Federal Reserve System
Docket No. OP – 1670
Federal Reserve Actions to Support Interbank Settlement of Faster Payments

Response to the Federal Reserve Board's Request for Comments

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This is my response to the request by the Board of Governors of the Federal Reserve System (Board) for public comments on the design of the new FedNow service. In addition, I provide some thoughts to help as the Board considers 24x7x365 operations for the Fedwire Funds Service (Fedwire) and the Net Settlement Service (NSS).

My comments reflect four decades of experience developing policy, working with standards organizations, and managing Federal Reserve services during the evolution to digital payments. These experiences include: leading the Federal Reserve's pricing of its banking and payments services following passage of the Monetary Control Act of 1980 (MCA), including check collection, Automated Clearing House (ACH), and Fedwire; serving as product manager for Fedwire and ACH from the mid-1980s to early-1990's; and developing new policy underlying the expansion of Fedwire operating hours while on the Board's staff.

A brief review of recent payment system history will help put current issues related to operating hours and pricing into context. As was intended by Congress, the Federal Reserve has been an active provider of inter-bank payments services since it was created in 1913. All major payments services now in operation were up and running and were provided to Federal Reserve System member banks without explicit charges until the time of the MCA. Following passage of the MCA, these services were, for the first time, priced and made available to all depository institutions for explicit fees. From the very beginning, service pricing was motivated by full cost recovery, was informed by economic analysis of payments markets, and was implemented in a transparent manner. Public comment was sought on all significant changes in price structure before adoption. Moreover, all significant changes in service attributes, including hours of operation, were carefully considered and included market research followed by Board requests for public comment. The changes on which the Board now seeks comment are part of a logical progression toward fully digital payments and around-the-clock banking operations in support of the broader economy.

My response has three main parts. The first part is a summary of major recommendations that are elaborated later in this paper. The second part addresses the immediate need to complete the decades-long transition to 24x7x365 Fedwire and NSS. The third part addresses the Board's specific questions regarding the new FedNow service.

**I. Summary of recommendations**

With respect to 24x7x365 Fedwire Funds and NSS operations:

1. Proceed without delay to implement 24x7x365 operations, which should be well in place by the time FedNow is up and running.

2. Extend the treatment of reserve balances held in master accounts to balances held in joint settlement accounts unless inconsistent with monetary control policy and practice.

3. Ensure that all Federal Reserve Bank procedures, processes, and systems needed to support 24x7x365 Fedwire, NSS, and FedNow services, including credit operations, are fully operational and ready to go when needed by the other services.

With respect to FedNow:

1. Engage and cooperate with The Clearing House (TCH) to achieve format inter-operability, whereby customer payments sent to originating banks can readily be directed by the originating banks to either the FedNow or RTP systems.

2. Design, build and operate FedNow using in-house Federal Reserve resources and, where necessary, domestic technology companies; that is, no outsourcing of major system components for this critical national infrastructure.

3. Set minimum end-user service levels that promote straight-through end-to-end processing of FedNow payments from sending customers to receiving customers.

4. Specify and require use of appropriate end-to-end security standards for faster payments made using FedNow.

5. Publish a multi-year FedNow business plan leading to full cost recovery.

6. Remain flexible about future FedNow price structure changes, allowing for modifications as experience is gained with the service; and provide assurance that all price structure changes will be based on economic and market efficiency and will be publicly vetted before they are adopted.

7. Recognize the Federal Reserve's historical role of "payments provider of last resort" when evaluating the competitive advantages and disadvantages faced by the Federal Reserve and private sector operators.

**II. Expansion of Fedwire Funds and Net Settlement Services hours to 24x7x365**

Business and policy developments over the last half century, enabled by technology advances, have moved banking inexorably toward around-the-clock operations and immediate settlement of payments transactions. The U.S. banking system is now on the threshold of true 24x7x365 operations and immediate settlement of the vast majority of payments. The Board's decision to proceed with FedNow for smaller-value transactions is a strong endorsement of 24x7x365 banking operations and immediate settlement of all payments. It is important that the Board not let larger-value payments, including settlement payments supporting private clearing systems, lag retail systems.

Banks' international activities and the role of the U.S. dollar as the most important global currency were initially responsible for expanded operating hours and increased demand for final settlement, resulting in today's 21-1/2 hour Fedwire day observed five days per week. More recently, retail payments systems have sought to compress their deferred net settlement schedules and have begun to converge on immediate settlement.

With the advent of faster payments, the U.S. banking system is now on the threshold of true 24x7x365 operations and immediate settlement. The Board's approval of the FedNow service is a strong endorsement of 24x7x365 banking operations and immediate settlement of all payments. Accordingly,

the Board's engagement with the industry to assess the relevant operational, risk, and policy considerations related to expanded and 24x7x365 operations for Fedwire and NSS should be undertaken with a positive bias. The recommendations below are intended to support adoption of immediate and final settlement in central bank money for both gross and net payments including RTP and ACH settlement transactions.

1. Proceed without delay to implement 24x7x365 Fedwire Funds and NSS operations, which should be well in place by the time FedNow is up and running

The Board's engagement with the banking industry to assess the relevant operational, risk, and policy considerations related to 24x7x365 Fedwire and NSS operations should be undertaken with a positive bias. With regard to Fedwire, the Federal Reserve has an opportunity to build on its long-standing leadership role by taking action now to adopt 24x7x365 Fedwire operating hours. The Federal Reserve has been a leader among central banks in expanding real-time gross settlement (RTGS) payments system hours and access, notably in 1999 with the adoption of an 18-1/2 hour operating day to support private sector development of what came to be known as Continuous Linked Settlement Bank (CLS Bank) for foreign exchange transactions. This action inspired similar initiatives by other central banks to expand the operating hours of their RTGS systems, thereby enabling final settlement in central bank money across currencies and time zones.

In contrast, many small-value or retail payments systems have continued to rely on commercial bank money for inter-bank settlement or on delayed settlement using central bank money. There is clear evidence of demand on the part of domestic retail netting systems, such as ACH, credit and debit card, and the like, for access to final central bank settlement and more timely, intra-day settlement and even immediate settlement. The Federal Reserve should do all it can to meet this demand for timely and immediate settlement of inter-bank obligations arising from privately-operated retail banking systems.

2. Extend the treatment of reserve balances held in master accounts to balances held in joint settlement accounts unless inconsistent with monetary control policy and practice

Adopting around-the-clock Fedwire operations will provide needed settlement support for those managing joint settlement accounts. However, under current terms, funds moved to joint settlement accounts from depository institutions' master accounts will increase reserve maintenance costs. This is because funds held in joint accounts do not earn interest at the Federal Reserve's overnight rate on reserves and, further, cannot be used to meet reserve requirement. While there may be sound monetary policy and reserve maintenance reasons for not treating funds in joint settlement accounts like reserves in master accounts, these reasons have not been clearly stated. The Board should rationalize any difference in treatment between balances held in joint settlement accounts and master accounts and, unless differences are well rationalized, change its policy to treat these balances in a similar way.

3. Ensure that all Federal Reserve Bank procedures, policies, practices, and systems needed to support 24x7x365 Fedwire, NSS, and FedNow services, including credit operations, are fully operational and ready to go when needed by the other services

Prior experience with expanded Fedwire hours illustrates how other central bank functions need to adapt their processes, Discount Window and credit risk management in particular. Payments systems in general, and large-value payments systems in particular, are mechanisms for extending credit from banks to system participants. These credit extensions and their attendant credit risks can be very substantial in the case of large-value systems. Accordingly, appropriate controls and arrangements for making credit decisions are part of the design challenge when operating hours are extended.

There was a time, before the risks associated with intra-day credit were fully recognized, that the Discount Window closed around 5 PM (Eastern Time), before the completion of Fedwire processing and exchange of Fedwire transfers made to fund the Clearing House Interbank Payments System (CHIPS) settlement. It became apparent with the expansion of Fedwire operating hours in 1999 that risk management and Discount Window support would need to be available at least until the close of the current banking day and the completion of final inter-bank settlement using Fedwire. Accordingly, Federal Reserve functions such as Discount Window and risk management, including collateral management, became to be seen as closely tied to settlement operations through Fedwire.

The Board's adoption of true 24x7x365 operations for Fedwire and NSS will have practical implications for other Reserve Bank functions, including the Discount Window, overdraft monitoring and control, collateral management systems, and the like. The Board needs to assure that the Reserve Banks are fully prepared, procedurally and operationally, across inter-related operational functions as they cross the threshold into 24x7x365 operations.

**III. FedNow design and management**

The Board is requesting comment on all aspects of the FedNow service and has stated that it intends to convene industry groups and forums to gather input. My comments below are intended to help identify the most significant design and management considerations during the information-gathering phase.

1. Engage and cooperate with The Clearing House (TCH) to achieve format inter-operability, whereby customer payments sent to originating banks can readily be directed by the originating banks to either the FedNow or RTP services

The Board has indicted that it agrees with public views that interoperability between "faster payments" services is desirable, but also that interoperability may be difficult to achieve, at least at an early stage. At the same time, the Board indicates that the principal benefit of interoperability is extending the national reach of faster payments services, and that national reach does not necessarily depend on interoperability.

The Board should define what it means by interoperability in clear operational terms so that all concerned have the same understanding of what the goal is. The goal can and should be an achievable level of interoperability between FedNow and The Clearing House RTP service at the time FedNow goes live. Below I explain what is, hopefully, a practical and achievable approach to interoperability that promotes both national reach and infrastructure resiliency.

Interoperability between systems that process final payments in real time is indeed difficult to achieve, if interoperability is defined to mean intermingling and sharing key processing steps: call this "process interoperability." Process interoperability is difficult, if not impossible, to achieve for a final payments system because of the risk that one system would take by ceding control over settlement decisions to another system, when the settlement assets cannot be returned or recovered once delivered to the receiving party. The barriers to process interoperability that arise in connection with final payments systems are not present in the case of payments systems like check and ACH whose designs and rules provide for deferred settlement and return of disputed payments. It is hard to imagine any bank, much less a governmental bank like the Federal Reserve that has unique money-creation powers, ceding such control over its settlement assets – central bank money – to a private party. Process interoperability is not feasible for real-time gross settlement systems, such as Fedwire and CHIPS, and is unlikely to be so for new real-time gross settlement systems providing payment finality like FedNow and RTP.

However, it is possible to envision cooperation between FedNow and RTP that results in the adoption of standardized formats for sending credit transfers that will allow sending banks to choose where to route the transfer, that is, either to the FedNow or RTP system: call this "format interoperability." If all faster payments credit transfers are originated using a standard format, beginning with the sending customer and then continuing with the sending bank, then sending banks that choose to do so could subscribe to both the FedNow and RTP services, and route transactions to either channel. Once a sending bank chooses the route the payment order will take, either to FedNow or to RTP, then that payment order is committed to the selected inter-bank processing channel.

Format interoperability will promote national reach as well as resiliency in national infrastructure. Resiliency is achieved because sending banks have "on call" redundancy if and when needed. An additional benefit is enhanced competition between the two inter-bank service providers, as sending banks are readily able to choose whose service to use based on the relative advantages the respective services provide.

It should be emphasized that format interoperability is based on standardizing the customer-facing experience when sending payment orders. A standardized customer-facing format will not signal to the customer how the payment order will be processed in the banking system. Any branding on the payment order will be that of the sending-customer's bank, not that of the inter-bank clearing and settlement system. This is analogous to how payment systems like check and ACH work today – the customer public does not know (and need not care) how the payment instrument he or she is using is handled in the banking system.

2. Design, build, and operate FedNow using in-house Federal Reserve resources and, where necessary, domestic technology companies; that is, no outsourcing of major system components for this critical national infrastructure

Final and immediate payments made digitally, such as those enabled by FedNow and RTP, have the potential to dominate the markets for small-value retail and business payments. My view is that this new method of payment will rapidly displace check writing and, over time, become a preferred substitute for certain types of ACH credit transfers. It follows, therefore, that the reliability and resiliency of the national infrastructure for final and immediate digital payments systems will be critical to the smooth functioning of the nation's economy. Any interruption, no matter how small, will be unacceptably disruptive to business. Large-scale disruptions from whatever source – natural disaster, physical or cyber-attack, or inherent operational weaknesses – would destabilize the nation's economy.

The Board expects that "the recently established private-sector RTGS service is likely to remain the sole private-sector provider of RTGS services for faster payments in the United States." This means that the U.S. economy will rely on only two inter-bank systems, FedNow and RTP, to process faster payments.

Public descriptions of RTP indicate that its processing platform is provided by VocaLink, a U.K.-chartered company recently acquired by MasterCard. Public information indicates that VocaLink supplies the foundational infrastructure for several faster payments systems, including Faster Payments Service in the UK and Fast and Secure Transfers (FAST) in Singapore, and now RTP in the US. Building RTP using an established payments platform provider likely provides business benefits including quick time to market and cost-efficiency. However, any outsourcing, no matter how carefully envisioned and managed, results in some loss of control, especially if the organization to which business functionally is outsourced operates off-shore, is subject to the jurisdictions of a foreign nation, and can be bought out by a high bidder in the future.

The Board has stated that FedNow will provide public benefit in part by adding inherent redundancy to the critical national infrastructure for immediate digital payments. This public benefit will be achieved only if the Federal Reserve has proprietary control over all major aspects of FedNow design and operation, especially the business application software and processing platform. Therefore, I recommend that the Board require that the Reserve Banks maintain ownership and full operational control over all major FedNow operations, without any outsourcing of major system components.

3. Set minimum end-user service levels that promote straight-through end-to-end processing of FedNow payments from sending customers to receiving customers

The Federal Reserve Banks are bankers' banks, providing inter-bank clearing and settlement services to their bank customers soon to include FedNow. Banks' customers are the individuals and businesses that rely on bank deposit accounts to transfer and receive funds. For Federal Reserve Banks and private clearing houses, then, end-to-end processing has traditionally meant bank-to-bank processing. The real promise of faster payments is straight-through processing from the sending-bank customer to the receiving-bank customer: all three supply chain components defined by the Board – end-user services, interbank clearing services, and interbank settlement services – must work together seamlessly to fulfill this promise.

The Board is clear that FedNow will provide infrastructure to promote ubiquitous, safe, and efficient faster payments in the United States and support depository institutions' provision of end-to-end faster payments services. The Board is less clear about its expectations for the level of end-user services to be provided by banks participating in FedNow: on the one hand the Board states that "…use of the [FedNow] service would require participating banks to make the funds associated with individual payments available to their end-user customers immediately after receiving notification of settlement from the service" (see p. 73), while on the other hand the Board states that "The banks are responsible for debiting and crediting their customers' accounts and providing further notification to their customers that payment has been completed" (see page 74). The Board should be more clear about its expectations for bank-provided end-user services and whether and how it will promote if not require straight-through processing of FenNow payments from sending customers to receiving customers.

Achieving immediate and final payment customer-to-customer as opposed to bank-to-bank is the distinguishing and essential feature of faster payments. In this sense, the promise of faster payments exceeds that of payments made using large-value RTGS systems for which customers can remain in the dark about the status of payments they make and expect to receive until slower bank accounting processes catch up with RTGS processing. The Federal Reserve should seek industry and end-user input as to whether banks that participate in FedNow should be required to provide the "final mile" of immediate settlement in customer accounts, with immediate customer notification, as a condition of their participation.

Requiring participating banks to provide immediate settlement and notification for FedNow transfers could limit the take-up of the new service to the extent that some banks are not ready with their end-user services. This requirement may even delay somewhat the transition to ubiquitous faster payments. The Board should weigh the advantages and disadvantages of such a requirement, make its position on the matter explicit, and then incorporate the implications of its position in FedNow business and financial plans, indicating the extent to which requiring banks to provide the end-user services component may dampen initial demand for the service.

4. Specify and require use of appropriate end-to-end security standards for faster payments using FedNow

Experience with immediate and final faster payments systems in other countries highlights the importance of anticipating and mitigating new security challenges. These challenges are in part cyber-security challenges related to end-to-end system reliance on new technologies. The most significant challenges, however, arise because of new business processes that put initiation of immediate and final credit transfer payments directly in the hands of retail end-users. Faster payments allow individuals and businesses to originate immediate and final payments from mobile devices, across virtually any wi-fi network, at any time of day. The new faster-payments business processes will require that special attention be given to authentication of FedNow payments at the point of end-user origination.

Two-factor authentication is quickly becoming the de facto standard for retail banking. However, the two-factor authentication methods typically used today – a combination of password and call-back/text-back security code -- may be obsoleted and easily defeated by the time FedNow is deployed in 2023 or 2024. For example, the integrity of cell phone and text-based authentication is now being called into question due to vulnerabilities such as SIM swapping. It is very possible that FedNow payments will require more secure multi-factor authentication than is generally available today to ensure their end-to-end integrity. The Federal Reserve should work with the banking industry to identify needed authentication techniques, incorporate these techniques into the FedNow design, and adopt minimum security standards that participating banks must follow for their end-user services. Banks participating in faster payments systems should have available and follow an industry-agreed minimum standard for security analogous to the Payment Card Industry Data Security Standard.

Similarly, the directory process used to map common end-user addresses to bank accounts needs to be rigorously managed and protected. This is especially so if directories are relied on to translate public identifiers, such as telephone numbers, into private addresses such as bank account numbers. For the reasons noted above, telephone numbers (and e-mail addresses) may prove to be weak links in addressing systems, as they are in authentication systems.

The Board should attach the highest priority to forward-looking end-to-end security for payments made using FedNow. Now is the time for out-of-the-box thinking and willingness to consider specialized end-to-end security methods for faster payments that exceed those associated with applications needing lesser security but that share the real estate on consumers' cell phones. Examples for authentication may include physical tokens (something I have) and bio-metrics (something I am). Examples for destination addresses would include variants of public keys in a Public Key Infrastructure (PKI) environment and "receive only" bank accounts that are linked to a consumer's master account within his or her bank.

5. Publish a multi-year FedNow business plan leading to full cost recovery

The Board has stated that it expects that FedNow service cost recovery will not occur until after 10 years and that fees will be set to recover costs associated with mature volume estimates. The Board further notes that this approach to cost recovery is consistent with that used for the ACH service. It may well be that it takes ten or more years for the FedNow service to reach business maturity. This is especially so if the Federal Reserve follows the above recommendations by requiring that participating banks a) provide end-user services that support the intended design for immediate and final payments and b) meet very strong security standards.

The Federal Reserve should publish its multi-year business plans for FedNow, and its multi-year targets for cost recovery should be clearly laid out in these plans. Doing so would follow the example of the ACH service that the Board cites. Cost recovery and transaction volume forecasts should, to the extent

possible, estimate the dampening impact of policies requiring participating banks to provide robust end-user services with very strong security. Clearly communicated and appropriately updated business plans will help all stakeholders understand the path toward mature cost recovery and assist in their business planning.

The Board should specifically elaborate two aspects of the FedNow business plan. First, will under-recovery of costs during the start-up period be made up once the FedNow service reaches business maturity? Second, will the Private Sector Adjustment Factor (PSAF) used for FedNow be adjusted upward to reflect the additional risk a private entity would assume in bringing a new service to market? These are the kinds of practical questions that need to be identified and addressed in light of the unique status of FedNow as a significant *de novo* service never before offered.

6. Remain flexible about future FedNow price structure changes, allowing for modifications as experience is gained with the service; and provide assurance that all price structure changes will be based on economic and market efficiency and will be publicly vetted before they are adopted

I am aware of recent public statements that extol the virtues of simple, single-price fees for inter-bank clearing and settlement of bank faster payments services. Such statements include those made by The Clearing Hours at the September 25, 2019, United States Senate Committee on Banking, Housing, and Urban Affairs hearing, "Facilitating Faster Payments in the U.S." This simple approach to pricing has some appeal, especially when an entirely new payments service is introduced to the market, and in fact is characteristic of pricing schemes that have been tried in the past. For example, as I recall, initial pricing of Federal Reserve check and Fedwire services was based on a simple calculation of cost divided by forecasted volume to yield a single "penny price" applying to all transactions.

However, experience shows that somewhat more complex price structures are better at promoting market efficiency and providing incentives to promote desirable business practices (for example, encouraging the timely adoption of technology upgrades). The Board appropriately notes that FedNow fees may initially reflect multi-part pricing to include a per-item and fixed fee, and that fees may differ based on the type of transaction being processed (for example, payment, request for payment, service message, etc.). Experience with new inter-bank clearing and settlement services such as FedNow may, however, lead to price structure modifications that help achieve needed efficiency and safety. Historical examples that come to mind include: volume discounts that increase total transactions volume, lower per-unit production cost, and allow price reductions benefiting all participating banks whether large or small; incentive or penalty fees that encourage participants to migrate to new technology platforms, thus supporting earlier rather than later retirement of old and duplicative production systems; time-of-day pricing that incents users to efficiently spread their payments across the production day; etc.

It is important that the Board remain flexible so that economically-efficient changes in the FedNow price structure are part of the management tool kit as the service matures and as efficiency and technology improvements present themselves. The Federal Reserve could help all stakeholders by providing some concrete historical examples of price structure changes made over time to services that have progressed along the continuum from paper, to electronics, to digital, including check, Fedwire, and ACH. Of course, it is also important that the Board assure stakeholders that all contemplated price structure changes will be well rationalized on the basis of economic efficiency and will be vetted with the public following the Federal Reserve's normal consultative process.

7. Recognize the Federal Reserve's historical role of "payments provider of last resort" when evaluating the competitive advantages and disadvantages faced by the Federal Reserve and private sector operators

The Board has asked for comments on its analysis of the difference between the FedNow service and the private-sector service (aka RTP) that may affect the relative competitive advantages and disadvantages that each has. I would like to note one competitive disadvantage that is unique to the Federal Reserve and that the Board does not mention – payments provider of last resort. Historically, and across all of the inter-bank payment services it provides, the Federal Reserve has taken action to ensure stable payment system operations during times of stress and crisis. These episodes include financial crises as well as natural disasters or terrorist attacks that destabilized payments infrastructure and processes.

Financial crises include cases when private clearing arrangements have essentially excluded bank counter-parties from participating in net or gross settlement schemes by denying the troubled banks any private credit, whether collateralized or not (net debit caps set to zero). In a number of such cases that I have personally experienced, the Federal Reserve has mobilized its capabilities to keep payments flowing through Federal Reserve clearing and settlement channels while also managing its counter-party risk.

The historical record is replete with examples of Federal Reserve support to ensure smooth payment system operations during natural disasters. While this support is provided in concert with the entire banking system, locally affected Federal Reserve Banks are able to rely on the national System of Reserve Banks to help ameliorate local problems. Obvious examples include provision of cash services but also manual work-arounds that allow banks to manage their electronic settlements throughout the banking system.

Finally, it is worth elaborating on the role the Federal Reserve played nationally to help keep the nation's payment system functioning around the time of the September 11, 2001, terrorist attacks. From personal experience, I can speak to the significant role played by a resilient communications network in keeping banks connected to inter-bank financial communications and essential payments services, including Fedwire. In addition, it is worth remembering that the Federal Reserve kept the national check clearing system operating by agreeing to clear checks that could not be presented on time due to the shut-down of air transportation: the Federal Reserve Banks accepted checks for collection and provided credit for these checks based on published clearing schedules, notwithstanding that the checks could not be presented in a timely manner to paying banks around the country. The Reserve Banks absorbed the resulting float costs of doing so.

Incidents such as those alluded to above require not only a strong sense of mission but also operational commitments that add to the Federal Reserve's costs, costs that are recovered through fees charged for Federal Reserve services. Payments provider of last resort is not only a uniquely significant contribution to financial system stability but also a unique competitive disadvantage for the Federal Reserve. This is in part because the Federal Reserve's mission requires that systems be designed and operated at a grade above "commercial grade," leading to higher costs that are recovered through prices for services.

**Thank you for the opportunity to comment on these important matters.**