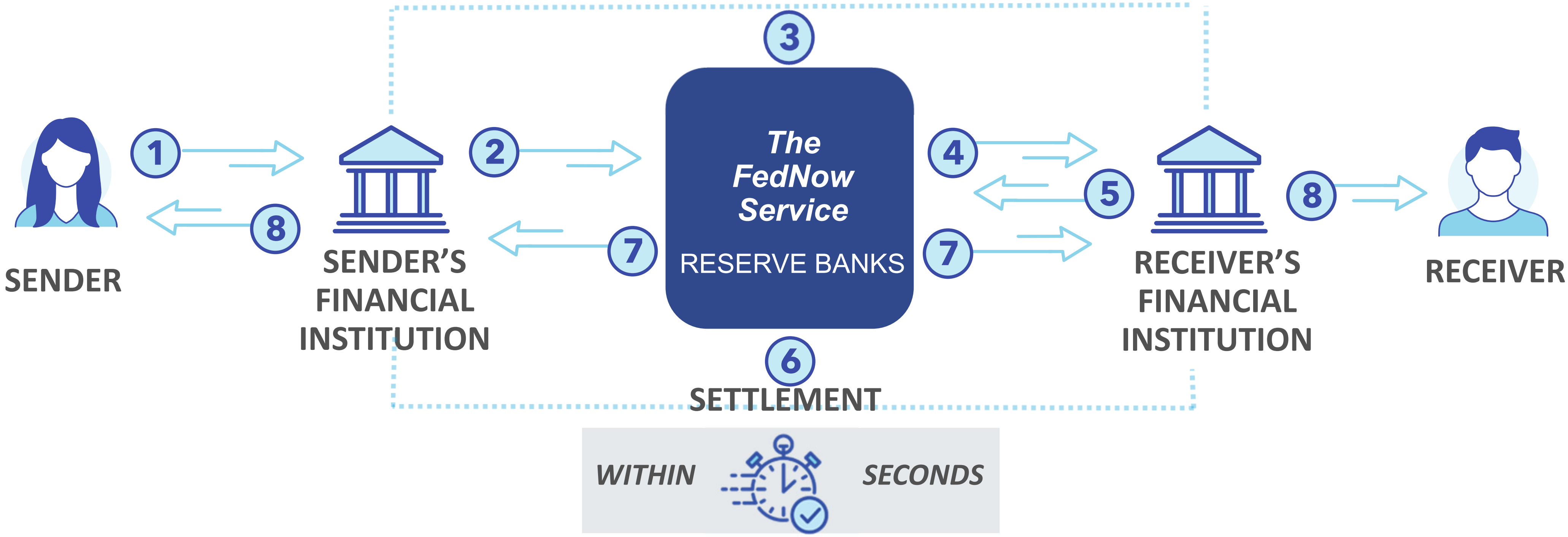
Figure 5. Features available when FedNow rolls out focus on core clearing and settlement

Core clearing and settlement

Service level	24x7x365	• Basic reporting	• High availability	• Access via FedLine® Solutions
Transfers	Credit push	• ISO® 20022 messaging	• Max transaction limit: $500,000 • Default setting: $100,000 • Send and receive or receive only • Negative list for suspicious accts	• Remittance info
Settlement	Master account settlement	• Correspondent/ respondent	• Seven-day accounting	• Intraday credit • Liquidity management transfers

Source: FedNow® Service

Figure 6. Steps in a FedNow® Service transaction



1. Sender initiates payment with financial institution
2. Sender's fin inst submits payment info to FedNow Service
3. FedNow Service validates payment message
4. FedNow Service sends payment message to receiver's fin inst asking if it will accept it
5. Receiver's fin inst tells FedNow it intends to accept payment message
6. FedNow Service debits and credits the master accounts of the sender's and receiver's fin insts, respectively
7. FedNow Service sends payments message forward to receiver's fin inst with an advice of credit and sends an acknowledgement to the sender's fin inst that settlement is complete
8. Receiver's fin inst makes funds available to receiver and credits the receiver's account

Source: FedNow® Service

Figure 7. Next steps on the agenda

- Growing the number of financial institutions using the FedNow® Service
- Educating the public and financial institutions:
  - fraud mitigation and depositor runs
- Interoperability
- Person-to-person and cross-border payments
- Payment rails

Figures for
"An Update on the Federal Reserve's Instant Payments Service: FedNow®"

Loretta J. Mester*
President and Chief Executive Officer
Federal Reserve Bank of Cleveland

Summer Institute 2023
Macro, Money, and Financial Frictions
National Bureau of Economic Research
Cambridge, MA

July 12, 2023

*** The views expressed here are my own and not necessarily those of the Federal Reserve System or my colleagues on the Federal Open Market Committee.**

FEDERAL RESERVE BANK
of CLEVELAND