M. Balakrishnan Ph.D. **United States of America**

Date: 7th November, 2019

Ms. Ann E Misback,
Secretary, Board of Governors of the Federal Reserve System,
20th Street and Constitution Avenue NW, Washington DC 20551. USA

(via electronic submission to regs.comments@federalreserve.gov)

Respected Ms. Misback,

Sub: Docket No OP-1670

I appreciate the opportunity provided to me to comment on the notice and request for public comment on action to support interbank settlement of faster payment, as well as to suggest area of the proposal that could benefit from additional research or clarification.

I am a professional with over 25 years of experience in banking technology / payments with global banks such as ABN-AMRO & Citibank, nationally important organization National Payments Corporation of India and international developmental organization World Bank. While I was involved in connecting the banks with various then existing payment systems while working for the banks, as a Chief Operating Officer of National Payments Corporation of India, I was involved in connecting many banks to multiple payment systems in India – including the Faster Payment system (known as IMPS or immediate payment service) back in 2010. I have also supported and observed the Faster Payment system implementation in multiple countries by virtue of my role with the Payment System Development Group, World Bank and my keen interest in this space. I have also written a paper on 'Real-time Retail Payment Systems or Faster Payments: A Quick Framework for decision making' in Journal of Payment Strategy & Systems where I proposed a framework for developing countries for implementing the faster payments. My recommendations are based on these experiences and knowledge on faster payments.

Given that over 50 countries in the world have already implemented Faster Payments and in many of those countries Faster Payments have grown phenomenally as well, I strongly support the step that the Federal Reserve Bank (FED) is taking in implementing the faster payment solution - FedNow - for the United States. I believe the FedNow service would be an enormously useful and necessary solution to bring Unites States on par with the rest of the world and provide new age payment solution to its people. I believe a system with reduced complexity, rich functional capabilities to support quick and efficient on-boarding of banks/institutions, cost effective and accelerated implementation of the solution would add tremendous value to United States and its people. Towards that, I have attached some of my comments / views and observations for your kind consideration. The key points are:

a) While FED priority for a real time gross settlement for FedNow is abundantly clear in the note, there may be merit in reconsidering that decision and instead look at net settlement with appropriate risk mitigation measures until the volume/value reach a level to cause a settlement/systemic risk. This would help to delink the FedWire/RTGS development with FedNow development and simplify the implementation.
b) FED should consider providing alternate message formats such as ISO8583/ACH for participants and provide a message converter to ISO20022 to facilitate faster on boarding of participants. A related suggestion was to use the TCH RTP message formats that are already available in public domain subject to their concurrence.
c) FED should consider providing an Application programming interface (API')s through the internet with appropriate security measures as an option for member banks / third party payment service providers to connect to the FedNow system. This would facilitate quicker integration, faster on boarding of institutions and lower the costs for many institutions.
d) FED should consider a phased implementation approach with basic credit transfer with net settlement capabilities, global identifiers & decentralized directories, APIs for connections, and message converter as the key requirement for Phase I and rest for Phase II.
e) FED should consider fast track implementation by going in for a standard off the shelf solution with minimum customization. Phase I implementation in about 18 months should be possible.
f) FED should be creative in writing up the systems requirements so that system integrators could come up with innovative and creative architecture/solution/plans that would lower the total cost of operating the system.

Please note that these comments / observations / suggestions are my personal views as an individual and they do not reflect views of the organizations that I was involved with in the past or at present.

I once again appreciate the opportunity to comment and am happy to discuss further should the Federal Reserve Bank have additional questions or clarification on my observations.

Sincerely,

M. Balakrishnan.

Enclosure: Detailed comments

FedNow: Comments/Observations by M. Balakrishnan, Ph. D.

Docket No. OP: 1670: Federal Reserve Action to Support Interbank Settlement of Faster Payments:

B. General Description of the service:

1. Settlement:

While the Fed's preference for real time gross settlement for FedNow transactions are abundantly clear in the note and today's powerful technology is indeed capable of handling large volumes, the need for settling every single transaction in the FedWire/RTGS system on a gross basis may not be required till the volume/ value of the FedNow reaches a level to create settlement/systemic risk. Following are the rationale.

a. Today, an interbank ATM cash withdrawal transaction is akin to faster payments. Just that the money is being handed over to customer instead of crediting his/her account. Many billion ATM cash withdrawal transactions happen in the US and they are not instantly settled – rather settled on net basis next business day.
b. In 2018, there were 23.00+ billion ACH transactions for an amount of USD 51.2 Trillion – with an average transaction value of approximately USD 2200.00. These are settled on net basis and if one were to calculate the net settlement amount each day, that would not be substantial in comparison the amounts settled in FedWire daily.
c. In FedACH, for the Q2 of 2019, there were 3.878 billion transactions for an amount of USD 6.97 Trillion with an average transaction value of USD 1797.00. These are also settled on net basis. This represents an average daily volume of 60.6 million transactions for a value of USD 108.9 Billion. The actual amount settled on net basis would be substantially less.
d. In contrast, in Q2, the FedWire settled just 42 million transactions, but for a value USD 169.76 Trillion, giving a daily average volume of 659,000 transactions for USD 2.65 Trillion. and average transaction value of USD 4.02 million.
e. Although the FedAch volume is 90 times the FedWire volume, the value is only about 4% of the FedWire value for the quarter 2, 2019. Since the actual net settlement amount for FedACH is still less, the value settled for FedACH would be even lower as % of value settled in FedWire.
f. According the NACHA, the same day ACH volume for Q2 2009 stood at 25.1 million for debits and 34.7 million for credits totaling 59.8 million transactions for that quarter. It is likely that for the year 2019, the total transactions for same day ACH would be in the region of 250 million transactions. These transactions are also settled on a net basis – multiple times in a day though.
g. Zelle, an instant payment mechanism in the USA reported 171 million transactions for about USD 44 Billion for Q2 2019. Zelle does not settle every transaction in FedWire/RTGS system.
h. The other faster payment system in the country RTP, does not settle every transaction in FedWire/RTGS. An entry in the books of RTP for debit and credit is considered final and irrevocable and the risk is managed with a prefunded joint account with Fed with balance covering the exposure.
i. A quick analysis of the FIS Flavors of Fast Report (2019) highlighting the various aspects of 54 faster payment schemes across the world indicate that majority of the countries have chosen net settlement option with appropriate settlement risk mitigation measures.
j. With a net debit cap, transactions can still be handled within the FedNow system on gross basis as explained in the next section.

The volume of FedNow will take 2-3 years' time to get to 500 million transactions and considerable value and therefore, gross settlement may not be necessary initially. It is suggested that FedNow while making the funds immediately available to end users, should delink the settlement from the actual transaction and look at net settlement along with appropriate risk mitigation measures. The risk mitigation measures could be the net debit cap which is fully collateralized as explained here.

Suggested Approach for Settlement for FedNow with Net Debit Cap and net settlement:

Every participating institution can be mandated to assign acceptable securities to Fed to cover their obligations in the FedNow. (In RTP, they prefund their joint account.) Based on the securities collateralized or assigned to FedNow service, FedNow can determine a maximum net debit cap after applying applicable hair cut on securities. This net debit cap is the maximum debit exposure that a participant can take in the FedNow system. When the system starts, participant would start with a net debit cap and a zero utilized amount. Every time, a successful credit or debit happens to the participating institution, net debit cap utilized amount will be adjusted appropriately for sender and receiver banks and checks applied to ensure that the institution utilized amount does not exceed the net debit cap. Once the periodic settlement cycle is run and the net settlement amounts are settled in FedWire, the net debit cap utilization amount can be adjusted / expunged for settlement already completed and the process can carry on. There are several advantages to this approach:

a) Within the Fednow system, they are in any case handled in a gross manner as every transaction impacts the utilized amount.
b) FedWire large value payment system would continue to handle only large value transfers and settlement transactions from feeder systems as it is doing currently.
c) Operational and technology risk would be reduced substantially.
d) There will not be any additional risk generated in the system because of the net debit cap concept and by ensuring that is fully collateralized.
e) The FedNow implementation complexity/dependency would be substantially reduced as this will not call for any major changes or upgrade of FedWire system and that dependency.
f) The overall cost of FedNow implementation would be substantially reduced.

On a separate note, it is suggested that Fed could do a detailed study on what volumes and value levels the retail payment system could become a systemic risk and therefore, should look at gross settlement option for them in FedWire. It is felt that if the settlement value of a retail payment system reaches 10% of the gross settlement system values in the country, that would be the time to look at retail payment systems as systems that could create settlement risks/systemic risks and the need for gross settlement.

Fed should separately, but in tandem, continue its work on making FedWire/RTGS service and NSS service available on a 24*7 basis independent of FedNow and that facility should be made available to all payment system operators.

2. Inter-operability and Portability:

On inter-operability of FedNow with other faster payment service in the country, it is a desirable feature for many reasons and should be explored and implemented as soon as feasible and ideally as a day one feature. The other aspect that the FedNow could consider is portability of the payment systems. While the inter-operability would help interaction between two different systems, portability would ensure the ability to route the transactions to alternate available systems should one of the systems fail. Of course, this would be possible only for those institutions that are connected to both

systems and if certain messaging and network communication protocols are standardized and followed by the different scheme operators. Given that top 50 institutions would probably have bulk of the transactions and would also have the wherewithal to do this, this should be considered to ensure that large number of customers are not impacted if one system goes down completely.

C. Discussions on specific features and functionality:

1. Message standard:

It would be interesting to note that not all faster payment systems in the world are using ISO20022 message formats. Some of the successful faster payment systems even today use the ISO8583 message format. The decision on message formats must be based on many considerations. For example,

a) What kinds of payments are being considered? The ISO8583 message format has stood the test of the time and has been very successful for many years in doing billions of ATM transactions, POS transactions, E-commerce transactions and M-commerce transactions. More recently, in many countries this has been extended to do other kinds of transactions like P2P instant payments including push payments to merchants. So, for a variety of retail real time payments including merchant payments, ISO8583 message could serve the purpose very well.
b) Re use of existing resources: The ATM/POS/E-commerce/M-commerce infrastructure is well established in the US and achieved ubiquity as well. The same is true with ACH systems. Institutions have created operational and business process to handle these transactions and they include instant transaction processing and fraud management procedures for online transactions. The institutions are familiar with the message formats and procedures and processes are there to handle these formats.
c) The cost of implementation of new message formats: The new message format may have implications on costs both from a system implementation perspective as well as network bandwidth perspective. ISO20022 messages are relatively large and may need increased bandwidth as well as opposed to compressed bit map based ISO8583 message formats.
d) Availability of resources with knowledge of ISO20022: ISO8583 has been in existence for over 5 decades and there are lot of knowledgeable resources available on this message format in most of the countries including USA. The ACH and FedWire formats are also well understood in the country and many resources on them are available. The same may not be true for ISO20022 message format - although it is becoming a global standard.

Given these facts, while the Fed's decision to use ISO20022 messages is indeed appropriate and future proof, it is suggested that FedNow consider offering some flexibility in the message formats for participating institutions. While the FedNow could be completely run using ISO20022 message formats internally in its system, providing the options for financial institutions to send / receive in ISO8583 format or ACH format of FedWire format would be of immense help. As part of the FedNow system, it could get a message converter capability that could covert ISO 8583 or ACH or FedWire format to ISO20022 and vice versa based on mapping so long as the other message format has enough data to cover the minimum requirement for ISO20022 message. If this capability is there, then institutions can join the scheme with their existing message formats as they can send and receive the message in those formats. Over a period, when they have to move to ISO20022 for other systems, that time they could migrate for FedNow as well. Such an approach would also reduce the learning curve for participating institutions.

Fed could also consider adopting the ISO20022 messages standards already adopted by RTP (subject to intellectual property rights and concurrence from TCH) for FedNow as well as it would help in inter-operability and portability. Those specifications are already in the public domain.

2. Settlement Account:

The user of same master accounts that settle other transactions like FedWire and ACH net settlement batches is beneficial. However, consider the following aspects before finalizing this.

a) Today, only large value transactions and transactions originating from national settlement service use the master account for settlement. The number of such transactions are low.
b) Settling billions (eventually) of retail transactions on master account on a gross basis would call for significant investments to upgrade and maintain and this could increase the cost of all payment instruments.
c) By merging the FedNow and large value settlement on a gross basis in the same system, the operational risk of large value system not being available increases substantially. On top of this, if anything goes wrong, both large value payment system and retail payment systems in the country are put to huge risk.
d) Even in the RTGS systems for large value payments, many countries have implemented interesting Liquidity Saving mechanisms like netting to reduce the liquidity requirements for the participants in the system.
e) Retail payments, by its nature, do not create substantial liquidity or credit risks. As explained, the billions of ATM, POS, ACH transactions are settled on a net basis. The value of retail transactions is fraction of the RTGS transactions. For example, although the FedACH volume is 90 times the FedWire volume, the value is only about 4% of the FedWire value for the quarter 2, 2019. And if one considers the net settled amount in the batch for ACH, it is even less.

Therefore, there may be merit in keeping a separate sub account for this purpose only if every FedNow transaction is to be settled on a gross basis to keep large value and small value separate. However, if the earlier approach suggested for settlement is acceptable, having the same master account may be a better option as the number of entries on the master account of FedNow settlement will not be too many for net settlement.

3. Seven day accounting regime:

This is a good initiative. The FedWire and NSS availability on all seven days of the week including holidays would be very helpful.

4. Business Day:

Aligning the FedNow business day with FedWire business day is appropriate. It would be even more beneficial if all participants, FedNow and FedWire adopts business day as per calendar day for the purpose of Fednow transactions. However, if the participating banks can use a different business day, the customer impact should be looked at. For example, customer makes a payment on Friday 11.00 PM. If the receiving institution credits funds immediately with a value date of Monday, would it result in late fees and penalties if the transaction relates to repayment? On interesting bearing accounts, would customer get interest from Friday? These aspects to be discussed and finalised and should form part of customer communication.

5. *Liquidity and Credit*

Fed currently provide liquidity for the participating institutions in the form of intraday credit as per PSR policy. It is absence of Liquidity Savings Mechanisms in the FedWire, this temporary liquidity indeed helps smooth functioning of the FedWire service and extending that to FedNow is a welcome step. When FedWire also becomes 24*7, it would help things further as net settlement can be done any time, and money could be moved from one account to another anytime by the participating institutions.

FedWire already provides the capability to monitor the account balances real time and move money real time during the working hours of FedWire. Once the FedWire services are extended, it is assumed that the capability to view / transfer would also get extended.

In terms of monitoring the transactions and balances for FedNow, I believe it would be best done within the FedNow service. It is believed that RTP offer such capabilities for institutions to monitor within the RTP system and FedNow could also adopt the same approach.

6. *Network Access:*

Since FedNow has the objective of every financial institution – large or small – participation in this service to make it ubiquitous, it should also consider other cost-effective options for connecting to this service. Secured API based access is something that Fed should consider allowing institutions to connect to the FedNow system in a cost-effective manner. This would be very helpful for smaller institutions or institutions with low number of expected transactions.

The success of UPI (unified payments interface, an instant payment instrument used for P2P, P2M and other use cases and had 1.15 Billion transactions in October, 2019) in India is on account of open API's that permitted third party providers such as Google integrate UPI in their applications. Today, Google has a third of market share in UPI although they are not a bank. Therefore, FedNow offering comprehensive API's with full appropriate security measures which could be used by participating banks or by third party service providers would help accelerating the adoption of this service.

7. *Service Pricing:*

Pricing the FedNow appropriately and at the same time, recovering the cost with reasonable period is indeed challenging. In terms of pricing the products, FedNow ability is rather restricted because it cannot charge a price that is higher than the current FedWire charges. It also needs to be conscious about the same day ACH charges as well as the RTP charges. I think the pricing for the FedNow should probably fall in between – just marginally higher than the same day ACH charges but less than the FedWire charges. So, to that extent, the ability of FedNow to generate revenue with higher charges is limited. It must depend on volume growth to increase revenue and that means, it should get this service more ubiquitous and widely used as early and quickly as possible.

Another factor to consider is the pricing when every time a retail transaction is settled in FedWire/RTGS. For every transaction in FedWire, there would be FedWire charges. If the FedNow transaction charge is to include the FedWire charge as well, FedNow may overprice the transaction fee for small value transactions and impact the adoption levels. Therefore, even from pricing perspective, doing a net settlement for FedNow seems more acceptable.

That brings to focus the cost of this implementation. I think FedNow can be implemented in a cost-effective manner if the following things are considered.

a) Delink FedNow with FedWire/RTGS. As indicated earlier, if the FedNow implementation does not involve any significant changes or upgrade to FedWire, then complexity and costs come down. By creating the net debit cap concept for risk management and doing the periodic net settlement in the FedWire can achieve this.
b) Look at implementing a core real-time product with minimum customization effort. It is the customization that increases the cost and timeline for implementation. Given that the faster payment is implemented in multiple geographies (over 50 as per FIS report), there are a few off-the-shelf solutions available in the market.
c) Be creative in solutioning. For example, the volume will grow over a period. So, if the Request for Proposal can be structured in such a way that it supports twice the projected volume of the first 3 years initially, and then plan for an upgrade as volume rises, substantial savings could be achieved in hardware/system software/ application software licenses. (Will pay only for what will be most likely used, after 3 years, would have the flexibility to add H/W and S/W depending on the volume growth). The H/W costs keeps falling and therefore, one could leverage on that as well. Another idea is to see if the software can work on open source software. That would reduce a lot of licensing costs. A third idea is look at H/W & S/W combination for operating system and database management systems that would reduce the overall cost of operations.

8. *Request for Payment:*

While this is a desirable feature, given that bill payments could be done through credit transfers as well, and already many options exist for bill payments in USA, it would be better to look at this feature as Phase II. The initial focus should be to get the credit transfer capability up and running as early as possible.

However, if inter-operability/portability feature is being planned as a day one requirement for FedNow, then this Request for Payment feature should also be part of the day one requirement as RTP already offer this capability today.

9. *Directory service:*

It is not always necessary that the sender's bank must have the banking information of the receiver if directory services are implemented. Either the sender could contact directory and get the information, or the central system could contact the directory and get that information or if the payment message has receiving bank information, simply the message can be sent to receiving bank and they can resolve the account information based on virtual payment addresses. It all depends on the implementation. In order to increase the adoption of FedNow payments, directory services will certainly help. Therefore, ideally, the FedNow should support different kinds of directories / identifiers as explained below.

a) Global Identifiers: This is where the directory is not really required. The routing code and account number are global identifiers. Using the card number is also an example of global identifier.
b) Owned Central Directory: This is where the FedNow maintains the central directory. It could be based on the phone number or email id or any other such as virtual payment address. (I

prefer virtual payment address as it is not commonly known like phone numbers and email id.)

c) Third party central directory: FedNow can recognize certain already in existing third party central directories after due diligence.

d) Decentralized directory: This is where there is no central directory. But every participating institution capable or maintaining its own customer directory can maintain them and sender just need to know the address of that directory and unique id within that directory. For example, A bank ABC bank can provide a virtual payment address for its customer as John@ABC or Victor@ABC (so long as it is unique within the institution). It can map John or Victor to an account within ABC institution. So sender can send stating the beneficiary account details as John@ABC. Since @ABC is mapped to ABC bank within the system, the message is routed to ABC bank and they can resolve and credit the relevant account.

Decentralized directories and global identifiers reduce the complexities involved in implementing a central directory and the additional processing overhead and therefore preferable. Therefore, it is suggested that FedNow should look at using global identifies and decentralized directories in the first phase, look at connecting with existing central directory service providers in the subsequent phases. Only when all these measures do not get the required ubiquity, FedNow should consider creating its own central directory. If FedNow can ensure that the credit transfer can flow into credit cards / debit cards using the card number appropriately, it would immediately increase the usage of the system.

10. Fraud service:

FedNow may not be able to fully provide the details for fraud prevention as FedNow will not see all of customers transactions in its system and therefore, its ability to detect fraud is limited. FedNow will not see other transactions like cheques, ACH, ATM, POS, Internet Banking and Teller transactions. Therefore, the originating bank and destination banks (from the perspective of FedNow service) are best positioned to manage fraud. However, FedNow may be better positioned to understand and monitor fraud across participants. Therefore, as industry leader in this space FedNow should consider collecting the fraud data and sharing with the stake holders appropriately to help them manage the fraud better. The rules of FedNow service should facilitate the reporting of fraud and related data and sharing of that information among participants appropriately.

D. Implementation

There is a sense of urgency in implementing the FedNow for a variety of reasons as acknowledged in the notice. The faster payment is no longer a new solution, as already 50+ countries have implemented this solution in a variety of ways. There are multiple off the shelf standard solutions available supporting the ISO20022 message formats as well. Even in the US, a faster payment solution has been implemented and working for the last couple of years. Therefore, the 2023 and 2024 implementation timeline of FedNow looks too long. Ideally, it should be possible to implement this solution in 18-24 months' time frame. So a 2021 implementation is possible if following suggestions are considered.

a) De-linking FedNow system implementation with FedWire as indicated earlier. Let FedWire work separately on making its system available 24*7 for FedWire funds transfers as well as NSS while FedNow works on implementing its system.

b) Modifying the settlement option as indicated earlier and move to net debit cap based risk management and multiple settlements in a day. (can do 4 to begin with the current FedWire infrastructure and as and when volume increases and FedWire is ready for 24*7, this could be increased to every hour). (India's UPI with over 1.15 billion transactions a month settle 4 times in day. India' IMPS – with over 200 million transactions a month also settles 4 times a day and both have net debit cap based risk management mechanisms).
c) On phase I, plan only for global identifiers and decentralized directories. Others can come later.
d) Looking for an off the shelf software solution with a lot of configuration capabilities for various parameters rather than building a new solution or doing too much customization
e) Implementing a message convertor to support ISO8583, ACH and FedWire format in the system as indicated earlier. This will allow more organisation to join early. A gradual phase out plan of these formats can be worked out in discussion with the participating banks.
f) Looking for creative architecture and solutioning for the system along with creative procurement process as explained in point 7c on pricing.
g) As part of pricing, look at some initial incentives for receiving institutions to cover their implementation expenses. A small per transaction receiving incentive for the first 3 or 4 years would allow many institutions to make a stronger business case to join the scheme as this incentive would defray their expenses.