Updates to the Principles for Financial Market Infrastructures Disclosures

for Fedwire® Funds Service and Fedwire® Securities Service

December 2022

Since the last disclosures for Fedwire Services in November 2021, significant changes are underway within the Federal Reserve Banks to consolidate and centralize governance and management of all financial products and services, including the Fedwire Funds Service and the Fedwire Securities Service. Collectively, Federal Reserve Financial Services, or FRFS, have transitioned to a common organizational and leadership structure. This move toward a new enterprise construct was approved by the Federal Reserve Banks' Conference of Presidents in November 2020 and implemented on July 1, 2022, in order to advance and deliver on highly accessible, safe, and efficient payments services while staying focused on our payments-related mission and serving our customers.

This reorganization moved away from business-line product offices, such as the Wholesale Product Office (WPO), which had been in place for more than 20 years, towards a functionally organized structure led by a chief payments executive. This new collaborative operating model for financial services was approved by each Reserve Banks' board of directors in mid-2022. Additionally, FRFS Enterprise governance principles were developed and agreed upon by the 12 Reserve Banks-- these principles provide governance and management responsibility as well as accountability to FRFS senior leadership with respect to Reserve Bank financial services.

The day-to-day development, management, and operations of the Fedwire Funds Service and the Fedwire Securities Service was formerly the responsibility of the WPO headquartered at the Federal Reserve Bank of New York (FRBNY). Beginning in July, with the dissolution of the product office structure, the Reserve Banks manage the Fedwire Services collaboratively through the new FRFS operating model under the chief payments executive. To align with this management change, oversight responsibilities of FRBNY's board of directors were assumed by the Conference of Presidents' Financial Services Policy Committee (FSPC). As previously described in the disclosures, the FSPC already performed certain duties typically reserved for a board of directors, including providing overall strategy for Reserve Bank financial services. With the transition to FRFS, FSPC's responsibilities, as documented in a revised FSPC charter, are expanded to specifically include wholesale services oversight, in particular with respect to risk management. Under this governance structure FRFS senior management will develop and implement strategic priorities for the Fedwire Services with the endorsement of, and subject to the supervision of, the FSPC. FRFS senior management will provide regular reporting to the Reserve Banks' boards of directors designed to provide the Reserve Banks with general information on the FRFS and matters that concern the broad strategy of, or that have a material impact on, the Reserve Banks with respect to the Fedwire Funds Service and Fedwire Securities Service.

A comparison of the former and new governance structure of the Fedwire Funds Service and Fedwire Securities Service is provided in the table below.

	Key Governance	
Role	**Former**	**New (beginning July 1, 2022)**
General supervision over the Reserve Banks	Board of Governors	Board of Governors
Coordination among the Reserve Banks	Conference of Presidents (COP)	COP
Establishing the strategic direction for the Fedwire Funds Service and Fedwire Securities Service	COP's Financial Services Policy Committee (FSPC)	FSPC
Conducting risk management oversight over the Fedwire Funds Service and Fedwire Securities Service	*Wholesale services*: FRB New York's board of directors *Other Product Offices*: Other designated Reserve Banks' respective board of directors	FSPC
Performance and management of the Fedwire Funds Service and Fedwire Securities Service	*Wholesale services*: FRB New York's president *Other financial services:* Other designated Reserve Bank presidents	Chief Payments Executive

In 2023, the disclosures will be comprehensively reviewed. In the meantime, the current disclosures (dated November 2021) can be found at www.frbservices.org. Any questions should be sent via email to WPO.Inquiries@ny.frb.org.

Fedwire® Funds Service Disclosure

Responding FMI:	Fedwire Funds Service
Jurisdiction in which the FMI operates:	United States of America
Authority regulating, supervising, or overseeing the FMI:	Board of Governors of the Federal Reserve System
Date of this disclosure:	November 29, 2021

This disclosure can also be found at FRBservices.org.
For further information, please e-mail WPO.Inquiries@ny.frb.org.

Table of Contents

I. Executive Summary

In April 2012, the Committee on Payments and Market Infrastructures (CPMI), then known as the Committee on Payments and Settlement Systems (CPSS),[1] and the Technical Committee of the International Organization of Securities Commissions (IOSCO) published the *Principles for Financial Market Infrastructures* (PFMI) to establish a uniform set of international risk-management standards applicable to all systemically important financial market infrastructures (FMIs).[2] The stated public policy objectives of the PFMI include promoting financial stability, reducing systemic risk posed by FMIs to domestic and global financial systems, and encouraging FMI transparency to participants. CPSS and IOSCO then published in December 2012 *Principles for Financial Market Infrastructures: Disclosure Framework and Assessment Methodology* to assist FMIs in their application of the PFMI and to facilitate consistent disclosure of information by FMIs.[3] This disclosure for the Fedwire Funds Service, a real-time gross settlement (RTGS) system owned and operated by the Federal Reserve Banks of the Federal Reserve System (Reserve Banks), follows the disclosure framework set forth in that report.

The Board of Governors of the Federal Reserve System (Board of Governors) incorporated principles 1 through 24 of the PFMI into part I of the Federal Reserve Policy on Payment System Risk (the PSR policy).[4] As stated in the PSR policy, the Board of Governors requires the Reserve Banks' Fedwire Funds Service to meet or exceed the risk-management standards set forth in part I of the PSR policy, consistent with the guidance in the PFMI on central bank-operated systems and with the requirements in the Monetary Control Act.[5]

The PFMI recognize that FMIs operated by central banks might need to tailor the application of certain principles in light of their own governance requirements and policy mandates.[6] Furthermore, in its incorporation of principles 1 through 24 of the PFMI through the PSR policy, the Board of Governors also recognized that certain principles might require flexibility in the way

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[1] Effective September 1, 2014, CPSS changed its name to CPMI.

[2] Committee on Payment and Settlement Systems & Technical Committee of the International Organization of Securities Commissions, *Principles for Financial Market Infrastructures* (Apr. 2012), *available at* http://www.bis.org/cpmi/publ/d101a.pdf. FMIs include central securities depositories (CSDs), securities settlement systems (SSSs), central counterparties (CCPs), payment systems, and trade repositories (TRs).

[3] Committee on Payment and Settlement Systems & Board of the International Organization of Securities Commissions, *Principles for Financial Market Infrastructures: Disclosure Framework and Assessment Methodology* (Dec. 2012), *available at* http://www.bis.org/cpmi/publ/d106.pdf.

[4] Board of Governors of the Federal Reserve System, Federal Reserve Policy on Payment System Risk (as amended effective March 19, 2021), *available at* https://www.federalreserve.gov/paymentsystems/files/psr_policy.pdf.The Board of Governors has noted that, in applying part I of the PSR policy, it would be guided by the key considerations and explanatory notes in the PFMI. *Id.*

[5] *Id.*

[6] Principles for Financial Market Infrastructures, *supra* note 2, ¶ 1.23. This was further developed and clarified in a note released by the CPMI and the board of IOSCO in August 2015. *See* Committee on Payments and Market Infrastructures & Board of the International Organization of Securities Commissions, *Application of the Principles for Financial Market Infrastructures to Central Bank FMIs* (Aug. 2015), *available at* http://www.bis.org/cpmi/publ/d130.pdf.

they are applied to the Fedwire Funds Service.[7] Instances in which this flexibility is important in applying a particular principle are identified in the disclosure below.

[7] PSR policy, *supra* note 4, n.19.

II. Summary of Major Changes Since the Last Update of the Disclosure

The Reserve Banks last published a version of this disclosure in December 2019. Since that time, the following major changes to the Fedwire Funds Service's organization, services, design, rules, markets served, or regulatory environment have occurred:

- Effective March 8, 2021, the Reserve Banks expanded the Fedwire Funds Service operating hours from 21.5 to 22 hours to support the addition of a third same-day automated clearinghouse (ACH) processing and settlement window. This change is reflected in section III. D. of this disclosure.
- In 2021, the Reserve Banks named a chief payments executive for Federal Reserve Financial Services (see section 2.3 of this disclosure). The chief payments executive will lead Federal Reserve Financial Services as well as the Reserve Banks' strategic improvement efforts for the payments system. As of the publication of these disclosures, the designation of a chief payments executive has not yet had material changes on the operating practices, controls, or governance of Fedwire Funds Service. As changes are made that substantively affect the Fedwire Funds Service, these disclosures will be updated.

III. General Background of the Fedwire Funds Service

A. General Description

The Fedwire Funds Service is a real-time gross settlement system that enables participants to make final payments using their balances held at Reserve Banks or intraday credit provided by those Reserve Banks (i.e., by using what would be considered central bank money in either case). Every Fedwire Funds Service participant must maintain a master account at a Reserve Bank.[8] As the operational arm of the central bank of the United States, the Reserve Banks play several roles in the payment and securities settlement systems of the United States, including owning and operating the Fedwire Funds Service. As an RTGS system for the United States and the U.S. dollar, the Fedwire Funds Service plays a critical role in the implementation of United States monetary policy through the settlement of domestic open-market operations and as the primary mechanism through which depository institutions transfer balances into and from their master accounts to meet reserve requirements, if applicable or to respond to changes in the rate of interest the Reserve Banks pay on reserve balances. The Fedwire Funds Service is also used for time-critical payments, such as the settlement of commercial payments, interbank liabilities, and other financial market transactions, as well as for the funding of other systemically important FMIs and payment systems.

Core Services and Functions

The Fedwire Funds Service processes and settles payment orders individually in real time throughout the operating day. Participants can send up to one penny less than $10 billion in a single transaction. Payment to the receiving participant over the Service is final and irrevocable when the amount of the payment order is credited to the receiving participant's account or when a payment order is sent to the receiving participant, whichever is earlier. Participants of the Fedwire Funds Service send payment orders to a Reserve Bank online by initiating an electronic message or offline through the telephone. Reserve Banks send payments orders to Fedwire Funds Service participants as advices of credit by electronic message or telephone. To be accepted by a Reserve Bank, payment orders must be in the proper syntax and meet the relevant security controls.

Two types of Fedwire Funds Service value transfers (i.e., bank-to-bank transfers and third-party transfers) are used to handle a variety of time-critical payments. Bank-to-bank transfers are typically used for critical prefunding, intraday funding, and end-of-day settlement transactions for other payment systems. Third-party transfers are transactions in which the originator or the beneficiary (or both) is not a Fedwire Funds Service participant. Third-party transfers are used for a range of payments, from loan closings to tax payments. Participants may also send nonvalue messages through the Service, such as requests to reverse a transfer, to draw down a line of credit, or to inquire about or provide additional information in connection with earlier transfer messages.

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[8] A master account is a record of financial rights and obligations of an account holder and the Reserve Bank maintaining the account with respect to one another, where opening, intraday, and closing balances are determined. *See* Federal Reserve Banks, Operating Circular 1, *Account Relationships*, § 2.2(e), *available at* https://www.frbservices.org/binaries/content/assets/crsocms/resources/rules-regulations/081621-operating-circular-1.pdf. Financial institutions are generally permitted to have just one master account. *Id.* § 2.3.

Subpart B of the Board of Governors' Regulation J,[9] which incorporates Article 4A of the Uniform Commercial Code (UCC), and Operating Circular 6, *Funds Transfers Through the Fedwire Funds Service*,[10] govern the use of the Service. Although Regulation J allows a Reserve Bank to reject a payment order for any reason, payment orders are generally accepted as long as security procedures are met and messages conform to the proper message format. If an institution is being monitored by the Reserve Banks' account balance monitor (for more detail, see Principle 4, *Credit risk*), the institution must also have available funds or overdraft capacity to make the transfer. An institution that has a payment order rejected is usually informed of the rejection immediately. The intended receiving institution is not made aware of the rejection.

Article 4A, as set out in Regulation J, provides a comprehensive set of rules for funds transfers over the Fedwire Funds Service, including the following areas:

- The timing and enforceability of payment orders;
- The effect of security procedures for verifying payment orders;
- Liability for erroneous payment orders (including misdescription of the intended beneficiary's name or account number);
- The timing of acceptance of payment orders;
- Rejection of payment orders;
- Cancellation and amendment of payment orders;
- The obligations of a bank in executing an accepted payment order;
- Liability of a receiving bank for erroneous or delayed execution of a payment order;
- The sender's duty to notify the receiving bank with respect to an erroneously executed payment order;
- The obligation of a sender to pay a receiving bank for an accepted payment order; and
- The obligation of a beneficiary's bank to pay the beneficiary.

Market Overview

In the United States, funds transfers can be carried out through a variety of means. They can be effected using internal or proprietary systems of correspondent banks. They can be conducted by financial messaging systems like the FIN service of the Society for Worldwide Interbank Financial Telecommunication (SWIFT). They may also be made through other types of funds-transfer systems that combine financial messaging capabilities with the ability to settle interbank obligations. In the United States, two funds-transfer systems are generally considered to fall in the category of large-value payment systems (LVPS): the Fedwire Funds Service and the CHIPS® funds-transfer system. The PFMI define an LVPS to be a "funds transfer system that typically handles large-value and high-priority payments."[11] While the Fedwire Funds Service is generally considered an LVPS, the Service can process funds transfers of any value (from $0.01 to one cent short of $10 billion) and frequently handles what are considered "retail" payments (i.e., funds transfers that are not interbank transfers). Retail payments include funds transfers sent by or to depository institution on behalf of consumers.

[9] *See* 12 CFR §§ 210.25–32.

[10] *See* Federal Reserve Banks, Operating Circular 6, *Funds Transfers Through the Fedwire Funds Service*, *available at* https://www.frbservices.org/assets/resources/rules-regulations/030821-operating-circular-6.pdf.

[11] Principles for Financial Market Infrastructures, *supra* note 2, at 177.

The Reserve Banks, through the Fedwire Funds Service, provide RTGS services to participants of the Service. Eligible participants may access the Fedwire Funds Service directly or use a service provider to manage their activity over the Service. Over 4,700 customers can initiate or receive funds transfers over the Fedwire Funds Service. As noted in table 1, in 2020, the Service processed an average daily volume of over 727,000 transactions, with a daily average value of about $3.3 trillion, and an average transfer value of about $4.57 million. Use of the Service, however, is highly concentrated among the top 10 participants in terms of volume.

CHIPS is owned and operated by The Clearing House Payments Company L.L.C. CHIPS is not exclusively a gross settlement system. Instead, CHIPS processes some payment orders individually and others using a liquidity-saving algorithm that nets certain settlement obligations bilaterally or multilaterally.[12] Settlement of payment orders is final when the CHIPS application releases payment orders from its message queue.[13] On average, the value of transactions that the Fedwire Funds Service processes each business day is approximately twice the value of transactions that CHIPS processes daily.[14]

[12] *See* The Clearing House Payments Company L.L.C., CHIPS Rules and Administrative Procedures, §§ 13(a)–(b) (Effective March 8, 2021), *available at* https://www.theclearinghouse.org/-/media/new/tch/documents/payment-systems/chips_rules_and_administrative_procedures_03-08-2021.pdf.

[13] *Id.* §§ 2(d), § 13(a)–(b).

[14] As of December 31, 2020, CHIPS had 43 participants. The Clearing House Payments Company L.L.C., Helpful Information, *available at* http://www.theclearinghouse.org/payment-systems/chips. In 2020, CHIPS processed and settled on an average business day nearly 463,000 payment orders, with an aggregate value of approximately $1.7 trillion; the average value of a payment order was $3.58 million. The Clearing House Payments Company L.L.C., CHIPS Annual Statistics from 1970 to 2020, *available at* https://www.theclearinghouse.org/-/media/new/tch/documents/payment-systems/chips-volume-and-value.pdf.

Key Statistics

The following are key 2020 volume and value statistics for the Fedwire Funds Service:

Table 1: Fedwire Funds Service Key Statistics

Fedwire Funds Service Key Statistics	
2020 Annual Data	
Transfers originated (number)	184,010,202
Value of transfers originated (millions)	$840,483,038
Average value per transfer (millions)	$4.57
Average daily volume of transfers originated (number)*	727,313
Average daily value of transfers originated (millions)*	$3,322,067

Source: https://www.frbservices.org/resources/financial-services/wires/volume-value-stats/annual-stats.html.
Note: All figures are based on the total number of value transfers originated; nonvalue messages (e.g., requests for reversals, service messages) are not included.
*Based on the number of business days in 2020.

B. General Organization of the Fedwire Funds Service

How the Reserve Banks carry out their responsibilities for providing financial services, including the Fedwire Funds Service, is largely dictated by federal law and Board of Governors' policies. By written agreement among the Reserve Banks, the Federal Reserve Bank of New York (FRBNY) is responsible for the day-to-day management of the Fedwire Funds Service, which it accomplishes through its Wholesale Product Office (WPO). As further discussed in Principle 2, *Governance*, in managing the Service, FRBNY is responsible to a number of Federal Reserve stakeholders, including FRBNY's board of directors, certain Federal Reserve System committees, and the Board of Governors in its role as supervisor of the Reserve Banks.

C. Legal and Regulatory Framework

Ownership Structure

The Federal Reserve System was created by an act of Congress in 1913 to provide the nation with a safer, stabler, and more flexible monetary and financial system and to serve as the central bank of the United States. It is composed of, among other bodies, 12 regional Reserve Banks and the Board of Governors.[15] Member banks must subscribe to stock in their regional Reserve Bank. Although each Reserve Bank is owned by its member institutions, the legal organization of the Reserve Banks includes elements of both public and private accountability.

[15] The other bodies that make up the Federal Reserve System are member banks, the Federal Open Market Committee, and three statutory advisory committees (the Federal Advisory Council, the Consumer Advisory Council, and the Thrift Institutions Advisory Council). For more detail on the Federal Reserve System, see Board of Governors of the Federal Reserve System, *The Fed Explained: What the Central Bank Does* (11th ed. 2021), *available at* https://www.federalreserve.gov/aboutthefed/the-fed-explained.htm.

Each Reserve Bank has its own board of directors, representing public and private interests, including directors appointed by the Board of Governors, as well as directors elected by member banks in that Federal Reserve district.

For more detail on the governance of the Reserve Banks, see Principle 2, *Governance*.

Legal Structure

U.S. law provides a comprehensive, well-established, and publicly disclosed legal framework for funds transfers made over the Fedwire Funds Service. The statutes, regulations, and contractual provisions that constitute the legal framework for the Fedwire Funds Service clearly define the rights and obligations of each party to Fedwire funds transfers. The legal framework provides participants a high degree of legal assurance of the settlement and finality of funds transfers made over the Fedwire Funds Service.

General Statutes and Regulations

Federal statutes and regulations promulgated pursuant to those statutes provide the essential legal framework for the Fedwire Funds Service. These statutory and regulatory authorities, in concert with contractual provisions governing the Service, provide a comprehensive set of rules and define the rights and obligations of participants and the Reserve Banks with a high degree of certainty.

Federal Reserve Act

Several sections of the Federal Reserve Act provide the legal basis for operating the Fedwire Funds Service. The act authorizes the Reserve Banks to provide specified priced services, including funds transfer and settlement services.[16] The act also permits a Reserve Bank to receive deposits from any of its member banks or other depository institutions and to receive deposits from other Reserve Banks for purposes of exchange or collection.[17]

The Federal Reserve Act further empowers the Board of Governors to promulgate regulations governing the transfer of funds among Reserve Banks and also permits the Board to require each Reserve Bank to exercise the functions of a clearinghouse for depository institutions.[18] The act also charges the Board with exercising general supervision over the Reserve Banks and authorizes the Board to make all rules and regulations necessary to enable the Board to perform effectively its duties, functions, or services as specified in the act.[19]

Under the Monetary Control Act of 1980, which amended the Federal Reserve Act, the Fedwire Funds Service is among the Reserve Bank financial services required to be priced to fully recover, over the long run, all direct and indirect costs, certain imputed costs, and a return on

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[16] *See* Federal Reserve Act § 11A (12 USC § 248a).

[17] Federal Reserve Act § 13(1) (12 USC § 342).

[18] Federal Reserve Act § 16(14) (12 USC § 248-1).

[19] Federal Reserve Act §§ 11(j) (general supervision over Reserve Banks) (12 USC § 248(j)), 11(i) (authority to promulgate rules and regulations) (12 USC § 248(i)).

equity that would have been earned if a private-sector firm provided the services.[20] In discharging its responsibilities under the Monetary Control Act, the Board of Governors, among other things, adopted a set of standards related to the Reserve Banks' priced-services activities that are designed in part to ensure fairness to private-sector providers of financial services.[21] These standards require the Reserve Banks' monetary policy, financial institution supervision, and lending functions to be handled by Reserve Bank employees that are separate from the employees that provide Reserve Bank financial services, such as the Fedwire Funds Service, to help avoid an actual or apparent conflict that might arise between the Reserve Banks' provision of financial services and one of the other functions.[22]

Regulation J

Based on the statutory authority cited above, the Board of Governors promulgated subpart B (Funds Transfers Through Fedwire) of its Regulation J.[23] Subpart B delineates the rights and responsibilities of parties to funds transfers made over the Fedwire Funds Service. As federal law, Regulation J preempts any inconsistent provisions of the laws of U.S. states and territories.

Subpart B of Regulation J adopts Article 4A of the UCC, which is set out as appendix B to subpart B.[24] In addition, an official commentary to subpart B is set out as appendix A to subpart B. The commentary constitutes an official Board interpretation of subpart B and provides background material to explain the intent of the Board in adopting particular provisions of subpart B.

Subpart B of Regulation J governs the rights and obligations of parties to a Fedwire funds transfer, including Reserve Banks sending or receiving payment orders, "senders" that send payment orders directly to a Reserve Bank, "receiving banks" that receive advices of credit directly from a Reserve Bank, and "beneficiaries" that receive payment for payment orders sent to a Reserve Bank by means of a credit to an account maintained or used at a Reserve Bank.[25]

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[20] Federal Reserve Act § 11A (12 USC § 248a). The Monetary Control Act is discussed in more detail in section 15.1.

[21] *See* Board of Governors of the Federal Reserve System, Standards Related to Priced-Service Activities of the Federal Reserve Banks, *Federal Reserve Regulatory Service* 9–1569 to –1572 (1984), *available at* http://www.federalreserve.gov/paymentsystems/pfs_standards.htm.

[22] *Id.* at 9–1569 to –1570.

[23] *See* 12 CFR §§ 210.25–210.32.

[24] Article 4A of the UCC was developed and endorsed by the National Conference of Commissioners on Uniform State Laws, which is now known as the Uniform Law Commission (ULC), in conjunction with the American Law Institute, in 1990. The ULC, formed in 1892, is a nonprofit association of legal experts from each state, the District of Columbia, the Commonwealth of Puerto Rico, and the U.S. Virgin Islands. The ULC studies the laws of the states to determine which areas of law should be uniform nationwide and promotes the principle of uniformity by drafting and proposing specific statutes in areas of law where uniformity between the states is desirable. The ULC can only propose uniform or model statutes; no uniform or model law is effective until a body with rulemaking authority, such as a state legislature or federal agency, adopts it. The Board adopted as part of Regulation J the version of Article 4A endorsed by the ULC. Because Article 4A also has been adopted by the 50 states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands largely in its uniform form, there does not tend to be a conflict between the law governing Fedwire transfers and those governing other funds transfers. The U.S. territory of Guam has not adopted Article 4A.

[25] Refer to subpart B of Regulation J for the definition of the terms in quotation marks.

Regulation J also applies to other parties to funds transfers that might be carried out, in whole or in part, through the Fedwire Funds Service if those parties were given notice that the Fedwire Funds Service might be used to complete the transfers.

Under subpart B of Regulation J, by maintaining or using an account with a Reserve Bank, a sending bank authorizes its Reserve Bank to obtain payment for the sender's payment order by debiting the amount of the payment order from the sender's Reserve Bank account. In addition, a bank that receives an advice of credit from a Reserve Bank authorizes that Reserve Bank to pay the bank by crediting the amount of the advice of credit to the bank's account at that Reserve Bank.

Governing Agreements

Subpart B of Regulation J directs each Reserve Bank to issue an operating circular consistent with subpart B that governs the details of its funds-transfer operations. Operating Circular 6 has been issued in identical form by all Reserve Banks. It is a contract between a Reserve Bank and each Fedwire Funds Service participant that holds a master account on that Reserve Bank's books. Like Regulation J, Operating Circular 6 supersedes inconsistent provisions of Article 4A.[26]

Operating Circular 1, *Account Relationships*, governs master accounts. Each Fedwire Funds Service participant is required to have a master account. Operating Circular 1 states that every master account is subject to Federal Reserve regulations and policies, including, specifically, the PSR policy.[27]

Other Applicable Laws

Insolvency Law

U.S. depository institutions and U.S. branches and agencies of foreign banks are subject to the liquidation provisions of applicable federal, state, or territorial banking laws. The liquidation provisions of U.S. banking laws do not contain a zero-hour rule that would have the effect of voiding a settled funds transfer made over the Fedwire Funds Service involving an insolvent participant. Under U.S. banking law, payment from a sender to a receiver over the Fedwire Funds Service would not be affected by the subsequent insolvency of a participant unless a court finds the payment void after the fact as a fraudulent transfer or unlawful preference or due to other inequitable conduct. Such determinations, however, would be unrelated to the finality of a funds transfer made through the Fedwire Funds Service or of settlement for payment orders related to that funds transfer. Absent inequitable conduct on the part of a receiving bank, the receiving bank executing the payment order should not be implicated by such determinations, which only affect the discharge of the obligations as between the originator and the beneficiary.

Laws of Non-U.S. Jurisdictions

Disputes over a Fedwire funds transfer involving direct Fedwire Funds Service participants are governed by U.S. law. While it is possible that a foreign court could decline to apply U.S. law, that outcome is unlikely given that Fedwire funds transfers are made on the books of the

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[26] *See* 12 CFR § 210.25(b)(1); UCC § 4A-107 (as incorporated into 12 CFR pt. 210, app. B).

[27] Part II of the PSR policy, *supra* note 4, governs Reserve Bank intraday credit.

Reserve Banks in the United States, nearly all direct Fedwire Funds Service participants are U.S.-chartered or -licensed entities, and all agreements with participants are governed by U.S. law.[28] In case of insolvency, U.S. jurisdictions employ a territorial or "separate entity" liquidation scheme, in which a foreign bank's U.S. offices are liquidated in a proceeding under U.S. law separate from the liquidation of the foreign bank in its home country. It is unnecessary to analyze whether the home-country laws of a foreign-incorporated participant recognize netting arrangements in an insolvency context because the Fedwire Funds Service, as an RTGS system, is not a netting system.

Miscellaneous

Other U.S. statutes and regulations can affect Fedwire funds transfers. These include, for example, Office of Foreign Assets Control regulations relating to economic sanctions, the Expedited Funds Availability Act relating to the availability of electronic funds transfers deposited in transaction accounts, the Electronic Fund Transfer Act relating to certain consumer electronic funds transfers, the Bank Secrecy Act relating to anti-money–laundering and record-keeping requirements, and the USA PATRIOT Act relating to the expansion of law enforcement investigatory tools to counter terrorism.

Supervisory and Oversight Framework

The Federal Reserve Act charges the Board of Governors with exercising general supervision over the Reserve Banks, including with respect to the operation of the Fedwire Funds Service, and authorizes the Board of Governors to adopt rules and regulations necessary to enable the Board of Governors to perform effectively its duties, functions, or services as specified in the act.[29] The Board of Governors has publicly recognized the critical role the Fedwire Funds Service plays in the financial system and has implemented a supervisory framework for the Fedwire Funds Service that includes requirements that are comparable to, or exceed, those placed on similar private-sector FMIs.[30] The Board of Governors exercises this oversight in three ways—application of risk-management standards; an examination process; and review of

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[28] Except in limited circumstances, foreign banking organizations are only permitted to access the Fedwire Funds Service through branches, agencies, or affiliates established in the United States. The Reserve Banks permit participants to maintain electronic access to the Fedwire Funds Service from outside the United States in certain circumstances (typically involving the use of an overseas-based service provider, which is often an affiliate or, in the case of U.S. branches or agencies of foreign banks, the parent bank in the home country). These foreign electronic-access arrangements are governed by U.S. law by agreement, and they do not affect the applicability of U.S. law to Fedwire funds transfers because each participant's account remains in the United States and the Reserve Banks continue to send and receive payment orders to and from participants in the United States.

Similarly, foreign central banks, foreign monetary authorities, and international organizations that are Fedwire Funds Service participants are not U.S.-chartered or -licensed entities, but each such foreign participant that is a direct Fedwire Funds Service participant has agreed that U.S. law governs its relationship with the Reserve Banks. In addition, with respect to Service participants that are international organizations, the United States either is a participating member of those organizations or has another special-purpose relationship with them by agreement or by law.

[29] Federal Reserve Act §§ 11(j) (general supervision over Reserve Banks) (12 USC § 248(j)), 11(i) (authority to promulgate rules and regulations) (12 USC § 248(i)).

[30] Board of Governors of the Federal Reserve System, Policy on Payment System Risk, 79 Fed. Reg. 67326, 67332 (Nov. 13, 2014).

the Fedwire Funds Service's key strategic initiatives, price and service terms, and proposed material changes to the Service.

Part I of the PSR policy, which incorporates the risk-management and transparency standards in the PFMI, applies to both Reserve Bank and certain private-sector systems.[31] The risk-management and transparency standards in the PSR policy are consistent with those in Regulation HH, which apply to payment, clearing, and settlement systems (also known as financial market utilities) designated as systemically important by the Financial Stability Oversight Council and for which the Board of Governors has standard-setting authority under title VIII of the Dodd-Frank Act.[32] The Board of Governors expects the Fedwire Funds Service to meet or exceed the applicable standards set forth in part I of the PSR policy.[33] In addition, the Board of Governors expects the Reserve Banks to regularly update this disclosure following changes to the Fedwire Funds Service or the environment in which it operates that would significantly affect the accuracy of the statements in this disclosure.[34] At a minimum, the Board has stated that such disclosures should be updated every two years.[35]

The Board of Governors conducts examinations of the Reserve Banks' Fedwire Funds Service, and it monitors the Service's operations and initiatives through reports, discussions with Reserve Bank management, and its liaison roles on various Reserve Bank committees. The rigor of the Board of Governors' Fedwire Funds Service examination process is comparable to, or exceeds, that of the process used by Federal Reserve supervisors for designated financial market utilities.

In reviewing proposed material changes to the Fedwire Funds Service rules, procedures, and operations, the Board of Governors also holds the Reserve Banks to procedural requirements that are the same as, or higher than, the requirements for designated financial market utilities it supervises.[36] For example, the Board of Governors reviews, and has the opportunity to object to, any changes to Reserve Bank operating circulars. The Board of Governors also approves the Reserve Banks' budgets, including budgets related to the Fedwire Funds Service, and approves major Reserve Bank strategic initiatives. Furthermore, the Board of Governors approves and publishes in the Federal Register the fees the Reserve Banks charge for the Fedwire Funds Service and monitors the Reserve Banks' ongoing compliance with the cost-recovery requirements of the Monetary Control Act.

The U.S. Government Accountability Office (GAO), the investigative arm of Congress, may also examine activities of the Service.[37]

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[31] *See* PSR policy, *supra* note 4, at 7-9.

[32] *See* 12 CFR § 234.3 (Regulation HH risk-management and transparency standards).

[33] Policy on Payment System Risk, 79 Fed. Reg. at 67336.

[34] *See* PSR policy, *supra* note 4, at 11.

[35] *Id.*

[36] *Cf.* 12 CFR § 234.4.

[37] *See* 31 USC § 714.

D. System Design and Operations

Participant Access

Participants access the Fedwire Funds Service through the FedLine Direct® solution (an IP-based computer interface), the FedLine Advantage® solution (web-based access), or through the offline service described below. Participants conducting larger volumes of funds transfers typically use the FedLine Direct solution, which requires internal or third-party software to interface with the Service. Midsize or smaller participants typically access the Service though the FedLine Advantage solution, using the FedPayments® Manager—Funds application to create, send, and receive payment orders and nonvalue messages. Participants with very low transaction volume typically access the Service through the offline service.

Participants using the offline service submit transfer instructions by telephone to the Reserve Banks. Once the Reserve Bank has authenticated the requested transfer instructions, the transfer message is submitted to the Fedwire Funds Service for execution. Participants can also use the offline service to receive transfer instructions. In 2020, offline transfers accounted for less than 1 percent of all transfers originated over the Service.

Operating Hours

As noted in table 2, the Fedwire Funds Service operates 22 hours each business day beginning at 9:00 p.m. Eastern Time (ET) on the preceding calendar day and ends at 7:00 p.m. ET each business day, Monday through Friday, excluding designated holidays.[38] For example, processing on a nonholiday Monday begins at 9:00 p.m. ET on Sunday and ends at 7:00 p.m. ET on Monday.

[38] A complete time schedule and list of holidays is available on the Reserve Banks' publicly accessible financial services website at https://www.frbservices.org/resources/financial-services/wires/operating-hours.html.

Table 2: Operating Hours

As permitted under Operating Circular 6, the Reserve Banks have set cutoff times for various types of messages, including payment orders.[39]

Type Code	Type of Message	Message Description
10	Customer message	A message in which the originator and/or beneficiary fields identify parties other than depository institutions
15	Special account message	A message that can be sent only to/from prescribed accounts maintained at the Federal Reserve Bank of New York (generally, accounts for foreign central banks and international organizations)
16	Bank message	A message in which the only parties to the funds transfer identified in the message are depository institutions

Online Messages	Eastern Time
Fedwire Funds Service begins processing online nonvalue messages sent using the FedPayments Manager application through the FedLine Advantage Solution	8:35 p.m. ET on the preceding calendar day
Fedwire Funds Service begins processing (1) online payment orders and (2) online nonvalue messages sent through the FedLine Direct Solution	9:00 p.m. ET on the preceding calendar day
Cutoff time by which online type code 15 messages must be received	5:00 p.m. ET
Cutoff time by which online type code 10 messages must be received	6:45 p.m. ET
Cutoff time by which online type code 16 messages must be received	7:00 p.m. ET
Closing of the Fedwire Funds Service for online messages	7:00 p.m. ET

[39] The definition of a "payment order" is in subpart B of Regulation J.

Offline Messages	Eastern Time
Fedwire Funds Service begins processing offline messages	9:00 a.m. ET
Cutoff time for processing offline type code 15 messages	4:30 p.m. ET
Cutoff time for processing offline type code 10 messages	6:15 p.m. ET
Cutoff time for processing offline type code 16 messages	6:30 p.m. ET
Closing of the Fedwire Funds Service for offline messages	6:30 p.m. ET

At the request of a Fedwire Funds Service participant, the Reserve Banks may extend Service cutoff times or operating hours to accommodate a significant operating problem at a bank or major dealer if the extension is deemed necessary, in the Reserve Banks' view, to prevent a significant market disruption (i.e., the dollar value of delayed transfers exceeds $3 billion). For an extension to be granted, the requesting participant must make the request at least 15 minutes before the cutoff time. Extensions may also occur if there is a failure of Reserve Bank or Fedwire Funds Service network equipment. The Reserve Banks retain the discretion to shorten or extend a cutoff time or a funds-transfer business day to facilitate special market needs.

Availability

In 2020, the Fedwire Funds Service was available 99.990 percent of operating hours for all customers, which met the availability target of 99.985 percent of operating hours.

Fedwire Funds Service Transfer Flow

From a legal standpoint, a Fedwire Funds Service sender initiates the Fedwire Funds Service portion of a funds transfer by sending a payment order to the Reserve Bank holding its master account through one of the Service's access solutions.[40] This payment order will instruct that Reserve Bank as a receiving bank to pay or cause another bank to pay the beneficiary identified in the payment order. Under Regulation J, that Reserve Bank is also authorized to debit the sender's master account for the amount of the payment order. As a legal matter, in executing the sender's payment order, the executing Reserve Bank either credits the master account of the participant identified as the Fedwire Funds Service receiver for the amount of the payment

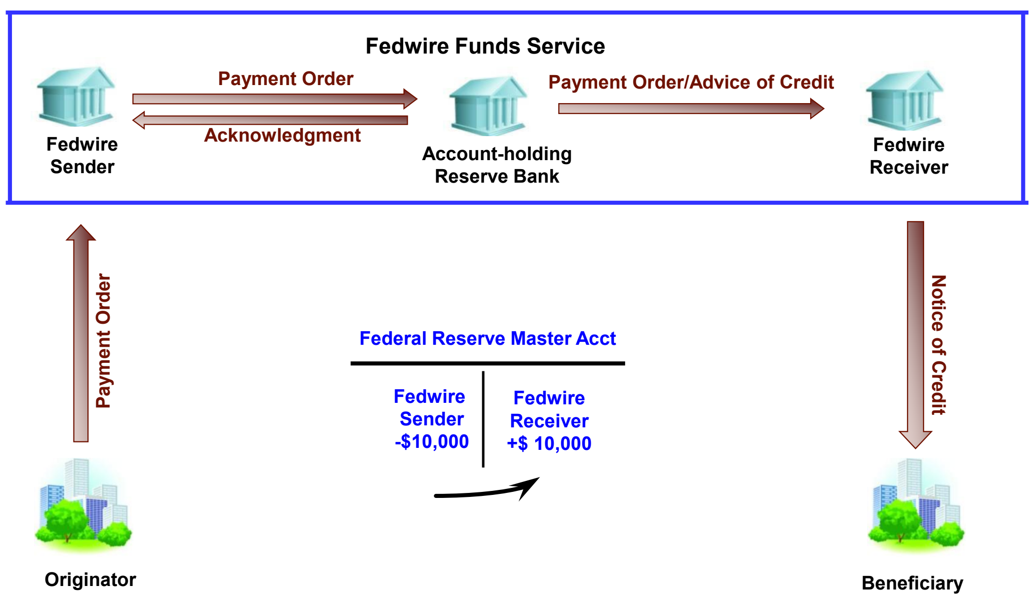
[40] Under Regulation J and Article 4A, a "funds transfer" is a series of transactions that begins with the issuance of a payment order by the originator and ends when a beneficiary's bank accepts a payment order for the benefit of the beneficiary of the originator's payment order. UCC § 4A-104(a). Accordingly, portions of a funds transfer may occur over a funds-transfer system other than the Fedwire Funds Service even though one portion of the funds transfer is sent through the Service. This disclosure does not address those portions of the funds transfer that are carried out outside the Fedwire Funds Service.

order and delivers an advice of credit or, in a case in which the receiver holds an account at another Reserve Bank, will cause that other Reserve Bank to do so.

From an operational standpoint, many of the actions that the Reserve Banks perform as sending or receiving banks in a funds transfer are accomplished by the Fedwire Funds Service as a centralized application developed, managed, and operated by FRBNY on behalf of all 12 Reserve Banks. For example, the Fedwire Funds Service processes debits and credits to the master accounts of the senders and receivers over the Service in real time, and the Fedwire Funds Service delivers advices of credit to receivers and acknowledgments to senders in real time. Moreover, the Fedwire Funds Service performs edits to validate the eligibility of the sender and the receiver and to ensure the message is in the proper syntax.

The following diagram illustrates an example of a funds transfer a portion of which is sent through the Fedwire Funds Service. The blue box shows the payment orders that are sent and received to and from the Reserve Banks. Settlement of the Fedwire Funds Service portion of the funds transfer is illustrated by the simple ledger in the center of the diagram. In the example, the Fedwire Funds Service sender is sending $10,000 on behalf of its customer (i.e., the originator) to the Fedwire Funds Service receiver for further credit to its customer (i.e., the beneficiary), and the sender and receiver have master accounts at the same Reserve Bank.

Even though the Fedwire Funds Service only processes a portion of a funds transfer, the message format for the Fedwire Funds Service contains fields that senders use to provide full details of the funds transfer to the Fedwire Funds Service receiver and other parties to the funds transfer.



IV. Principle-by-Principle Summary Narrative Disclosure

Principle 1: Legal basis
An FMI should have a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions.

1.1 The legal basis should provide a high degree of certainty for each material aspect of an FMI's activities in all relevant jurisdictions.

The Fedwire Funds Service is subject to a comprehensive U.S. legal framework that provides a basis for all material aspects of the Service. Several sections of the Federal Reserve Act, as well as subpart B of Regulation J and the Reserve Banks' operating circulars, provide the legal basis for the Reserve Banks to operate the Service and the rights and obligations of parties to a Fedwire funds transfer. The United States is the only relevant jurisdiction for assessing the legal basis of the material aspects of the Reserve Banks' activities in operating the Service because nearly all direct Service participants are U.S.-chartered or -licensed entities, and all agreements with participants are governed by U.S. law.

Subpart B of Regulation J, including its incorporation of Article 4A, provides a comprehensive set of rules for all material aspects of the Fedwire Funds Service, including the following areas:

- the timing and enforceability of payment orders;
- the effect of security procedures for verifying payment orders;
- liability for erroneous payment orders (including misdescription of the intended beneficiary's name or account number);
- timing of acceptance of payment orders;
- rejection of payment orders;
- cancellation and amendment of payment orders;
- obligations of a bank in executing an accepted payment order;
- liability of a receiving bank for erroneous or delayed execution of a payment order;
- the sender's duty to notify the receiving bank with respect to an erroneously executed payment order;
- the obligation of a sender to pay a receiving bank for an accepted payment order;
- the authorization for a Reserve Bank to debit a sender's Reserve Bank master account to obtain payment for an accepted payment order;
- settlement finality; and
- the obligation of a beneficiary's bank to pay the beneficiary.

1.2 An FMI should have rules, procedures, and contracts that are clear, understandable, and consistent with relevant laws and regulations.

The Reserve Banks and the Board of Governors take a number of steps that help ensure the rules, procedures, and contracts relating to the Fedwire Funds Service are clear, understandable, and consistent with relevant laws and regulations.

The Reserve Banks' operating circulars, which are contracts between a Reserve Bank and an institution that is located within that Reserve Bank's Federal Reserve district, are drafted by Reserve Bank legal counsel. As a matter of practice, each Reserve Bank issues its own operating circulars identical in form to those issued by the other Reserve Banks. This ensures consistent terms for the financial services the Reserve Banks provide nationwide. All proposed operating circulars and all amendments to existing operating circulars are subject to review by the Board of Governors and the 12 Reserve Banks, including by their respective general counsels.[41] Through this process, each of the Reserve Banks and the Board of Governors in its capacity as a supervisor of the Reserve Banks help to ensure that the operating circulars remain clear, understandable, and consistent with U.S. law, including subpart B of Regulation J. Moreover, to provide transparency with respect to the terms governing Reserve Bank services, the Reserve Banks publish all operating circulars on the Reserve Banks' publicly accessible financial services website, FRBservices.org.

Subpart B of Regulation J is published in the U.S. Code of Federal Regulations; Regulation J in its current form was promulgated subject to the Administrative Procedure Act's public notice and comment requirements, and any amendments to Regulation J are subject to those same requirements. Moreover, subpart B to Regulation J includes commentary that constitutes an official Board interpretation of subpart B. The Board of Governors also publishes the PSR policy, which governs the availability of intraday Reserve Bank credit to Reserve Bank customers, including Fedwire Funds Service participants, in the Federal Register and invites public comment. The PSR policy is accompanied by a public guide that is designed to assist Reserve Bank customers in complying with the policy. Both subpart B to Regulation J and the PSR policy may also be found on the Board of Governors' website.

1.3 An FMI should be able to articulate the legal basis for its activities to relevant authorities, participants, and, where relevant, participants' customers, in a clear and understandable way.

As described in section III under *Legal and Regulatory Framework*, the Reserve Banks are authorized to operate the Fedwire Funds Service under the Federal Reserve Act, and the Board of Governors promulgated subpart B to Regulation J specifically to provide the legal framework governing the rights and obligations of parties to a funds transfer made through the Service.

The Federal Reserve Act, Regulation J, and Operating Circular 6, which form the legal basis for operating the Fedwire Funds Service, are all publicly available for review by any party to a funds transfer sent through the Service.

1.4 An FMI should have rules, procedures, and contracts that are enforceable in all relevant jurisdictions. There should be a high degree of certainty that actions taken by the FMI under such rules and procedures will not be voided, reversed, or subject to stays.

The rules, procedures, and contracts that govern the Fedwire Funds Service are enforceable under U.S. law. The United States, as described in section 1.1, is the only relevant jurisdiction.

U.S. depository institutions and U.S. branches and agencies of foreign banks are subject to the liquidation provisions of applicable federal, state, or territorial banking laws. In the context of the insolvency of a Fedwire Funds Service participant, under U.S. banking laws, as described in section III above, the actions taken by the Reserve Banks in operating the Service under their rules, procedures, and contracts will not be voided or reversed. Because the Fedwire Funds

[41] All the Reserve Banks must approve any proposed operating circular or any amendment to an existing one. The Board of Governors, in its supervisory capacity, is given the opportunity to object to any proposed operating circular or amendment.

Service is an RTGS system, the Reserve Banks have not created rules that apply differently if a participant fails. Rather, the Reserve Banks may be exposed to credit risk if a sending participant fails because payment by a Reserve Bank to a receiving participant is final at the earlier of the credit to the receiving participant's master account or when the advice of credit is sent to the receiving participant. *See* Principle 13, *Participant-default rules and procedures*.

1.5 An FMI conducting business in multiple jurisdictions should identify and mitigate the risks arising from any potential conflict of laws across jurisdictions.

The Reserve Banks provide the Fedwire Funds Service only within the United States.[42] As noted above, subpart B of Regulation J provides a comprehensive set of rules for all material aspects of the Fedwire Funds Service.

[42] But see footnote 28 for a discussion of certain foreign electronic access arrangements.

Principle 2: Governance
An FMI should have governance arrangements that are clear and transparent, promote the safety and efficiency of the FMI, and support the stability of the broader financial system, other relevant public interest considerations, and the objectives of relevant stakeholders.

Because the Fedwire Funds Service is a central bank–operated payment system, U.S. law and central bank policies govern the governance framework applicable to the Reserve Banks' operation of the Service. The PFMI recognize that central bank–operated systems might need to tailor the application of this principle in light of the central bank's own governance requirements and policy mandates. In its implementation of the PFMI through the PSR policy, the Board of Governors also recognized that this principle might require flexibility in the way it is applied to the Fedwire Funds Service.

2.1 An FMI should have objectives that place a high priority on the safety and efficiency of the FMI and explicitly support financial stability and other relevant public interest considerations.

As noted in the Board of Governors' policy *The Federal Reserve in the Payments System*, the role of the Federal Reserve in providing financial services, including the Fedwire Funds Service, is to promote the integrity and efficiency of the payments mechanism, to ensure the provision of payment services to all depository institutions on an equitable basis, and to do so in an atmosphere of competitive fairness.[43] FRBNY, which is responsible for the day-to-day management of the Fedwire Funds Service on behalf of all 12 Reserve Banks, develops, manages, and operates the Service consistent with these principles, including setting annual objectives in support of these principles. As outlined in the *Federal Reserve System Guidelines for the Provision of Financial Services*, the Reserve Banks are expected to (i) maintain an operational presence in the provision of financial services where that presence, as a result of cost advantages, would contribute to economic efficiency or where other public-interest considerations might dictate; (ii) be prepared to remove themselves from the provision of those services that the private sector can supply more efficiently, unless there are overriding public-interest reasons for the Reserve Banks to continue offering such services; (iii) maintain the flexibility to change existing services or to offer new ones to meet specialized or evolving needs of financial institutions and the public; (iv) ascertain the needs of financial institutions and the public in order to enhance their service offerings; (v) encourage innovation across financial services; and (vi) provide full information to financial institutions about the nature and scope of the services they offer.[44]

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[43] *See* Board of Governors of the Federal Reserve System, The Federal Reserve in the Payments System, *Federal Reserve Regulatory Service* 9–1550 to –1561 (issued 1984; revised 1990 & 2001), *available at* http://www.federalreserve.gov/paymentsystems/pfs_frpaysys.htm.

[44] *See* Board of Governors of the Federal Reserve System, Federal Reserve System Guidelines for the Provision of Financial Services, Federal Reserve Regulatory Service 9–1573 (June 1981), *available at* https://www.federalreserve.gov/paymentsystems/pfs_guidelines.htm. Moreover, under another Board of Governors' policy, when the Reserve Banks are considering introducing a new service or major service enhancements, all of the following criteria must be met: (i) the Federal Reserve must expect to achieve full recovery of costs in operating the service in question over the long run; (ii) the Federal Reserve must expect that its providing the service will yield benefits to the public, such as promoting the efficiency and integrity of the payments system; and (iii) the service should "be one that other providers alone cannot be expected to provide with reasonable effectiveness, scope, and equity." *See* The Federal Reserve in the Payments System, *supra* note 43, at 9–1557.

Reserve Bank operations, including the management and operation of the Fedwire Funds Service, are subject to the general supervision of the Board of Governors, providing accountability to both the Board and the general public.

2.2 An FMI should have documented governance arrangements that provide clear and direct lines of responsibility and accountability. These arrangements should be disclosed to owners, relevant authorities, participants, and, at a more general level, the public.

The governance of Reserve Bank financial services, including the Fedwire Funds Service, is largely dictated by federal law and Board of Governors' policies, both of which are available to the public.[45] Under the Federal Reserve Act, Regulation J, and Reserve Bank operating circulars, each Reserve Bank offers the Service to legally eligible customers. By written agreement among the Reserve Banks, FRBNY is responsible for the day-to-day management, operation, support, and ongoing development of the Fedwire Funds Service. FRBNY established the WPO as the area within FRBNY primarily charged with carrying out FRBNY's responsibilities under the agreement with the other Reserve Banks. The WPO is consequently responsible for the daily operational management of the Fedwire Funds Service, subject to the supervision and control of FRBNY's board of directors.

Because the Fedwire Funds Service is operated by FRBNY on behalf of all Reserve Banks, when considering governance of the Service, it is necessary to consider both FRBNY's governance structure as the Reserve Bank charged with managing day-to-day Fedwire Funds Service operations and the governance structure supporting decision-making among the Reserve Banks for those aspects of the Service for which each Reserve Bank retains discretion.

FRBNY Governance

The Federal Reserve Act, FRBNY's bylaws, and the charters of the standing committees of FRBNY's board of directors, as well as the charters of FRBNY's executive committee and that committee's subcommittees, document the responsibility and accountability of the FRBNY employees responsible for the Fedwire Funds Service. Under section 4(6) of the Federal Reserve Act and FRBNY's bylaws, FRBNY's board of directors is responsible for the supervision and control of FRBNY's activities, including the activities performed in support of the Fedwire Funds Service. FRBNY's president, as chief executive officer under section 4(4)(*fifth*) of the Federal Reserve Act, is likewise responsible for these activities.[46] FRBNY's president may delegate authority to other FRBNY officers.

With respect to the Fedwire Funds Service, FRBNY's president has delegated responsibility for the management of the Service by appointing a product director and a product manager. The product director of the WPO is a member of FRBNY's executive committee and reports to FRBNY's first vice president. The product manager is responsible for the day-to-day operations

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[45] Reserve Bank financial services include cash services, check services, automated clearinghouse services, funds-transfer services, securities transfer services, multilateral settlement services, and related support functions, including financial management, customer support, electronic access, and marketing/sales.

[46] Reserve Bank powers include those specifically granted in the Federal Reserve Act and such incidental powers "as shall be necessary to carry on the business of banking within the limitations prescribed by [the Federal Reserve Act]." Federal Reserve Act § 4(4) (12 USC § 341).

of the Fedwire Funds Service. While the product director and product manager are responsible for Fedwire Funds Service operations, as discussed in more detail in section 2.5, FRBNY's board of directors and president have established several separate control functions within FRBNY to provide an independent view of FRBNY's risk profile, including risks related to the Fedwire Funds Service. Ultimately, it is the responsibility of FRBNY's first vice president and president, with escalation to FRBNY's board of directors where appropriate, to resolve disagreements between the WPO's senior management and these control functions.

Governance Among the Reserve Banks

Although each Reserve Bank is a separate legal entity, the Reserve Banks often agree to conduct operations on a centralized or consolidated basis and to implement consistent policies and services. The centralized structure of the Fedwire Funds Service was approved by each Reserve Bank's board of directors and formally established through a written agreement among the 12 Reserve Banks. The agreement sets out the responsibility and accountability of FRBNY as the Reserve Bank selected to manage the Fedwire Funds Service and identifies the areas in which each of the Reserve Banks, as owners of the Service, retains responsibility and accountability.

Where needed, ultimate coordination and cooperation among Reserve Banks with respect to financial services is principally organized under their Conference of Presidents (COP). Among other things, the COP, which is made up of the president of each Reserve Bank, meets to discuss issues of strategic interest to the Federal Reserve System and to discuss matters of common concern to the Reserve Banks. Each Reserve Bank president is empowered to make decisions, without special authorization from his or her Reserve Bank's board of directors, concerning matters that fall within the general business of that Reserve Bank. To the extent that the COP is considering matters that concern the broad strategy of a Reserve Bank, as well as those of material interest to a Reserve Bank, that Reserve Bank's president must act in a manner that is consistent with the approvals and broad strategies adopted by the board of directors of his or her Reserve Bank.

The COP may establish committees to coordinate Reserve Bank activities. Two such committees, the Financial Services Policy Committee (FSPC) and the Information Technology Oversight Committee (ITOC), play important roles in Reserve Bank financial services. The FSPC provides overall direction of Reserve Bank financial services and related support functions, as well as providing leadership for the evolving U.S. payments system. ITOC sets the strategic direction and policy for Reserve Bank information technology (IT), approves national IT standards and security policies, and oversees the provision of national IT services to Reserve Banks. The Conference of First Vice Presidents (CFVP), which is made up of the first vice president of each Reserve Bank, also plays a role and is concerned primarily with Reserve Bank operations and support functions. Like the COP, the FSPC, ITOC, and the CFVP may delegate certain responsibilities to individuals whom they designate and/or to committees they establish.

Under the governance structure approved by FRBNY's board of directors, FRBNY's president and the WPO's senior management develop strategic priorities for the Service and then seek endorsement of those priorities through the COP and those individuals or committees to whom/which it has delegated approval or endorsement authority. FRBNY's implementation of the strategy is subject to the supervision and control of FRBNY's board of directors, including the application of FRBNY's risk-management framework.

Other Reserve Bank Service Providers

By agreement with FRBNY, certain Reserve Banks provide operational support to FRBNY for the Fedwire Funds Service. These Reserve Banks, as separate legal entities, remain accountable to their own senior management and boards of directors; under the agreements with FRBNY, however, these Reserve Banks are required to, among other things, meet operating and performance standards (e.g., standards for reporting risk events). Under the agreements with these Reserve Banks (known as wholesale operations sites), each such Reserve Bank is accountable to FRBNY for the services that it has agreed to provide. FRBNY remains responsible to the other 11 Reserve Banks for the provision of the entire Service, however—even for those aspects performed by other Reserve Banks. FRBNY's board of directors is responsible for overseeing the WPO's management of the relationship that FRBNY has with these Reserve Bank service providers.

In addition to the wholesale operations sites, FRBNY relies on the electronic access, customer support, and sales and marketing services provided by the Federal Reserve Bank of Chicago's Customer Relations and Support Office (CRSO) in connection with FRBNY's management and operation of the Fedwire Funds Service. FRBNY also relies on the Federal Reserve Bank of Richmond for certain consolidated IT services known as "National IT." Among other things, National IT is responsible for running the technology infrastructure used by the Fedwire Funds Service. FRBNY is responsible for defining the business requirements and specifications of the wholesale services, and managing/overseeing the development of software to run wholesale services including the Fedwire Funds Service. The CRSO and National IT are responsible for providing customer access solutions and hosting environments for wholesale services respectively.

FRBNY's board of directors oversees the services provided by the CRSO and National IT by means of quarterly reports that are designed to provide FRBNY with information that assists it in managing its responsibility for the WPO and other matters that concern the broad strategy of, or that have a material impact on, FRBNY. Other oversight tools include quarterly reports assessing the CRSO's and National IT's performance against predefined measures and annual performance evaluations. Senior management of these Reserve Banks meet with FRBNY's board of directors upon request.

In addition to FRBNY's oversight of these two critical service providers, the governance of the services provided by the Federal Reserve Bank of Chicago through the CRSO and by the Federal Reserve Bank of Richmond through National IT is similar to the governance of FRBNY's operation of the WPO. Both the Chicago and Richmond Reserve Banks operate under the supervision and control of a board of directors, are subject to general supervision of the Board of Governors, have agreements in place with all the Reserve Banks to provide the services, and are responsive to Reserve Bank conferences and committees such as the COP, the FSPC, ITOC, and the CFVP.

Board of Governors

Under the Federal Reserve Act, the Board of Governors has supervisory authority over the Reserve Banks, including the Reserve Banks' provision of payment and settlement services. With respect to the wholesale services, including the Fedwire Funds Service, the Board of Governors has publicly recognized the critical role these services play in the financial system and has implemented a supervisory framework for the wholesale services that is comparable to, or exceeds, the requirements placed on similar private-sector payment and settlement arrangements.

To carry out its authority, the Board of Governors has established two committees to provide direction on payment and settlement system issues. The Committee on Federal Reserve Bank Affairs is charged with the Board's general supervision of Reserve Bank operations, budgets, and strategic plans. As a result, the Committee on Federal Reserve Bank Affairs oversees the Reserve Banks' provision and pricing of financial services. The Payments System Policy Advisory Committee advises the Board of Governors on policy and strategic matters involving domestic and international payment and settlement issues, including issues related to risk management.

In addition to these two committees, Board of Governors' staff, through the division of Reserve Bank Operations and Payment Systems, provides support to the Board of Governors in exercising its general supervision of Reserve Bank financial services through examinations, analyzing payment and settlement issues, and developing payment and settlement policies and regulations. The Board of Governors has delegated authority to the division's director to approve certain types of proposals and expenditures. Other proposals and expenditures may be approved by the Reserve Banks under their own authority.[47]

2.3 The roles and responsibilities of an FMI's board of directors (or equivalent) should be clearly specified, and there should be documented procedures for its functioning, including procedures to identify, address, and manage member conflicts of interest. The board should review both its overall performance and the performance of its individual board members regularly.

As noted above, under the Federal Reserve's governance structure, there are two bodies with roles and responsibilities that are akin to the roles and responsibilities that a standalone FMI's board of directors would have—FRBNY's board of directors and the COP. Furthermore, the latter body has chosen to delegate many of its responsibilities to one of its committees. Additionally, the COP also elected in 2021 to designate a chief payments executive; however, as of the publication of this disclosure, responsibilities have not yet been formally delegated to that role.

FRBNY's Board of Directors

The Federal Reserve Act states that each Reserve Bank's board of directors generally is responsible for supervision and control of that Reserve Bank.[48] The board of directors is required to perform the duties usually appertaining to the office of directors of banking organizations, including exercising (directly or by officers or agents) "all powers specifically granted … by [the Federal Reserve Act] and such incidental powers as shall be necessary to carry on the business of banking within the limitations prescribed by [the Federal Reserve Act]."[49] Powers specifically granted by the Federal Reserve Act include the authority, with the

[47] *See* Board of Governors of the Federal Reserve System, Supervision and Oversight of Financial Market Infrastructures, Reserve Bank Systems, *available at* http://www.federalreserve.gov/paymentsystems/over_rbsystems.htm.

[48] Federal Reserve Act § 4(6) (12 USC § 301).

[49] Federal Reserve Act § 4(4) (12 USC § 341).

approval of the Board of Governors, to appoint a president, who is the Reserve Bank's chief executive officer, and to prescribe bylaws, which cannot be inconsistent with law, regulating the manner in which the general business of the Reserve Bank may be conducted. The Federal Reserve Act, combined with the Reserve Bank bylaws, provides that, subject to the supervision and control of the board of directors, the president as chief executive officer of the Reserve Bank shall have general charge and control of the business and affairs of that Reserve Bank.

The roles of Reserve Bank directors generally fall in three principal areas: overseeing the management of the Reserve Bank, participating in the formulation of national monetary and credit policies, and acting as a "link" between the government and the private sector.

FRBNY's bylaws and the charters for FRBNY's three standing board committees—the nominating and corporate governance committee, the audit and risk committee, and the management and budget committee—further define roles and responsibilities of FRBNY's board of directors and those granted to each of its standing committees, as well as limitations on those roles and responsibilities.[50] Among other things, the nominating and corporate governance committee is responsible for director conduct, including managing director conflicts of interest and investment restrictions, ensuring the audit and risk committee is informed of risk events related to director-related policies, and annually assessing the performance of the board, board committees, and individual board members.[51] The management and budget committee's responsibilities include oversight and guidance on the performance of FRBNY's strategic and material activities, including those of the WPO. The audit and risk committee is responsible, among other things, for FRBNY's risk-management framework and oversight of the WPO's activities.

As discussed in more detail in section 2.4, the Federal Reserve Act dictates who appoints different classes of FRBNY directors and whose interests those directors represent. While the requirements in the Federal Reserve Act could result in potential conflicts of interest, especially with respect to class A directors (i.e., directors who represent member banks), several factors minimize that risk. First, all Reserve Bank directors are subject to policies adopted by the Board of Governors that address director conduct and serve to mitigate conflicts of interest.[52] In addition, under FRBNY's bylaws, the authority of FRBNY's board of directors does not extend to activities that fall within the statutory authority of the Board of Governors or any other federal agency. This constraint minimizes the risk of an actual or perceived conflict of interest arising from the Reserve Banks' separate roles as operator of the Fedwire Funds Service and as supervisor (acting under delegated authority of the Board of Governors) of other FMIs because it places supervisory and regulatory matters outside the purview of FRBNY's board of

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[50] FRBNY's bylaws are *available at* http://www.newyorkfed.org/aboutthefed/ny_bylaws.html. Under FRBNY's bylaws, the board of directors may also act by executive committee in the absence of a quorum. The charters of FRBNY's standing board committees are *available at* http://www.newyorkfed.org/aboutthefed/nominate.html, http://www.newyorkfed.org/aboutthefed/audit.html, and http://www.newyorkfed.org /aboutthefed/management.html.

[51] Class A directors, who are elected by member banks to represent their interests, may not constitute a majority of the membership of either the audit and risk committee or the nominating and corporate governance committee.

[52] These policies are *available at* http://www.federalreserve.gov/aboutthefed/directors/policy-governing-directors.htm.

directors.[53] Reserve Bank directors are also subject to the same criminal conflict-of-interest statute that applies to federal government employees, as well as to officers and employees of the Reserve Banks. That statute prohibits a Reserve Bank director from participating personally and substantially in any Reserve Bank matter that, to the director's knowledge, would have a direct and predictable effect on the director's financial interest, broadly defined.[54] At the time they join the board, directors are required to undergo ethics training and to certify that they comply with FRBNY's restrictions on interests in financial institutions. Thereafter, they must recertify their compliance every year. If an actual or potential director conflict arises, directors are obligated to recuse themselves from the matter.[55]

COP and FSPC

The COP established the FSPC to provide overall direction to financial services and related support functions for the Reserve Banks, as well as to provide leadership for the evolving U.S payments system. The COP's expectations for the FSPC are outlined in its charter. They include (i) approving a multi-year strategic plan for Reserve Bank financial services; (ii) approving an annual update to the strategic plan for Reserve Bank financial services and related support functions; (iii) providing input on product office strategic plans and endorsing material changes to existing strategic plans; and (iv) approving, overseeing, and giving guidance with respect to major Reserve Bank projects.[56] The FSPC is composed of Reserve Bank presidents and a Reserve Bank first vice president. In addition, a senior management representative of the Board of Governors, the Federal Reserve's chief information officer (an officer of the Federal Reserve Bank of Richmond), and the product directors of the various product and support offices that manage or support Reserve Bank financial services (including the product director of the WPO) serve as liaison members of the FSPC.

All Reserve Bank officers and employees, including members of the COP and the FSPC, are subject to a code of conduct, and they are subject to the same federal conflict-of-interest statute discussed above that applies to Reserve Bank directors (and federal government employees).[57] Reserve Bank officers and employees are generally prohibited from owning or controlling

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[53] Constraints on the authority of certain directors also serve to limit actual or perceived conflicts. For example, under FRBNY's bylaws, class A directors, which represent member banks, and class B directors affiliated with thrift holding companies may not participate in personnel or budget decisions related to FRBNY's supervision group.

[54] 18 USC § 208. Participation in a particular matter may include making a decision or recommendation, providing advice, or taking part in an investigation.

[55] FRBNY's general counsel or corporate secretary attends all meetings and, where appropriate (e.g., in advance of discussion of a particular FRBNY vendor), counsels the directors with respect to their obligation to recuse themselves from matters that might create actual or potential conflicts of interest. The board of directors receives an agenda before each meeting that the directors and FRBNY's corporate secretary use to identify matters that raise conflicts concerns.

[56] As noted in section 2.2 above, to the extent the COP is considering matters that concern the broad strategy of a Reserve Bank, as well as those of material interest to a Reserve Bank, that Reserve Bank's president must act in a manner that is consistent with the approvals and broad strategies adopted by the board of directors of his or her Reserve Bank.

[57] FRBNY's code of conduct is *available at* https://www.newyorkfed.org/medialibrary/media/aboutthefed/ob43.pdf. FRBNY's code of conduct is generally consistent with the codes of conduct of the other Reserve Banks, but FRBNY's code of conduct is tailored to address activities unique to FRBNY. The federal conflict-of-interest statute is codified at 18 USC § 208.

investments in depository institutions, affiliates of depository institutions, thrift holding companies whose thrifts constitute a significant portion of their overall assets, and investment funds that have a stated policy of concentrating their investments in the financial services sector.[58] To avoid the appearance of conflicts of interest, Reserve Bank officers and employees are also generally prohibited from accepting gifts from a supervised institution or anyone that does business or seeks to do business with the Reserve Banks.

The ethics officer and senior management of each Reserve Bank are responsible for ensuring that their officers and employees comply with that Reserve Bank's code of conduct and the ethics laws. This is primarily done through annual training and financial disclosures, as well as through ethics hotlines.

2.4 The board should contain suitable members with the appropriate skills and incentives to fulfil its multiple roles. This typically requires the inclusion of nonexecutive board members.

All Reserve Bank directors are nonexecutive directors. Both the process for selecting directors and the criteria for serving as directors are mandated by section 4 of the Federal Reserve Act. Like each Reserve Bank's board of directors, FRBNY's board of directors has nine members, who are divided into three equal classes—designated A, B, and C. Class A and class B directors are elected by FRBNY's shareholders.[59] Class C directors are appointed by the Board of Governors. Each year, one class C director is designated by the Board of Governors to be chair of FRBNY's board of directors and a second class C director is designated deputy chair.

Under the Federal Reserve Act, FRBNY's class A directors represent the member banks in FRBNY's district. Typically, class A directors are officers or directors of member banks or their holding companies. Class B and class C directors are required by the Federal Reserve Act to represent the public "with due but not exclusive consideration to the interests of agriculture, commerce, industry, services, labor and consumers."[60] The intent of Congress in devising such a system was to ensure that a diversity of viewpoints and backgrounds is represented on each Reserve Bank's board of directors.

As a general matter, FRBNY's directors are expected to contribute to the Federal Reserve's understanding of local economic conditions and the effect of those conditions on the nation's economy as a whole.[61] Under the charter of the audit and risk committee, directors that serve on the committee, which is responsible for FRBNY's risk-management framework, must meet certain independence and experience requirements, including possessing an adequate familiarity with and knowledge of effective risk-management practices, and at least one member

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[58] Investment restrictions applicable to FRBNY employees are outlined generally in section 5.3 of its code of conduct. Employees with monetary policy or supervisory responsibilities are subject to additional restrictions. From time to time, FRBNY and the other Reserve Banks may adopt further restrictions as necessary or appropriate to avoid actual or potential conflicts of interest.

[59] Under the Federal Reserve Act, Reserve Bank shareholders are member banks. All national banks and those state banks that have successfully applied to become members must subscribe to stock in the Reserve Bank in their Federal Reserve district.

[60] Federal Reserve Act § 4(11) (codified at 12 USC § 302).

[61] Information about the eligibility, qualifications, and rotations of Reserve Bank directors generally is *available at* http://www.federalreserve.gov/generalinfo/listdirectors/PDF/eligibility-qualifications-rotation.pdf.

of the committee must be a “financial expert” as defined by the Securities and Exchange Commission. Further, in accordance with the CPMI-IOSCO Guidance on Cyber Resilience for Financial Market Infrastructures, the composition of the audit and risk committee reflects a mix of skills, experience, and technical knowledge to understand and manage the risks posed by technology and cyber threats.[62]

The makeup of the COP and the FSPC is discussed above in sections 2.2 and 2.3.

2.5 The roles and responsibilities of management should be clearly specified. An FMI’s management should have the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the operation and risk management of the FMI.

Responsibilities of FRBNY’s Management

As noted, FRBNY’s president serves as chief executive officer and is responsible for all of FRBNY’s activities. The product director of the WPO, together with the product manager, is charged with managing the operation of the Fedwire Funds Service, and the scope of that FRBNY function is outlined in the service agreement FRBNY has with the other Reserve Banks. The heads of FRBNY’s control functions, including the chief risk officer, the general counsel, and the chief compliance officer, along with FRBNY’s general auditor, are charged with providing an independent assessment of risk across all of FRBNY’s activities, and they are each empowered to develop frameworks for addressing these risks and escalating risk concerns to FRBNY’s first vice president, president, and board of directors.

Expertise and Performance

FRBNY requires that each of its executive officers have significant core expertise and experience and that each exhibit leadership abilities in such areas as strategic thinking, inclusiveness, and staff and team development. Each FRBNY officer develops annual performance objectives in consultation with his or her direct supervisor. For the WPO’s product director and product manager, annual performance goals are also discussed with the FSPC. FRBNY officers, including all FRBNY’s executive officers, are subject to annual performance evaluations.[63] Each FRBNY officer, except the first vice president, general auditor, and general counsel, may be removed by FRBNY’s president or its board of directors. FRBNY’s president, first vice president, general auditor, and general counsel may be removed only by FRBNY’s board of directors.[64]

In addition to the internal appraisal process, the Reserve Banks annually conduct an evaluation of FRBNY’s performance under the agreement it has with the other Reserve Banks with respect to the wholesale services, including the Fedwire Funds Service; this evaluation includes an assessment of the WPO’s management and leadership. The FSPC coordinates this effort,

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[62] The CPMI-IOSCO Guidance on Cyber Resilience for Financial Market Infrastructures is *available at* https://www.bis.org/cpmi/publ/d146.pdf.

[63] Annual performance evaluations of FRBNY’s president and general auditor are performed by FRBNY’s board of directors and its audit and risk committee, respectively. Annual performance evaluations of FRBNY’s first vice president are performed by FRBNY’s president and board of directors.

[64] Note, however, that, as supervisor of the Reserve Banks, the Board of Governors also has the power to remove or suspend any officer or director of a Reserve Bank.

which includes a self-assessment by FRBNY of its performance against the previously agreed-upon business objectives, an assessment by FRBNY of its subcontractors and agents against agreed-upon performance measures, and an assessment by each of the other Reserve Banks of FRBNY's performance in terms of the agreed-upon performance measures, as well as its delivery of the wholesale services overall. All Reserve Banks receive the results of this annual assessment.

Integrity

As outlined in FRBNY's code of conduct, FRBNY believes it is indispensable to the proper functioning of, and the maintenance of public confidence in, FRBNY and the Federal Reserve System overall that every employee and officer perform his or her duties with honesty, integrity, and impartiality and without improper preferential treatment of any person.[65] Under FRBNY's code of conduct, each employee and officer has a responsibility to FRBNY and the rest of the Federal Reserve System to avoid conduct that places private gain above his or her duties to FRBNY, that gives rise to an actual or apparent conflict of interest, or that might result in a question being raised regarding the independence of the employee's or officer's judgment or ability to perform the duties of his or her position satisfactorily. Moreover, each employee is expected to conduct his or her financial affairs with integrity and honesty.

Reserve Bank employees and officers who are responsible for Reserve Bank financial services, including those in the WPO, are also subject to an information barrier imposed by the Board of Governors that restricts their access to information of the Reserve Banks' supervisory, monetary policy, and lending functions. This policy is designed to help avoid a conflict or potential conflict that might arise between the Reserve Banks' role as financial service providers and their roles as supervisors and lenders.[66]

2.6 The board should establish a clear, documented risk-management framework that includes the FMI's risk-tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision making in crises and emergencies. Governance arrangements should ensure that the risk-management and internal control functions have sufficient authority, independence, resources, and access to the board.

Pursuant to the agreement under which FRBNY manages the Fedwire Funds Service for all 12 Reserve Banks, FRBNY is required to identify and manage risks associated with the provision of wholesale services, where appropriate working with other Reserve Banks. As reflected in FRBNY's risk-management framework, risk-tolerance policy, and risk-tolerance statement, FRBNY employs a three-lines-of-defense risk-management model that emphasizes interaction and communication between the first line (business line) and second line (central risk management), with independent oversight by the third line (internal audit). FRBNY relies on these lines of defense to help it manage risk for the wholesale services, including the Fedwire Funds Service. (For more detail on the three-lines-of-defense risk-management model, see Principle 3, *Framework for the comprehensive management of risks*.)

[65] *See* section 2.3 for a further discussion of ethical rules applicable to all Reserve Bank employees and officers, including FRBNY employees and officers (i.e., the federal conflict-of-interest statute and investment restrictions).

[66] *See* Standards Related to Priced-Service Activities of the Federal Reserve Banks, *supra* note 21.

FRBNY's risk-management framework includes required assessments by business areas across FRBNY, an internal control framework designed to map controls to key risks, a reporting framework designed to capture risk events, and policies to address certain risks that are applicable to all business lines. FRBNY's risk-management framework, risk-tolerance policy, and risk-tolerance statement assign responsibilities and accountability for risk decisions. In addition, the WPO has established its own risk-tolerance statement with respect to its management of risks specific to the wholesale services, including the Fedwire Funds Service, and, as required under FRBNY's risk-management framework, the WPO's risk-tolerance statement aligns with FRBNY's risk-management framework, risk-tolerance policy, and risk-tolerance statement.[67]

The audit and risk committee of FRBNY's board of directors is responsible for assisting FRBNY's board of directors in assessing, among other things, the adequacy and effectiveness of financial reporting controls, the independent audit function, and risk-management practices for the overall institution, including those relating to the Fedwire Funds Service.[68] It is through the activities of the audit and risk committee, which receives reporting and briefings directly from FRBNY's chief risk officer, general counsel, chief compliance officer, and general auditor, as well as the WPO's product director, that the board of directors monitors FRBNY's risk-management policies and practices.[69]

Some of the audit and risk committee's responsibilities are specific to the WPO. For instance, the committee provides oversight, guidance, and feedback regarding the WPO and the WPO's compliance with the PFMI.[70] This includes helping to ensure that the design and rules of the Fedwire Funds Service and the WPO's overall strategy and major decisions affecting the Service appropriately reflect the legitimate interests of the Service's direct and indirect participants and other relevant stakeholders.[71] To fulfill its responsibilities, the committee periodically receives reports and briefings on the WPO's strategic priorities and risk management from the WPO's product director and other senior management.[72]

FRBNY's chief risk officer is a member of FRBNY's executive committee, is independent from FRBNY's business lines, and has direct access to FRBNY's board of directors without management being present. The WPO works closely with FRBNY's chief risk officer and central risk-management function to develop the WPO's risk tolerances and assess the risks associated with the Fedwire Funds Service.

FRBNY's general auditor reports directly to FRBNY's board of directors, has access to the board of directors without management being present, and may not be removed by any FRBNY officer, including the president. Under the service agreement between the Reserve Banks, FRBNY's general auditor is responsible for ensuring that there is comprehensive audit attention to the Fedwire Funds Service to help ensure that risk management and control processes

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[67] For additional information regarding the review and approval of FRBNY's risk-management framework, risk-tolerance policy, and risk-tolerance statement and WPO's risk-tolerance statement, see section 3.1.

[68] *See* Board of Directors, Federal Reserve Bank of New York, Audit and Risk Committee Charter, art. V(C), *available at* http://www.newyorkfed.org/aboutthefed/audit.html.

[69] *See id.*

[70] *See id.*

[71] *See id.*

[72] *See id.*

applicable to the Service are effective. The Board of Governors retains an external auditor to audit the Federal Reserve's consolidated financial statements, as well as the financial statements of each Reserve Bank. The external auditor also audits FRBNY's internal controls over financial reporting. To ensure independence, the external auditor may not provide any other services to FRBNY.

As noted in section 17.6, there are documented communication and incident-management protocols in place at the Federal Reserve System level to address impacts, guide decision-making, and assign responsibilities across multiple Reserve Banks or business lineswhen the Reserve Banks are faced with a severe information security incident or other disruptive event affecting the Fedwire Funds Service. The protocols incorporate incident and problem management processes established by the Reserve Banks to (1) manage the rapid deployment of skilled personnel and resources to restore normal operations as quickly as possible and (2) facilitate the review of critical incidents, determine root causes, and assist in the prevention of recurring problems.

2.7 The board should ensure that the FMI's design, rules, overall strategy, and major decisions reflect appropriately the legitimate interests of its direct and indirect participants and other relevant stakeholders. Major decisions should be clearly disclosed to relevant stakeholders and, where there is a broad market impact, the public.

The audit and risk committee of FRBNY's board of directors, in coordination with other Federal Reserve System bodies is responsible for ensuring that the design and rules of the Fedwire Funds Service and the WPO's overall strategy and major decisions affecting the Service appropriately reflect the legitimate interests of the Service's direct and indirect participants and other relevant stakeholders.[73]

Under section 11A of the Federal Reserve Act, the Board of Governors was charged with establishing pricing principles and fee schedules based on those principles for Reserve Bank-provided financial services. After issuing those principles,[74] the Board of Governors further elaborated on them in guidelines, two of which require the Federal Reserve to seek input from and provide information to external stakeholders. Specifically, the two guidelines read as follows:

> [(1)] In the provision of financial services, the [Reserve Banks and the Board of Governors] will ascertain the needs of depository institutions and the public so that the Federal Reserve can enhance its ability to offer useful, cost-effective, and complete packages of financial services to its customers, while recognizing the statutory requirement that revenues must cover costs.
>
> [(2)] The Reserve Banks will undertake efforts to provide depository institutions with full information about the nature and scope of financial services offered, including the prices,

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[73] *See* Board of Directors, Federal Reserve Bank of New York, Audit and Risk Committee Charter, art. V(C), *available at* http://www.newyorkfed.org/aboutthefed/audit.html.

[74] *See* Board of Governors of the Federal Reserve System, Principles for Pricing of Federal Reserve Bank Services, *Federal Reserve Regulatory Service* 9–1566 to –1568 (1980), *available at* http://www.federalreserve.gov/paymentsystems/pfs_principles.htm.

benefits, and operating requirements of those services. The character of these efforts should be consistent with the System's responsibility to serve the public interest.[75]

The Board of Governors' role in establishing pricing principles and approving fees for Reserve Bank financial services and in carrying out certain other responsibilities is a unique aspect of the structure of the Federal Reserve System because the Board of Governors takes actions that might be undertaken by a board of directors of a standalone private-sector FMI. For example, while the Reserve Banks publish all operating circulars and fee schedules, as well as any changes to them, on the Reserve Banks' publicly accessible financial services website, by policy the Board of Governors determines whether to seek public comment on significant changes to Reserve Bank financial services and approves fees for Reserve Bank financial services, including the Fedwire Funds Service, with a detailed disclosure explaining how those fees were determined.

New Services, Service Modifications, and Rule Changes

Requests for Public Comment on Reserve Bank Financial Services Changes

The Board of Governors has adopted a policy of seeking public comment when changes in Reserve Bank fees and service arrangements are proposed that would have significant longer-run effects on the nation's payments system.[76] One of the committees of the Board of Governors, the Committee on Federal Reserve Bank Affairs mentioned in section 2.2, has issued guidelines that Board of Governors staff and the committee could use "as input to their assessment of whether a proposal related to Federal Reserve priced services should be subject to public comment before adoption."[77] These guidelines, which are not to be "rigidly applied, but rather used at the Board's discretion," indicate that public comment should be requested in the following circumstances: (i) the Board of Governors proposes changes to its pricing principles; (ii) a Reserve Bank plans to enter a new priced service line or significantly expand or modify an existing service line; (iii) all Reserve Banks plan to withdraw from a current service line; (iv) Reserve Banks plan to recover less than the short-run average variable cost for a service line over an extended period; (v) a Reserve Bank's planned action in connection with a service is likely to have a direct and material adverse effect on the ability of other service providers to compete effectively in providing similar services for legal reasons (i.e., due to differing legal powers or constraints) or because the Reserve Banks have a dominant market position deriving from such legal differences; (vi) the Board of Governors proposes a significant modification to the methodology for calculating imputed costs or revenue for the priced services; or (vii) the contemplated action would, or is meant to, result in a significant long-term structural change in the nation's payments or settlement systems.[78]

[75] Federal Reserve System Guidelines for the Provision of Financial Services, *supra* note 44, at 9–1573.

[76] *See* Principles for Pricing of Federal Reserve Bank Services, *supra* note 74, at 9–1568 (principle 7).

[77] *See* Committee on Federal Reserve Bank Affairs, Board of Governors of the Federal Reserve System, Guidelines for Requesting Public Comment on a Federal Reserve Priced Service, *Federal Reserve Regulatory Service* 9–1574 (1995).

[78] *See id.*

Material Changes to Service and Service Proposals

Board of Governors' policy also dictates that the Reserve Banks seek the Board of Governors' review of any material changes to the risk profile of the Fedwire Funds Service or of any other proposals relating to the Service that the Board deems to be "nonroutine." This policy is intended to ensure that the Board of Governors holds the Reserve Banks to procedural requirements that are the same as, or higher than, the requirements for financial market utilities designated as systemically important by the Financial Stability Oversight Council and supervised by the Board of Governors. The Board of Governors imposes a similar requirement on such financial market utilities through Regulation HH.

The Board of Governors has delegated the authority to approve routine, nonmaterial service proposals to the FSPC. Given this delegation and the Reserve Banks' agreement (endorsed by the Reserve Banks' boards of directors) to work through the COP and its committees, FRBNY, acting principally through the WPO, works with the FSPC and the COP to advance strategies related to the Fedwire Funds Service. From time to time, FRBNY, through the WPO, presents proposals relating to the Service to the Payments System Policy Advisory Committee.

Changes to Rules of the Board of Governors and to Operating Circulars of the Reserve Banks

As a federal agency, the Board of Governors is subject to the public notice and comment provisions of the Administrative Procedure Act when it proposes new, or amends existing, rules or regulations, including Regulation J, which governs the Fedwire Funds Service. Generally, the Administrative Procedure Act requires that each federal agency provide notice to the public of a proposed rulemaking and an opportunity for the public to comment on the proposed rulemaking before it becomes effective. The notice of a proposed rulemaking must be published in the Federal Register. In addition, the Board of Governors may seek public comment on certain policy issues that are not necessarily rules under the Administrative Procedure Act.[79]

The process for changing Reserve Bank operating circulars is described in section 1.2.

Informal Reserve Bank Efforts

The Reserve Banks, through the WPO and the CRSO, regularly seek to improve the efficiency and effectiveness of the Fedwire Funds Service. The WPO uses external user groups to obtain information on best practices, participant business needs, demand for new features, and cost reduction. The CRSO obtains customer input through regular interactions with individual customers, as well as through the administration of periodic customer satisfaction surveys.

For more detail on how the Reserve Banks solicit feedback on the Service, see Principle 21, *Efficiency and effectiveness.*

Customer Advisory Group

As described in more detail in section 21.1, an advisory group chaired by FRBNY provides a mechanism for ongoing communication and collaboration between the WPO, other Reserve

[79] As an example, the Board of Governors seeks public comment on its PSR policy.

Bank business functions, and representatives of major Fedwire Funds Service participants. The WPO uses this advisory group to improve its understanding of Fedwire Funds Service customer business needs. The WPO works closely with the advisory group to obtain feedback on potential changes and enhancements to the Fedwire Funds Service, to identify and consider the likely implications of changes to the Service, to suggest and structure additional analysis or market research needed to evaluate potential changes to the Service, and to participate in the review of high-level specifications for changes and enhancements selected for implementation.

Other

The Reserve Banks periodically seek input on specific issues through interviews with customers, customer surveys, focus groups, or meetings with industry trade groups across a range of issues and financial services, including the Fedwire Funds Service. With respect more specifically to the Fedwire Funds Service, consolidated business and technical customer support units provide support and problem resolution related to specific service issues, such as answering questions about how to use features of the Service, solving problems, reconciling transactions, and establishing and testing electronic access connections. The WPO uses information from these areas to improve the Fedwire Funds Service.

Principle 3: Framework for the comprehensive management of risks
An FMI should have a sound risk-management framework for comprehensively managing legal, credit, liquidity, operational, and other risks.

3.1 An FMI should have risk-management policies, procedures, and systems that enable it to identify, measure, monitor, and manage the range of risks that arise in or are borne by the FMI. Risk-management frameworks should be subject to periodic review.

The Fedwire Funds Service faces a range of risks as an FMI. These risks include operational, strategic, compliance, financial statement reporting, reputational, and legal risks.[80] The WPO uses FRBNY's risk-management framework, risk-tolerance policy, and risk-tolerance statement, along with the WPO's own risk-tolerance statement and associated policies, procedures, and systems, as the basis for its comprehensive management of these risks with respect to the Service. Under the WPO's risk-tolerance statement, the WPO developed a review process to regularly evaluate business-specific risks against acceptable risk tolerances. As required by the WPO's risk-tolerance statement, the WPO reports and escalates risks to the audit and risk committee of FRBNY's board of directors and incorporates remediation plans into the WPO's strategic planning process. Further, the WPO adheres to the supporting policies, procedures, and systems established for FRBNY as a whole in the WPO's identification, measurement, monitoring, and management of these risks.

FRBNY's risk-management framework, risk-tolerance policy, and risk-tolerance statement and the WPO's own risk-tolerance statement are routinely reviewed. Every two years, the risk-management framework is reviewed by FRBNY's executive committee and approved by FRBNY's chief risk officer and first vice president as well as by the audit and risk committee of FRBNY's board of directors. FRBNY's central risk-management function reviews FRBNY's risk-tolerance policy at least annually, updating the policy as necessary. FRBNY's executive committee is required under the policy to update and approve FRBNY's risk-tolerance statement every year. FRBNY's risk-tolerance statement is then presented to the audit and risk committee for its approval. FRBNY's president and the audit and risk committee approve the WPO's risk-tolerance statement.

As reflected in FRBNY's risk-management framework, risk-tolerance policy, and risk-tolerance statement, FRBNY employs a three-lines-of-defense risk-management model in its risk oversight of the Fedwire Funds Service that emphasizes interaction and communication between the first line (business line) and second line (central risk management), with independent oversight by the third line (internal audit).

- The first line of defense consists of the WPO and the wholesale operations sites at other Reserve Banks that provide operational support for the Fedwire Funds Service. The WPO and the wholesale operations sites are responsible for identifying, assessing, mitigating, monitoring, and reporting risks, and for managing risk within FRBNY's and the WPO's tolerances. The WPO is ultimately responsible for

[80] Financial risk, including credit risk, is managed by each Reserve Bank in its capacity as an Administrative Reserve Bank. An Administrative Reserve Bank is the Reserve Bank in whose Federal Reserve district the Fedwire Funds Service participant is located. It generally oversees the administration of Federal Reserve credit, reserves, and risk-management policies for a financial institution's operations nationwide. For additional information on Administrative Reserve Bank responsibilities, see section 3.2 and Principle 4, *Credit risk*.

overseeing the services provided by the wholesale operations sites and for ensuring that the risk-management practices of the wholesale operations sites are aligned with FRBNY's own risk-management framework.

- The second line of defense refers to FRBNY's organizational units that provide independent risk assessment, independent risk oversight, development and maintenance of risk frameworks and risk-related policies, and support of first-line implementation of risk frameworks. One such organizational unit, the central risk-management function, independently assesses the WPO's risk management and compliance with policies and procedures. The function periodically updates FRBNY's chief risk officer and risk representatives from other FRBNY control functions and business areas on risks related to the Fedwire Funds Service. It also provides integrated risk reporting on a quarterly basis to the audit and risk committee of FRBNY's board of directors. Three other FRBNY organizational units that have notable second line-of-defense responsibilities with respect to the Service are the legal group, the technology group, and the information-security function.
- The third line of defense is FRBNY's internal audit group, which provides an independent assessment of the effectiveness of the control environment for identifying and managing risk in the wholesale services. The internal audit group conducts annual audits of the wholesale services using a risk-based approach. It also monitors the WPO's strategically important projects, current business operations, and new initiatives. The internal audit group also reports the results of their work, including recommendations to the other lines of defense, as well as directly to the audit and risk committee of FRBNY's board of directors.

3.2 An FMI should provide incentives to participants and, where relevant, their customers to manage and contain the risks they pose to the FMI.

U.S. law, the Reserve Banks, and the policies of the Board of Governors provide incentives to Fedwire Funds Service participants to manage a variety of risks they pose to the Reserve Banks in operating the Service, such as credit risk and fraud risk.

The Board of Governors' PSR policy provides a mix of incentives for Reserve Bank customers to limit the credit risk they pose to each Administrative Reserve Bank (ARB),[81] including in connection with their use of the Fedwire Funds Service. For instance, under the PSR policy, institutions with regular access to the discount window receive a zero fee for the collateralized portion of their overdrafts and are assessed a fee of fifty basis points (annual rate) for the uncollateralized portion of their overdrafts. This pricing difference provides an incentive for even healthy institutions to collateralize intraday overdrafts and limits an ARB's risk of loss from credit exposure to that institution. An ARB might also apply risk controls or take other remedial actions to manage credit risk that will affect how the customer uses Reserve Bank services, particularly if the customer is a higher-risk institution. For more detail on how the Reserve Banks manage their credit risk and on the information the Reserve Banks provide customers to manage their accounts, see Principle 4, *Credit risk.*

The Reserve Banks offer each Fedwire Funds Service participant a variety of security procedures and enforce certain security-related rules to minimize risks to the Service. These risks include cybersecurity risk and the risk of fraud (i.e., the risk that a Reserve Bank would

[81] See footnote 80 for the definition of ARB.

execute a payment order that had not been authorized by its sender). A participant chooses the particular security procedure that will be used to verify the authenticity of its payment orders in a written agreement with the Reserve Bank that holds its master account. The Reserve Banks themselves are incented to offer commercially reasonable security procedures. That is because the law shifts the risk of loss away from banks that receive payment orders (like the Reserve Banks in the case of the Fedwire Funds Service) so long as they verify the payment orders they receive in compliance with a security procedure that is commercially reasonable.[82] The risk of loss resulting from unauthorized payment orders therefore generally falls on Service participants. Consequently, they are motivated to take measures to mitigate the risk that their hardware, software, or other systems or personnel might be compromised. A participant may be able to shift the liability back to its Reserve Bank, but only if the participant proves that the unauthorized order was caused by a true interloper.[83]

Operating Circular 5, which governs electronic access to the Reserve Banks, also incents Fedwire Funds Service participants to manage and contain the risks they pose to the Service directly and through their customers by relieving the Reserve Banks of liability if participants fail to adopt or implement prescribed information security measures.[84]

The FedPayments Manager—Funds application offers participants accessing the Fedwire Funds Service through the FedLine Advantage solution a variety of processing options to help them manage how they create, update, and verify messages they send to the Fedwire Funds Service. Participants determine the appropriate settings based on their own business and risk tolerance. The Reserve Banks have also implemented a feature that allows participants to extend certain options in FedPayments Manager–Funds to payment orders they submit via the FedLine Direct solution and the offline service.

In 2021, the Reserve Banks implemented a security and resiliency assurance program to reduce the risk of fraudulent payments or other messages being sent through Reserve Bank financial services. Institutions and their service providers that use the Reserve Banks' FedLine® solutions to access any Reserve Bank financial service, including the Fedwire Funds Service, must conduct an annual self-assessment of compliance with Reserve Bank security

[82] Specifically, a receiving bank is entitled to regard a payment order as authorized, even if it was not, if the following conditions are met. First, the receiving bank and the sender of the payment order must have agreed that the authenticity of payment orders issued to the bank would be verified in accordance with a security procedure. Second, the agreed-upon security procedure must be commercially reasonable. Third, the receiving bank must prove that, in accepting the payment order, it did so in good faith and in compliance with the agreed-upon security procedure and any written agreement or instruction from the customer restricting the acceptance of payment orders. The liability for an unauthorized payment order is thereby shifted to the sender of the order. *See* UCC § 4A-202 (applicable to the Reserve Banks in the context of the Fedwire Funds Service by virtue of Regulation J).

[83] The burden of proof is high: the participant must prove that the unauthorized order was not caused, directly or indirectly, by anyone it had entrusted with duties to act for it with respect to payment orders or the security procedure (such as an employee or a service provider); by anyone who obtained access to the participant's facilities for transmitting payment orders; or by anyone who obtained information, such as access devices or computer software, that facilitated breach of the security procedure, even if the participant was not at fault. *See* UCC § 4A-203(b).

[84] This limitation is subject to applicable law. *See* Federal Reserve Banks, Operating Circular 5, *Electronic Access*, app. A §§ 4.1, 4.2, *available at* https://www.frbservices.org/binaries/content/assets/crsocms/resources/rules-regulations/063021-operating-circular-5.pdf.

requirements. FedLine users must submit a written attestation to the Reserve Banks upon completion of their assessments. While the self-assessment may be calibrated to the risks institutions face, the Reserve Banks may require the assessment to be conducted or reviewed by an independent third party, an internal audit function, or an internal compliance function. Institutions are required to remediate any areas of noncompliance with Reserve Bank security requirements.

For more detail on the measures the Reserve Banks require Service participants to take with respect to cybersecurity and how those measures help address the risk posed not only by those participants but also by their customers, see Principle 19, *Tiered participation arrangements*.

3.3 An FMI should regularly review the material risks it bears from and poses to other entities (such as other FMIs, settlement banks, liquidity providers, and service providers) as a result of interdependencies and develop appropriate risk-management tools to address these risks.

The WPO regularly evaluates the material risks the Service bears from and poses to other entities and has procedures for minimizing risks that could impact the availability of the Service in such scenarios. Among these risks, the Fedwire Funds Service faces operational risk from its multiple Reserve Bank and third-party service providers, including utilities such as electricity and telecommunications network suppliers. As a result, the WPO closely monitors service provision and actively manages these relationships. The Reserve Banks also recognize the systemic importance of the Fedwire Funds Service and the material risk it poses to other entities, including other FMIs. As a result, the Reserve Banks expend significant effort to ensure that the availability of the Service remains high and that its resiliency program remains robust and is tested regularly.

3.4 An FMI should identify scenarios that may potentially prevent it from being able to provide its critical operations and services as a going concern and assess the effectiveness of a full range of options for recovery or orderly wind-down. An FMI should prepare appropriate plans for its recovery or orderly wind-down based on the results of that assessment. Where applicable, an FMI should also provide relevant authorities with the information needed for purposes of resolution planning.

As the Board of Governors noted when it revised the PSR policy to incorporate the risk-management and transparency standards in the PFMI, the Fedwire Funds Service does not "face the risk that a business shock would cause the service to wind down in a disorderly manner and disrupt the stability of the financial system."[85] Accordingly, the Board of Governors does not require the Service to develop recovery or orderly wind-down plans under this principle.[86] This is consistent with *Application of the Principles for Financial Market Infrastructures to Central Bank FMIs* issued in August 2015 regarding central bank-operated FMIs, which noted that a central bank's ability to "ensure continuity of operations of the FMI as necessary in extreme financial circumstances means that the requirements to prepare recovery and orderly wind-down plans do not apply."[87] The August 2015 guidance also states that

[85] Policy on Payment System Risk, 79 Fed. Reg. at 67329.

[86] *Id.*

[87] *See* Application of the Principles for Financial Market Infrastructures to Central Bank FMIs, *supra* note 6, at 1.

requirements to support resolution planning or intervention by a resolution authority in the operation or ownership of FMIs do not apply in the case of central bank–operated FMIs, like the Fedwire Funds Service, because intervention by a resolution authority is not relevant for such FMIs.[88]

[88] *See id.*

Principle 4: Credit risk
An FMI should effectively measure, monitor, and manage its credit exposure to participants and those arising from its payment, clearing, and settlement processes. An FMI should maintain sufficient financial resources to cover its credit exposure to each participant fully with a high degree of confidence. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two largest participants and their affiliates that would potentially cause the largest aggregate credit exposures to the CCP in extreme but plausible market conditions. All other CCPs should maintain, at a minimum, total financial resources sufficient to cover the default of the one participant and its affiliates that would potentially cause the largest aggregate credit exposures to the CCP in extreme but plausible market conditions.

As a central bank–operated RTGS system, neither the Fedwire Funds Service itself nor its nondefaulting participants are affected by participant defaults. As an ARB, each Reserve Bank manages credit risk posed by its customers across all Reserve Bank financial services, not just the Fedwire Funds Service. By policy of the Board of Governors, credit risk management is handled by Reserve Bank employees that are separate from the employees that provide Reserve Bank financial services, such as the Fedwire Funds Service.[89] The discussion below, therefore, considers how the Reserve Banks address credit exposure to Fedwire Funds Service participants through their credit risk-management functions (rather than the Fedwire Funds Service).

4.1 An FMI should establish a robust framework to manage its credit exposures to its participants and the credit risks arising from its payment, clearing, and settlement processes. Credit exposure may arise from current exposures, potential future exposures, or both.

Part II of the PSR policy governs the provision of intraday credit (or daylight overdrafts) in master accounts at the Reserve Banks and serves as the framework by which the Reserve Banks manage their credit exposures to account holders. The PSR policy recognizes that the Reserve Banks have an important role in providing intraday credit to foster the smooth functioning of the payment system. At the same time, the policy seeks to control the risks assumed by the Reserve Banks in providing that intraday credit. In considering an institution's request for daylight overdraft capacity, Reserve Banks evaluate the institution's financial, market, and supervisory information. Under the policy, the Reserve Banks may supply temporary, intraday credit to financially healthy depository institutions. The Reserve Banks control their exposures through several methods, including by motivating institutions to collateralize daylight overdrafts voluntarily (by not charging a fee for collateralized daylight overdrafts), by setting limits on daylight overdrafts in institutions' master accounts, and by requiring collateral in certain situations.

To ensure compliance with the policy, the Reserve Banks monitor daylight credit usage for each account holder generally on an *ex post* basis given different posting rules across Reserve Bank services. However, specifically for transfers through the Fedwire Funds Service, the Reserve Banks apply real-time monitoring controls to the balances of nearly all institutions as a standard

[89] *See* Standards Related to Priced-Service Activities of the Federal Reserve Banks, *supra* note 21, at 9–1570.

risk mitigant such that the account holder tries to send a Fedwire funds transfer without having sufficient funds or overdraft capacity in its master account, the transaction would reject, thereby averting an overdraft or limiting the account-holding Reserve Bank's overdraft exposure to a predefined level.[90] In addition, for certain other Reserve Bank services, the Reserve Banks may choose to apply real-time monitoring controls under other circumstances, for instance, if a Reserve Bank believes an institution poses excessive risk (e.g., if an account holder's financial condition is deteriorating). Further, Reserve Banks may take other prudential actions to manage credit risk, including requiring institutions to post collateral.

4.2 An FMI should identify sources of credit risk, routinely measure and monitor credit exposures, and use appropriate risk-management tools to control these risks.

Reserve Banks initially assess credit risk of each account holder through their account-setup process. Institutions' eligibility for master accounts and financial services is governed by federal law and Operating Circular 1. At the time an institution applies for a master account or financial services, the account-holding Reserve Bank reviews the applicant's eligibility, initiates or updates its assessment of counterparty credit risk, assigns a net debit cap, and may apply risk controls to the account, if it deems it necessary.[91] If the institution is in weak financial condition, the Reserve Bank will impose a zero cap. Once a master account is opened, the Reserve Bank reviews the credit risk the account holder poses to it at least quarterly to ensure appropriate risk controls are applied to the account. If necessary, the Reserve Bank will implement or adjust risk controls on the account at the time of those reviews.

Reserve Banks routinely measure and monitor credit exposures posed by their account holders. For those account holders that are subject to real-time monitoring controls, such as those deemed to pose greater risk, Reserve Banks monitor and limit credit exposure throughout the business day. Credit exposure to account holders that are not subject to real-time controls is measured on a next-day basis. With few exceptions, Reserve Banks consider all cap breaches to be violations of the PSR policy and counsel account holders as outlined by the PSR policy.[92]

Reserve Banks use a range of risk-management tools to control credit risk. For lower-risk account holders, limits for intraday credit are regularly reviewed by the account holder's ARB.[93]

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[90] The participant could reinitiate the Fedwire funds transfer once it funds its master account.

[91] Under the PSR policy, each institution that maintains a master account at a Reserve Bank is assigned or may establish a net debit cap, which limits the amount of intraday Reserve Bank credit that the institution may use during the Fedwire Funds Service funds-transfer business day. Generally speaking, the net debit cap is the maximum amount of daylight overdrafts that an institution is permitted to incur in its master account at any point in the day.

[92] A cap breach occurs whenever an end-of-minute daylight overdraft exceeds an institution's net debit cap. In response to liquidity concerns during the COVID-19 pandemic, from April 2020 through March 2021, the Board of Governors increased the availability of Reserve Bank intraday credit by temporarily suspending net debit caps and waiving all daylight overdraft fees (regardless of whether the overdrafts were collateralized) for lower-risk account holders. During the same period, the Board of Governors also made it easier for higher-risk account holders to request collateralized intraday credit. *See* Board of Governors of the Federal Reserve System, 85 Fed. Reg. 23448 (Apr. 28, 2020) and 85 Fed. Reg. 63114 (Oct. 6, 2020).

[93] As stated in footnote 80, the ARB generally oversees the administration of Federal Reserve credit, reserves, and risk-management policies for a financial institution's operations nationwide. In general, a

Account holders eligible for regular discount window access pay a fee of 50 basis points (on an annualized basis) for intraday credit but pay no fee for intraday credit secured by collateral. Account holders without regular access to the discount window pay a higher, penalty fee for intraday credit (regardless of whether its collateralized) because they are not supposed to incur daylight overdrafts. Higher-risk account holders are assigned a zero net debit cap and may face additional controls, including collateral requirements and the rejection or delay of certain transactions when the balances in their accounts are insufficient. Furthermore, under Operating Circular 1, an ARB may also require an account holder to maintain adequate balances with a Reserve Bank in an amount determined by the ARB.[94]

An account holder is not entitled to incur an overnight overdraft in its master account, even if it is eligible to borrow from the discount window,[95] and is subject to a penalty fee for any overdrafts that extend beyond the close of the Fedwire Funds Service's funds-transfer business day.

Under Reserve Bank operating circulars, collateral pledged by a customer to a Reserve Bank secures the payment of all obligations that customer owes to any Reserve Bank.[96] If an account holder does not meet its obligations, whether because it fails or otherwise, the Reserve Bank to which the collateral is pledged could liquidate or otherwise dispose of the collateral to satisfy the outstanding obligations.

4.3 A payment system or SSS should cover its current and, where they exist, potential future exposures to each participant fully with a high degree of confidence using collateral and other equivalent financial resources (see Principle 5 on collateral). In the case of a DNS payment system or DNS SSS in which there is no settlement guarantee but where its participants face credit exposures arising from its payment, clearing, and settlement processes, such an FMI should maintain, at a minimum, sufficient resources to cover the exposures of the two participants and their affiliates that would create the largest aggregate credit exposure in the system.

As described in section 4.2 above, Reserve Banks may, among other steps, require the pledging of collateral by higher-risk account holders or prohibit institutions from using Reserve Bank intraday credit in order to protect themselves from the risk of loss. They may also require account holders to maintain certain balances.

For lower-risk account holders, the PSR policy provides incentives for institutions to pledge collateral voluntarily to secure daylight overdrafts, thereby helping to mitigate the credit exposures to the Reserve Banks from daylight overdrafts. Institutions that secure their use of intraday credit with collateral are not charged for these daylight overdrafts, while institutions that incur uncollateralized daylight overdrafts are charged a fee.

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financial institution has only one master account, so the account-holding Reserve Bank and the ARB are the same.

[94] *See* Operating Circular 1, *supra* note 8, ¶ 2.11.

[95] An institution eligible to borrow from the discount window could request a loan from its Reserve Bank to cover a daylight overdraft so it does not become an overnight overdraft. If the loan request is granted and the amount of the loan is sufficient to cover the overdraft, then no overnight overdraft would occur.

[96] *See* Operating Circular 1, *supra* note 8,. ¶ 5.3; Federal Reserve Banks, Operating Circular 10, *Lending*, § 6, *available at* https://www.frbservices.org/assets/resources/rules-regulations/071613-operating-circular-10.pdf.

Reserve Bank losses would be absorbed by the Reserve Bank that extended the credit. As the operational arm of the central bank of the United States, Reserve Banks are not subject to capital or liquidity constraints that apply to private-sector FMIs. Therefore, it is not necessary for the Reserve Banks to hold additional resources to cover potential exposures.

4.4 A CCP should cover its current and potential future exposures to each participant fully with a high degree of confidence using margin and other prefunded financial resources (see Principle 5 on collateral and Principle 6 on margin). In addition, a CCP that is involved in activities with a more-complex risk profile, or that is systemically important in multiple jurisdictions should maintain additional financial resources to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. All other CCPs should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. In all cases, a CCP should document its supporting rationale for, and should have appropriate governance arrangements relating to, the amount of total financial resources it maintains.

This consideration is not applicable because the Fedwire Funds Service is not a CCP.

4.5 A CCP should determine the amount and regularly test the sufficiency of its total financial resources available in the event of a default or multiple defaults in extreme but plausible market conditions through rigorous stress testing. A CCP should have clear procedures to report the results of its stress tests to appropriate decision makers at the CCP and to use these results to evaluate the adequacy of and adjust its total financial resources. Stress tests should be performed daily using standard and predetermined parameters and assumptions. On at least a monthly basis, a CCP should perform a comprehensive and thorough analysis of stress testing scenarios, models, and underlying parameters and assumptions used to ensure they are appropriate for determining the CCP's required level of default protection in light of current and evolving market conditions. A CCP should perform this analysis of stress testing more frequently when the products cleared or markets served display high volatility, become less liquid, or when the size or concentration of positions held by a CCP's participants increases significantly. A full validation of a CCP's risk-management model should be performed at least annually.

This consideration is not applicable because the Fedwire Funds Service is not a CCP.

4.6 In conducting stress testing, a CCP should consider the effect of a wide range of relevant stress scenarios in terms of both defaulters' positions and possible price changes in liquidation periods. Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions.

This consideration is not applicable because the Fedwire Funds Service is not a CCP.

4.7 An FMI should establish explicit rules and procedures that address fully any credit losses it may face as a result of any individual or combined default among its participants with respect to any of their obligations to the FMI. These rules and procedures should address how potentially uncovered credit losses would be allocated, including the repayment of any funds an FMI may borrow from liquidity providers. These rules and procedures should also indicate the FMI's process to replenish any financial resources that the FMI may employ during a stress event, so that the FMI can continue to operate in a safe and sound manner.

Under Regulation J and Operating Circular 6, if a Fedwire Funds Service participant sends a payment order to a Reserve Bank and the Reserve Bank executes the payment order, the Reserve Bank's payment to the receiving Service participant is final at the earlier of the time when the Reserve Bank credits the receiving participant's master account or sends the receiving participant a corresponding advice of credit, regardless of whether the sending Service participant meets its obligation to pay the Reserve Bank for the amount of the payment order.[97] For this reason, if the sending participant's Reserve Bank permitted the participant to overdraw its master account by accepting the payment order it was sent and if the sending participant did not subsequently cover that overdraft, the Reserve Bank holding the master account could incur a loss. As discussed in sections 4.1 and 4.2, the Reserve Banks have a range of tools to help them monitor and manage credit risk. Among other things, the Reserve Banks generally have a security interest in all property of their customers in their possession or control.[98] Such collateral could be used to offset what would otherwise be a loss to the account-holding Reserve Bank.

As the operational arm of the central bank of the United States, the Reserve Banks will be able to provide liquidity to Fedwire Funds Service participants even in stress events.

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[97] For additional information on settlement finality, see Principle 8, *Settlement finality*.

[98] *See* Operating Circular 1, *supra* note 8, § 5.3.

Principle 5: Collateral
An FMI that requires collateral to manage its or its participants' credit exposure should accept collateral with low credit, liquidity, and market risks. An FMI should also set and enforce appropriately conservative haircuts and concentration limits.

Each Reserve Bank manages credit risk posed by its customers across all Reserve Bank financial services, not just the Fedwire Funds Service. By policy of the Board of Governors, collateral decisions, like credit risk management decisions, are handled by Reserve Bank employees that are separate from the employees that provide Reserve Bank financial services, such as the Fedwire Funds Service.[99] The discussion below, therefore, considers how the Reserve Banks impose collateral requirements on Fedwire Funds Service participants through their credit risk-management functions (rather than the Fedwire Funds Service). The presence or absence of collateral, the valuation of collateral, and the margins applied to collateral have no direct effect on the operations of the Fedwire Funds Service.[100] In other words, no Reserve Bank application checks whether the Fedwire Funds Service participants identified in a Fedwire funds-transfer message have pledged collateral (or what the value of that collateral is) before the Service processes that message.[101]

5.1 An FMI should generally limit the assets it (routinely) accepts as collateral to those with low credit, liquidity, and market risks.

Collateral pledged to a Reserve Bank by a Fedwire Funds Service participant must be acceptable to that Reserve Bank. The Reserve Banks accept a wide range of collateral that generally meet regulatory standards for sound asset quality; detailed criteria for accepting certain types of assets as collateral are set forth in the Reserve Banks' collateral guidelines.[102] The Reserve Banks periodically review these criteria to assess whether any changes should be made. The Reserve Banks may accept other types of collateral but do not routinely do so.

Once an institution has pledged assets as collateral, the Reserve Bank to which the assets have been pledged conducts periodic reviews of certain assets. If an asset is determined to no longer meet the Reserve Bank's eligibility requirements, that Reserve Bank will reduce the collateral value of that asset to zero and request that the institution withdraw the asset from the pledge.

[99] *See* Standards Related to Priced-Service Activities of the Federal Reserve Banks, *supra* note 21, at 9–1570.

[100] In some instances, as part of the risk controls it applies to an account holder, the ARB may require the institution to collateralize its net debit cap and may choose to monitor the institution's account in real time against the level of the net debit cap, such that Fedwire funds-transfer messages that would exceed the institution's net debit cap would be rejected.

[101] By contrast, as discussed in section 4.1, it is possible for the Reserve Banks to implement real-time monitoring of Fedwire Funds Service transactions such that funds-transfer messages could be rejected if they result in an overdraft in a sending participant's master account or would cause the sending participant to breach its net debit cap. In the absence of such monitoring, however, the Fedwire Funds Service will process such messages even if they result in an overdraft in a sending participant's master account or a breach of the participant's net debit cap.

[102] *See* Federal Reserve Banks, Federal Reserve Collateral Guidelines, *available at* https://www.frbdiscountwindow.org/pages/collateral/discount%20window%20margins%20and%20collateral%20guidelines.

5.2 An FMI should establish prudent valuation practices and develop haircuts that are regularly tested and take into account stressed market conditions.

Collateral pledged to the Reserve Banks is valued using third-party pricing or, if third-party pricing is not available, using Reserve Bank internal models; in either case, collateral is subject to haircuts. The internal models the Reserve Banks use for collateral valuation and haircutting are subject to annual validation and respecification. Haircuts are established based on the historical price volatility of each category of collateral, measured over typical liquidation periods. A detailed listing of Reserve Bank collateral haircuts is available online.[103]

Reserve Banks also have the discretion to increase the haircuts they apply to collateral as they deem appropriate for effective risk management. For instance, an additional haircut will generally be applied to collateral that is pledged by depository institutions that would not be eligible for the Reserve Banks' primary credit program under Regulation A.[104]

5.3 In order to reduce the need for procyclical adjustments, an FMI should establish stable and conservative haircuts that are calibrated to include periods of stressed market conditions, to the extent practicable and prudent.

Reserve Banks accept a wide range of assets as collateral. Most collateral consists of either securities or loans. The latter category includes commercial loans, consumer loans, and loans guaranteed by U.S. federal agencies.

In general, the Reserve Banks seek to value securities and loan collateral at a fair market value estimate. Haircuts are applied to the fair market value estimate and are designed to account for the risk characteristics of the pledged asset, as well as the volatility of the value of the pledged asset over an estimated liquidation period.

Haircuts for securities used as collateral are assigned based on asset type and duration. The size of the haircuts is based on the historical price volatility of each category, measured over typical liquidation periods.

Haircuts for loans used as collateral are assigned based on reported cash flow characteristics. The size of the haircuts is based on the historical volatility of risk-free rates and proxy credit spreads, measured over typical liquidation periods.

Haircuts are reviewed annually, updated as needed, and conservatively based on historical data over typical liquidation periods. Haircuts are not procyclical insofar as, historically, they have not been adjusted in response to short-term price volatility.

For additional information, please refer to the Reserve Banks' collateral guidelines.[105]

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[103] *See* Federal Reserve Banks, Federal Reserve Discount Window & Payment System Risk Collateral Margins Table, *available at* https://www.frbdiscountwindow.org/pages/collateral/discount%20window%20margins%20and%20collateral%20guidelines.

[104] *See* 12 CFR § 201.4(a) (availability and terms of primary credit).

[105] *See* Federal Reserve Collateral Guidelines, *supra* note 102.

5.4 An FMI should avoid concentrated holdings of certain assets where this would significantly impair the ability to liquidate such assets quickly without significant adverse price effects.

The Reserve Banks generally do not employ position size or concentration limits or require haircuts to vary by size or concentration. Reserve Banks have the ability to hold assets as long as is necessary to liquidate without having an adverse impact on markets.

5.5 An FMI that accepts cross-border collateral should mitigate the risks associated with its use and ensure that the collateral can be used in a timely manner.

Before entering into an arrangement with a foreign custodian to hold certain foreign-issued or -denominated securities pledged by depository institutions, a Reserve Bank conducts certain legal due diligence to assess, among other things, its ability to liquidate such collateral in a timely manner. Currently, the only arrangements of this type are with the central securities depositories Euroclear Bank S.A./N.V. and Clearstream Banking S.A.

These custodians screen collateral pledged by Reserve Bank customers against eligibility criteria predetermined by the Reserve Banks. The eligibility standards help to ensure the Reserve Banks accept high-quality collateral, which contributes to mitigating the risk of loss that a Reserve Bank has to its account holders. Only investment-grade securities in certain asset classes are accepted, for example. Further, securities not denominated in U.S. dollars are accepted only if they are denominated in one of a specified set of currencies.[106] The exchange rate risk of those foreign-denominated securities is mitigated by adding an additional haircut. The adequacy of that additional haircut is reevaluated each time margins are respecified and is monitored on an ongoing basis between respecifications.

To be acceptable as collateral, all securities must meet certain standards relating to credit, legal, and valuation risk.[107] Reserve Banks take steps to ensure a first-priority perfected security interest in such securities.

5.6 An FMI should use a collateral management system that is well-designed and operationally flexible.

Reserve Banks operate a collateral management system that is flexible enough to record and report on the wide range of assets Reserve Bank customers pledge as collateral. Loan and securities collateral is onboarded through each Reserve Bank into a centralized collateral management application. The collateral management system records and maintains information on deposits and withdrawals of collateral throughout the business day and provides Reserve Bank customers with real-time information about the value of the collateral they have pledged. Each Reserve Bank has the ability to transfer collateral administration activities to alternate Reserve Banks to ensure business operations can be conducted without interruption and regularly tests its ability to execute those transfers. The Reserve Banks rely on third-party vendor prices for valuation, but have alternate ways to value collateral when such prices do not exist or are not available.

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[106] Currently, the only acceptable foreign currencies are Australian dollars, British pounds, Canadian dollars, Danish kroner, euros, Japanese yen, Swedish kronor, and Swiss francs.

[107] Securities may not be obligations of the pledging institution or an affiliate of the pledging institution, or otherwise correlated with the financial condition of the pledging institution.

Principle 6: Margin

A CCP should cover its credit exposures to its participants for all products through an effective margin system that is risk-based and regularly reviewed.

This principle is not applicable to the Fedwire Funds Service.

Principle 7: Liquidity risk
An FMI should effectively measure, monitor, and manage its liquidity risk. An FMI should maintain sufficient liquid resources in all relevant currencies to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate liquidity obligation for the FMI in extreme but plausible market conditions.

Because the Fedwire Funds Service is a credit-transfer (i.e., credit push) system, to the extent that liquidity is needed for the operation of the Service, it is needed by senders in the Service. This liquidity may be provided by these senders' account-holding Reserve Banks to settle payment orders they send through the Service.[108] The use of Reserve Bank liquidity is governed by procedures and controls implemented by each participant's ARB that are separate from the operation of the Service. For more detail about Reserve Bank credit that may be used as liquidity, refer to Principle 4, *Credit risk*.

7.1 An FMI should have a robust framework to manage its liquidity risks from its participants, settlement banks, nostro agents, custodian banks, liquidity providers, and other entities.

As the operational arm of the central bank of the United States, the Reserve Banks are not subject to liquidity constraints that apply to private-sector FMIs, including when the Reserve Banks provide liquidity to Fedwire Funds Service participants. As noted in section 7.2 below, however, the Reserve Banks apply the framework outlined in part II of the PSR policy to manage the liquidity they provide to their customers, some of which are Fedwire Funds Service participants, and the credit risk those customers may pose to them. It is important to note that the Reserve Banks perform this function outside their role as operator of the Fedwire Funds Service.

7.2 An FMI should have effective operational and analytical tools to identify, measure, and monitor its settlement and funding flows on an ongoing and timely basis, including its use of intraday liquidity.

Reserve Banks have automated systems, including a range of risk controls, to monitor and manage liquidity used by customers, including Fedwire Funds Service participants, and to manage the resulting credit risk those customers pose.[109] These include tools to monitor account balances, report and price overdrafts in Reserve Bank master accounts, manage collateral posted to the Reserve Banks, and compile information for assessing the financial condition of Reserve Bank customers. As noted in section 4.1, the Reserve Banks can monitor

[108] Participants do not need access to liquidity as receivers of advices of credit over the Service.

[109] As a general matter, balances held in a Fedwire Funds Service participant's master account are available for settlement purposes throughout the Fedwire Funds Service funds-transfer business day. In addition, under part II of the PSR policy, most Service participants have access to intraday credit provided by the Reserve Banks that hold their accounts. This converts the liquidity risk otherwise borne by participating institutions into credit risk borne by the Reserve Banks. Although the intraday credit provided by the Reserve Banks is sufficient for most Service participants, the limits prescribed by the PSR policy on how much intraday credit a Reserve Bank customer may use could constrain some Service participants' payment operations. Such constraints, however, must be managed by the Service participants themselves and do not affect the functioning of the Service. For more detail on how the Reserve Banks manage credit risk, see Principle 4, *Credit risk*, and part II of the PSR policy, *supra* note 4.

payment activity and intraday account balances of customers in real time throughout the business day and may restrict their access to Reserve Bank intraday credit. If a Reserve Bank subjects a customer that is a Service participant to real-time monitoring, the Reserve Bank will reject a Fedwire funds transfer initiated by that participant if the amount of the funds transfer exceeds the total of the participant's available master account balance and its permitted daylight overdraft capacity, if any.[110] For more detail on the range of risk-management tools used by the Reserve Banks to control the credit risk of their customers, see Principle 4, *Credit risk*.

Moreover, the Reserve Banks provide their customers, including Fedwire Funds Service participants, with intraday and *ex post* tools to monitor and manage master account balances, net debit caps, collateral pledged to the Reserve Banks, and the use of Reserve Bank intraday credit.[111]

7.3 A payment system or SSS, including one employing a DNS mechanism, should maintain sufficient liquid resources in all relevant currencies to effect same-day settlement, and where appropriate intraday or multiday settlement, of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation in extreme but plausible market conditions.

This consideration is not applicable. The Reserve Banks do not hold liquid resources to meet obligations that may arise in operating the Fedwire Funds Service because the Reserve Banks, as the operational arm of the central bank of the United States, can create U.S. dollar liquidity as needed, and the Service only settles in U.S. dollars.

7.4 A CCP should maintain sufficient liquid resources in all relevant currencies to settle securities-related payments, make required variation margin payments, and meet other payment obligations on time with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions. In addition, a CCP that is involved in activities with a more-complex risk profile, or that is systemically important in multiple jurisdictions should consider maintaining additional liquidity resources sufficient to cover a wider range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions.

This consideration is not applicable because the Fedwire Funds Service is not a CCP.

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[110] In such a case, the participant may initiate the funds transfer again when it has sufficient funds or daylight overdraft capacity to make the transfer.

[111] For more detail, see the Reserve Banks' account management guide, which is a comprehensive reference guide for Reserve Bank customers to manage their master accounts. *See* Federal Reserve Banks, Account Management Guide, *available at* https://www.frbservices.org/assets/resources/rules-regulations/account-management-guide.pdf.

7.5 For the purpose of meeting its minimum liquid resource requirement, an FMI's qualifying liquid resources in each currency include cash at the central bank of issue and at creditworthy commercial banks, committed lines of credit, committed foreign exchange swaps, and committed repos, as well as highly marketable collateral held in custody and investments that are readily available and convertible into cash with prearranged and highly reliable funding arrangements, even in extreme but plausible market conditions. If an FMI has access to routine credit at the central bank of issue, the FMI may count such access as part of the minimum requirement to the extent it has collateral that is eligible for pledging to (or for conducting other appropriate forms of transactions with) the relevant central bank. All such resources should be available when needed.

This consideration is not applicable. As noted, the Reserve Banks are not subject to liquidity constraints, so there is no need for them to hold liquid resources.

7.6 An FMI may supplement its qualifying liquid resources with other forms of liquid resources. If the FMI does so, then these liquid resources should be in the form of assets that are likely to be saleable or acceptable as collateral for lines of credit, swaps, or repos on an ad hoc basis following a default, even if this cannot be reliably prearranged or guaranteed in extreme market conditions. Even if an FMI does not have access to routine central bank credit, it should still take account of what collateral is typically accepted by the relevant central bank, as such assets may be more likely to be liquid in stressed circumstances. An FMI should not assume the availability of emergency central bank credit as a part of its liquidity plan.

This consideration is not applicable. As noted, the Reserve Banks are not subject to liquidity constraints, so there is no need for them to hold liquid resources.

7.7 An FMI should obtain a high degree of confidence, through rigorous due diligence, that each provider of its minimum required qualifying liquid resources, whether a participant of the FMI or an external party, has sufficient information to understand and to manage its associated liquidity risks, and that it has the capacity to perform as required under its commitment. Where relevant to assessing a liquidity provider's performance reliability with respect to a particular currency, a liquidity provider's potential access to credit from the central bank of issue may be taken into account. An FMI should regularly test its procedures for accessing its liquid resources at a liquidity provider.

This consideration is not applicable. The Reserve Banks do not use external liquidity providers in connection with the Fedwire Funds Service because the Reserve Banks, as the operational arm of the central bank of the United States, can create U.S. dollar liquidity as needed, and the Service only settles in U.S. dollars.

7.8 An FMI with access to central bank accounts, payment services, or securities services should use these services, where practical, to enhance its management of liquidity risk.

The Reserve Banks are the operational arm of the central bank of the United States, and all Fedwire funds transfers are settled on the books of the Reserve Banks, so all activity through the Fedwire Funds Service is settled using central bank accounts and payment services.

7.9 An FMI should determine the amount and regularly test the sufficiency of its liquid resources through rigorous stress testing. An FMI should have clear procedures to report the results of its stress tests to appropriate decision makers at the FMI, and to use these results to evaluate the adequacy of and adjust its liquidity risk-management framework. In conducting stress testing, an FMI should consider a wide range of relevant scenarios. Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions. Scenarios should also take into account the design and operation of the FMI, include all entities that might pose material liquidity risks to the FMI (such as settlement banks, nostro agents, custodian banks, liquidity providers, and linked FMIs), and where appropriate, cover a multiday period. In all cases, an FMI should document its supporting rationale for, and should have appropriate governance arrangements relating to, the amount and form of total liquid resources it maintains.

As noted, the Fedwire Funds Service does not face liquidity risk, even under extreme-stress scenarios, so there is no need for the Reserve Banks to stress test their liquid resources.

7.10 An FMI should establish explicit rules and procedures that enable the FMI to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations on time following any individual or combined default among its participants. These rules and procedures should address unforeseen and potentially uncovered liquidity shortfalls and should aim to avoid unwinding, revoking, or delaying the same-day settlement of payment obligations. These rules and procedures should also indicate the FMI's process to replenish any liquidity resources it may employ during a stress event, so that it can continue to operate in a safe and sound manner.

The Fedwire Funds Service is an RTGS system with immediate settlement finality. By definition, such a system meets this requirement.

For more detail on these matters, see Principle 1, *Legal basis*, Principle 8, *Settlement finality*, and Principle 13, *Participant-default rules and procedures*.

Principle 8: Settlement finality
An FMI should provide clear and certain final settlement, at a minimum by the end of the value date. Where necessary or preferable, an FMI should provide final settlement intraday or in real time.

8.1 An FMI's rules and procedures should clearly define the point at which settlement is final.

As discussed in Principle 1, *Legal basis*, Regulation J provides the legal foundation for settlement finality in the Fedwire Funds Service. Payment to the receiving participant over the Service is final and irrevocable upon the crediting of the receiving participant's master account or when the advice of credit is sent to the receiving participant, whichever is earlier. Payment orders generally are processed promptly following a Reserve Bank's receipt of a transfer message.

As stated in section III under *Legal and Regulatory Framework*, the liquidation provisions of U.S. banking laws do not contain a zero-hour rule that would have the effect of voiding a settled funds transfer made over the Fedwire Funds Service involving an insolvent participant. Under U.S. banking law, payment from a sender to a receiver over the Fedwire Funds Service would not be affected by the subsequent insolvency of a participant unless a court finds the payment void after the fact as a fraudulent transfer or unlawful preference or due to other inequitable conduct. Such determinations, however, would be unrelated to the finality of a funds transfer made through the Fedwire Funds Service or of settlement for payment orders related to that funds transfer. In such a case, the payment from the Reserve Bank to the Fedwire receiver will remain final, but the payment from the originator to the beneficiary may be voided. Absent inequitable conduct on the part of a receiving bank, the receiving bank processing the payment should not be implicated by such determinations, which only affect the discharge of the obligations as between the originator and the beneficiary.

For more detail on a Reserve Bank's potential exposure to a sending participant once payment to the receiving participant is final, see Principle 4, *Credit risk*.

8.2 An FMI should complete final settlement no later than the end of the value date, and preferably intraday or in real time, to reduce settlement risk. An LVPS or SSS should consider adopting RTGS or multiple-batch processing during the settlement day.

The Reserve Banks settle payment orders in real time as the Fedwire Funds Service processes them. The Reserve Banks typically effect settlement by debiting the sending participant's Reserve Bank master account and crediting the receiving participant's Reserve Bank master account. However, payment to the receiving participant is final and irrevocable at the earlier of the credit to the receiving participant's master account or when the advice of credit is sent to the receiving participant.

An online receiving participant will receive a payment order as an electronic advice of credit through the Fedwire Funds Service promptly after the Service processes a transfer message. An online sending participant will receive an electronic acknowledgment of a payment order through the Service promptly after the Service processes the payment order.

The Reserve Banks provide all offline sending and receiving participants with advices and acknowledgments regarding payment orders processed through the Fedwire Funds Service with the participants' daily account statements. The Reserve Banks also attempt to provide advices of credit by telephone to offline receiving participants in most circumstances.[112]

8.3 An FMI should clearly define the point after which unsettled payments, transfer instructions, or other obligations may not be revoked by a participant.

Under Article 4A, as incorporated into subpart B of Regulation J, a Fedwire Funds Service sending participant is permitted to revoke a payment order only if the participant provides its Reserve Bank with a cancellation notice at a time and in a manner affording the Reserve Bank reasonable opportunity to act on the notice before the Reserve Bank accepts the payment order.[113] In practice, however, the Reserve Banks have eliminated the opportunity for participants to revoke payment orders sent through the Service because the Service's real-time, automated processing eliminates the time between the Reserve Banks' receipt and acceptance of payment orders. Once a payment order has been accepted by a Reserve Bank, a participant may no longer revoke it.[114]

Operating hours and cutoff times for submission of funds-transfer messages are clearly defined on a schedule published on the Reserve Banks' publicly accessible financial services website, FRBservices.org.[115] The Reserve Banks may unilaterally change these times as deemed necessary to facilitate special market needs.[116] Guidelines indicating how Fedwire Funds Service participants may request an extension of operating hours, as well as the limited and defined circumstances under which an extension may be granted, are published on FRBservices.org.[117] Any change in operating hours is broadcast electronically to all participants using the FedLine Direct solution. It is also posted on the FedLine homepage (for participants using the FedLine Advantage solution) and on the Service Status page of FRBservices.org (so offline participants and others would be aware).[118]

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[112] The Reserve Banks will not necessarily provide advices of credit by telephone for bank-to-bank transfers. *See* Operating Circular 6, *supra* note 10, ¶ 11.2. For more detail on the offline service, see section III, *General Background of the Fedwire Funds Service*.

[113] UCC § 4A-211(b).

[114] A participant may send a nonvalue message through the Fedwire Funds Service to request that a payment order accepted by its Reserve Bank be canceled or that the amount of the payment order otherwise be returned to the sender. The Fedwire Funds Service will send each of these requests for reversal to the Fedwire receiver identified in the message; these reversal requests will not, however, revoke payment orders accepted by a Reserve Bank.

[115] Federal Reserve Banks, Fedwire Funds Service Schedule, *available at* https://www.frbservices.org/resources/financial-services/wires/operating-hours.html.

[116] *Id.*

[117] *See* Federal Reserve Banks, Fedwire Funds Service Extension guidelines, *available at* https://www.frbservices.org/resources/financial-services/wires/extension-guidelines.html.

[118] *Id.*

Principle 9: Money settlements
An FMI should conduct its money settlements in central bank money where practical and available. If central bank money is not used, an FMI should minimize and strictly control the credit and liquidity risk arising from the use of commercial bank money.

9.1 An FMI should conduct its money settlements in central bank money, where practical and available, to avoid credit and liquidity risks.

All Fedwire funds transfers are settled on the books of the Reserve Banks and thus in central bank money. Refer to Principle 8, *Settlement finality*, for a discussion of the settlement finality of Fedwire funds transfers, Principle 4, *Credit risk,* for a discussion of how the Reserve Banks manage credit risk in connection with providing the Service, and Principle 7, *Liquidity risk*, for a discussion of liquidity risk.

9.2 If central bank money is not used, an FMI should conduct its money settlements using a settlement asset with little or no credit or liquidity risk.

This consideration is not applicable to the Fedwire Funds Service because, as stated in section 9.1, all Fedwire funds transfers settle in central bank money.

9.3 If an FMI settles in commercial bank money, it should monitor, manage, and limit its credit and liquidity risks arising from the commercial settlement banks. In particular, an FMI should establish and monitor adherence to strict criteria for its settlement banks that take account of, among other things, their regulation and supervision, creditworthiness, capitalization, access to liquidity, and operational reliability. An FMI should also monitor and manage the concentration of credit and liquidity exposures to its commercial settlement banks.

This consideration is not applicable to the Fedwire Funds Service because, as stated in section 9.1, all Fedwire funds transfers settle in central bank money.

9.4 If an FMI conducts money settlements on its own books, it should minimize and strictly control its credit and liquidity risks.

This consideration is not applicable to the Fedwire Funds Service because, as stated in section 9.1, all Fedwire funds transfers settle in central bank money, so the credit and liquidity risks with which the consideration is concerned are avoided.[119]

[119] Based on the explanatory notes in the PFMI, this consideration appears to be relevant only if two conditions are met: (1) money settlements do not occur in central bank money and (2) the FMI conducts money settlements on its own books. *See* Principles for Financial Market Infrastructures, *supra* note 2, ¶ 3.9.7. The Fedwire Funds Service conducts money settlements on its own books (technically, on the books of the Reserve Banks, which operate the Service), but those settlements occur in central bank money, as stated in section 9.1. Thus, only one of the two conditions is met, and the consideration is not applicable.

9.5 An FMI's legal agreements with any settlement banks should state clearly when transfers on the books of individual settlement banks are expected to occur, that transfers are to be final when effected, and that funds received should be transferable as soon as possible, at a minimum by the end of the day and ideally intraday, in order to enable the FMI and its participants to manage credit and liquidity risks.

This consideration is not applicable to the Fedwire Funds Service because the Service does not use third-party settlement banks. As stated in section 9.1, Fedwire funds transfers settle on the books of the Reserve Banks.

Principle 10: Physical deliveries
An FMI should clearly state its obligations with respect to the delivery of physical instruments or commodities and should identify, monitor, and manage the risks associated with such physical deliveries.

This principle is not applicable to the Fedwire Funds Service.

Principle 11: Central securities depositories
A CSD should have appropriate rules and procedures to help ensure the integrity of securities issues, and minimize and manage the risks associated with the safekeeping and transfer of securities. A CSD should maintain securities in an immobilized or dematerialized form for their transfer by book entry.

This principle is not applicable to the Fedwire Funds Service.

Principle 12: Exchange-of-value settlement systems

If an FMI settles transactions that involve the settlement of two linked obligations (for example, securities or foreign exchange transactions), it should eliminate principal risk by conditioning the final settlement of one obligation upon the final settlement of the other.

This principle is not applicable to the Fedwire Funds Service.

Principle 13: Participant-default rules and procedures
An FMI should have effective and clearly defined rules and procedures to manage a participant default. These rules and procedures should be designed to ensure that the FMI can take timely action to contain losses and liquidity pressures and continue to meet its obligations.

13.1 An FMI should have default rules and procedures that enable the FMI to continue to meet its obligations in the event of a participant default and that address the replenishment of resources following a default.

As a central bank–operated RTGS system, neither the Fedwire Funds Service itself nor its nondefaulting participants are affected by participant defaults. Instead, the Board of Governors requires the Reserve Banks to follow the PSR policy both in managing the credit risk that their customers (including Fedwire Funds Service participants) pose to them and in providing liquidity to those customers. As more fully described in Principle 4, *Credit risk*, the Reserve Banks perform those functions outside their role as operator of the Fedwire Funds Service.

The rules and procedures of the Fedwire Funds Service enable the Reserve Banks to continue to settle payment orders sent through the Service in a timely manner even if one or more participants default. This is true even in extreme market scenarios. Defaults by sending participants will not affect receiving participants because credits to receiving participants' master accounts are final at the earlier of when they are made or when advices of credit are sent by the Reserve Banks.[120] Therefore, nondefaulting participants in the Service are not exposed to losses caused by a defaulting participant's failure to meet an obligation to its Reserve Bank. Moreover, there is a clear framework for most Service participants to access intraday credit provided by the Reserve Banks under part II of the PSR Policy, which converts the liquidity risk that might otherwise be borne by participants into credit risk borne by the Reserve Banks. Reserve Banks, as the operational arm of the central bank of the United States, can absorb this risk because they are not subject to liquidity constraints and therefore can meet their obligations to all receiving participants even if one or more sending participants default. For more details, see Principle 7, *Liquidity risk*.

In addition, under Operating Circular 1 and Regulation J, each Service participant (either as a master account holder or as a sender of a Fedwire funds transfer) grants its Reserve Bank a security interest in all of its property in the possession or control of, or maintained with, any Reserve Bank to secure overdrafts in its master account or any other obligation owed to a Reserve Bank.[121] In the case of a participant default, the Reserve Banks retain the right to liquidate collateral or to take any other action authorized by law to satisfy outstanding obligations.

Through application of the rules governing the Service and the PSR policy, the Reserve Banks are able to contain and manage risks associated with participant defaults without transmitting those risks through the Fedwire Funds Service to the Service's direct participants or the financial system more generally.

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[120] For more detail on the finality of Fedwire funds transfers, see Principle 8, *Settlement finality*.

[121] In the case of Regulation J, the grant of security interest is somewhat more limited than stated here; it covers all "the sender's assets in the possession of, or held for the account of the Federal Reserve Bank" and attaches only when an overdraft or other obligation to that Reserve Bank becomes due and payable. *See* 12 CFR § 210.28(b)(3).

13.2 An FMI should be well prepared to implement its default rules and procedures, including any appropriate discretionary procedures provided for in its rules.

This consideration is not applicable because, as described in section 13.1, the Fedwire Funds Service does not have, and does not need, specialized default rules and procedures.

13.3 An FMI should publicly disclose key aspects of its default rules and procedures.

This consideration is not applicable because, as described in section 13.1, the Fedwire Funds Service does not have, and does not need, specialized default rules and procedures. All key rules and procedures pertaining to the Fedwire Funds Service are publicly disclosed on the Reserve Banks' financial services website, FRBservices.org. For more detail on the disclosure of rules and procedures governing the Service, see Principle 23, *Disclosure of rules, key procedures, and market data*.

13.4 An FMI should involve its participants and other stakeholders in the testing and review of the FMI's default procedures, including any close-out procedures. Such testing and review should be conducted at least annually or following material changes to the rules and procedures to ensure that they are practical and effective.

This consideration is not applicable because, as described in section 13.1, the Fedwire Funds Service does not have, and does not need, specialized default rules and procedures.

Principle 14: Segregation and portability

A CCP should have rules and procedures that enable the segregation and portability of positions of a participant's customers and the collateral provided to the CCP with respect to those positions.

This principle is not applicable to the Fedwire Funds Service.

Principle 15: General business risk
An FMI should identify, monitor, and manage its general business risk and hold sufficient liquid net assets funded by equity to cover potential general business losses so that it can continue operations and services as a going concern if those losses materialize. Further, liquid net assets should at all times be sufficient to ensure a recovery or orderly wind-down of critical operations and services.

15.1 An FMI should have robust management and control systems to identify, monitor, and manage general business risks, including losses from poor execution of business strategy, negative cash flows, or unexpected and excessively large operating expenses.

The WPO manages the risks and potential losses associated with the general business risk of operating the Fedwire Funds Service by carefully controlling costs and projecting revenues to help ensure that in setting fees for the Service, revenues match operating costs over the long run. Actual costs are monitored on an ongoing basis, and projected costs are closely scrutinized as part of the annual budgeting process. If the WPO's efforts to control operating costs fall short, it would consider raising prices or taking other measures to enhance revenue. Given the cost-recovery time horizon, described in greater detail below, these actions can be done in a measured way.

As required by the Monetary Control Act, the Fedwire Funds Service is among the Reserve Bank financial services required to be priced to fully recover, over the long run, all direct and indirect costs and imputed costs, including financing costs, taxes, and certain other expenses that would have been paid as well as the return on equity (i.e., profit) that would have been earned if a private business firm provided the services.[122] The Service is priced to cost recover over the long run, which serves as a mitigant to potential losses stemming from poor execution of business strategy, negative cash flows, or unexpected or excessively large operating expenses by allowing the Reserve Banks to adjust pricing as required (subject to approval by the Board of Governors). Cost-recovery performance, including the underlying revenue and cost statistics, are monitored on a monthly basis against budgeted performance. On an annual basis, the WPO conducts a repricing exercise to determine whether changes in prices for the following year are necessary to ensure long-term cost recovery.

The robust repricing exercise conducted by the WPO includes the development of volume and revenue projections that incorporate in-depth analysis of potential drivers of demand for the Service's revenue-generating products, such as economic conditions and exogenous market and policy developments. Using projected revenues and costs, the Reserve Banks conduct analysis on potential cost-recovery scenarios to determine the appropriate fees for the following year.[123] In addition, annual repricing is reviewed and approved by the Board of Governors, which publishes a description of the new pricing and the factors influencing the fee calculation in the Federal Register and on its public website.[124]

[122] *See* Principles for Pricing of Federal Reserve Bank Services, *supra* note 74, at 9–1568 (principle 3).

[123] *See, e.g.*, Board of Governors of the Federal Reserve System, Federal Reserve Bank Services, 85 Fed. Reg. 73037 (Nov. 16, 2020).

[124] *See, e.g., id.*

15.2 An FMI should hold liquid net assets funded by equity (such as common stock, disclosed reserves, or other retained earnings) so that it can continue operations and services as a going concern if it incurs general business losses. The amount of liquid net assets funded by equity an FMI should hold should be determined by its general business risk profile and the length of time required to achieve a recovery or orderly wind-down, as appropriate, of its critical operations and services if such action is taken.

The *Application of the Principles for Financial Market Infrastructures to Central Bank FMIs* notes that, given a central bank's inherent financial soundness, the requirement under Principle 15, *General business risk*, to hold liquid net assets funded by equity to cover business risk and support a recovery or wind-down plan does not apply to central bank–operated FMIs like the Fedwire Funds Service.[125] Nevertheless, to foster competition with private-sector FMIs, the Board of Governors mandates that the Reserve Banks hold six months of the Service's current operating expenses as unencumbered liquid financial assets and an equal or greater amount of equity on the pro forma balance sheet, which affects Reserve Bank priced services' fees.[126] The unencumbered liquid financial assets imputed on the pro forma balance sheet for priced services consist of federal funds (fed funds) and U.S. Treasury securities.[127]

The Service's six months of current operating expenses are computed based on its annual budget as approved by the Board of Governors.[128] The Service meets the requirement through the investments and equity imputed to the priced services pro forma balance sheet. If the imputed investments or equity in a given year would not be sufficient to cover the six-month requirement, additional investments or equity would be imputed, with the incremental cost associated with imputing additional investments or equity allocated exclusively to the Service.[129] In applying the PSR policy to the Reserve Banks' operation of the Fedwire Funds Service, the Board has stated that it "will monitor the implementation of Regulation HH and the final policy for issues of consistency and competitive equity between private-sector systems and the Fedwire Funds Service."[130]

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[125] Application of the Principles for Financial Market Infrastructures to Central Bank FMIs, *supra* note 6, at 1.

[126] *See* Board of Governors of the Federal Reserve System, Federal Reserve Bank Services, 85 Fed. Reg. 73037, 73039 (Nov. 16, 2020).

[127] A fed funds transaction is an unsecured, U.S. dollar–denominated loan to a depository institution by another depository institution or eligible institution.

[128] *See* Federal Reserve Bank Services, 85 Fed. Reg. at 73039.

[129] *See* Policy on Payment System Risk, 79 Fed. Reg. at 67329-30.

[130] *Id.* at 67330.

15.3 An FMI should maintain a viable recovery or orderly wind-down plan and should hold sufficient liquid net assets funded by equity to implement this plan. At a minimum, an FMI should hold liquid net assets funded by equity equal to at least six months of current operating expenses. These assets are in addition to resources held to cover participant defaults or other risks covered under the financial resources principles. However, equity held under international risk-based capital standards can be included where relevant and appropriate to avoid duplicate capital requirements.

As noted in *Application of the Principles for Financial Market Infrastructures to Central Bank FMIs*, although a central bank should plan for an orderly and transparent termination of a central bank–operated FMI service, a central bank's ability to ensure continuity of operations as necessary in extreme financial circumstances means that the requirements to prepare recovery and orderly wind-down plans do not apply.[131] Consistent with this notion and the fact that the Reserve Banks do not face the risk that a business shock would cause the Fedwire Funds Service to wind down in a disorderly manner, the Board of Governors does not require the Service to develop recovery or orderly wind-down plans.[132] The Board of Governors does, however, expect the Reserve Banks to follow policies consistent with financial stability and established principles of entering and exiting Reserve Bank priced services.[133]

As noted in section 15.2, the Board of Governors mandates that the Reserve Banks hold six months of the Fedwire Funds Service's current operating expenses as unencumbered liquid financial assets and an equal or greater amount of equity on the pro forma balance sheet.

15.4 Assets held to cover general business risk should be of high quality and sufficiently liquid in order to allow the FMI to meet its current and projected operating expenses under a range of scenarios, including in adverse market conditions.

The unencumbered liquid financial assets imputed on the pro forma balance sheet for the purposes described in section 15.2 consist of fed funds and U.S. Treasury securities. The Board of Governors considers such assets to be high quality and sufficiently liquid to meet the requirement it imposes on the Reserve Banks.

15.5 An FMI should maintain a viable plan for raising additional equity should its equity fall close to or below the amount needed. This plan should be approved by the board of directors and updated regularly.

The *Application of the Principles for Financial Market Infrastructures to Central Bank FMIs* also notes that the requirement under Principle 15, *General business risk*, to maintain a plan to raise additional equity does not apply to central bank–operated FMIs like the Fedwire Funds Service

[131] Application of the Principles for Financial Market Infrastructures to Central Bank FMIs, *supra* note 6, at 1.

[132] Policy on Payment System Risk, 79 Fed. Reg. at 67329.

[133] *Id.* If a Reserve Bank intended to withdraw from a priced service like the Fedwire Funds Service, among other factors, the Board of Governors would consider whether the public benefit of continuing to provide the service would outweigh the benefits of withdrawing from the service. Board of Governors of the Federal Reserve System, Factors for Evaluating Reserve Bank Requests to Withdraw from a Priced Service Line, *Federal Reserve Regulatory Service* 9–1575 (1992).

given a central bank's inherent financial soundness.[134] Accordingly, FRBNY's board of directors does not need to approve a plan to raise additional equity.

As stated in section 15.2, the Reserve Banks hold six months of the Fedwire Funds Service's current operating expenses as unencumbered liquid financial assets and equity on the pro forma balance sheet to satisfy the Board of Governors' requirement. If the investments and equity imputed to the priced services' balance sheet in a given year are not sufficient to cover the requirement, additional investments or equity would be imputed, with the incremental cost associated with imputing additional investments or equity allocated exclusively to the Service.

[134] Application of the Principles for Financial Market Infrastructures to Central Bank FMIs, *supra* note 6, at 1.

Principle 16: Custody and investment risks
An FMI should safeguard its own and its participants' assets and minimize the risk of loss on and delay in access to these assets. An FMI's investments should be in instruments with minimal credit, market, and liquidity risks.

16.1 An FMI should hold its own and its participants' assets at supervised and regulated entities that have robust accounting practices, safekeeping procedures, and internal controls that fully protect these assets.

The Fedwire Funds Service does not have assets that are independent of the assets of the Reserve Banks that operate the Service.

Moreover, the Fedwire Funds Service itself does not hold assets of its participants. Rather, the Service operates by debiting and crediting participants' accounts held directly on the books of one or more Reserve Banks. Balances held in master accounts at the Reserve Banks are not generally invested.[135]

The Reserve Banks' accounting practices and internal controls are robust. The Reserve Banks follow specialized accounting standards and practices developed by the Board of Governors, based on generally accepted accounting principles, and tailored to the unique nature of the Reserve Banks as the operational arm of the central bank of the United States.[136] To help ensure that the Reserve Banks maintain an effective internal control environment over financial reporting and operate efficiently and effectively, the Reserve Banks apply the 2013 integrated internal control framework of the Committee of Sponsoring Organizations of the Treadway Commission, voluntarily comply with the Sarbanes-Oxley Act of 2002, and implement and monitor a variety of other controls.

Reserve Bank accounting practices and internal controls are subject to internal and external audits and oversight by the Board of Governors and the GAO.

16.2 An FMI should have prompt access to its assets and the assets provided by participants, when required.

Because transfers through the Fedwire Funds Service are effected by debiting and crediting participants' master accounts held directly on the books of the Reserve Banks, and each participant grants the Reserve Banks a security interest in the participant's assets held at the Reserve Banks, the Reserve Banks have prompt access to assets of their participants to meet obligations the participants owe to the Reserve Banks.[137] While these assets are available to

[135] The exception is that FRBNY does invest balances it holds for certain foreign central banks and international organizations. These investments may take the form of overnight repurchase agreements or purchases of Treasury and other Fedwire securities that are held directly on FRBNY's books.

[136] The Reserve Banks' accounting practices deviate from generally accepted accounting principles in three material ways: (i) the Reserve Banks do not present a statement of cash flows, (ii) the Reserve Banks do not hold securities held for monetary policy purposes at fair value, and (iii) the Reserve Banks do not account for transactions executed for monetary policy purposes on trade date (they are accounted for on settlement date). For more detail, see the Reserve Banks' Financial Accounting Manual, which is *available at* http://www.federalreserve.gov/monetarypolicy/files/BSTfinaccountingmanual.pdf.

[137] Participants are generally free to withdraw assets held at a Reserve Bank, but the Reserve Banks will not release assets held in restricted accounts on their books if the assets secure an extension of credit by

settle activity through the Service and protect the Reserve Banks from losses they might incur in connection with providing the Service (among other losses), the availability of these assets or others to buffer Reserve Bank losses does not affect the Reserve Banks' ability to operate the Service because the Reserve Banks are not subject to capital or liquidity constraints.

16.3 An FMI should evaluate and understand its exposures to its custodian banks, taking into account the full scope of its relationships with each.

The Fedwire Funds Service does not use custodian banks. Refer to Principle 5, *Collateral*, for a discussion of Reserve Bank practices relating to collateral.

16.4 An FMI's investment strategy should be consistent with its overall risk-management strategy and fully disclosed to its participants, and investments should be secured by, or be claims on, high-quality obligors. These investments should allow for quick liquidation with little, if any, adverse price effect.

The Fedwire Funds Service does not have assets that are independent of the assets of the Reserve Banks that operate the Service, and the Reserve Banks do not invest their own assets or assets of their participants in connection with the Service.

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a Reserve Bank or are used to meet a clearing balance requirement imposed by a Reserve Bank. Under certain conditions, the Reserve Banks will allow participants to hold assets outside the Reserve Banks to secure potential extensions of credit by a Reserve Bank, which also will be restricted from release if an extension of credit against those assets is outstanding. These collateral arrangements allow the Reserve Banks to obtain a security interest in assets held at a supervised central securities depository or a custodian approved by the participant's ARB. For more detail on the Reserve Banks' collateral programs, see Principle 5, *Collateral*, and the Federal Reserve Collateral Guidelines, *supra* note 102.

Principle 17: Operational risk
An FMI should identify the plausible sources of operational risk, both internal and external, and mitigate their impact through the use of appropriate systems, policies, procedures, and controls. Systems should be designed to ensure a high degree of security and operational reliability and should have adequate, scalable capacity. Business continuity management should aim for timely recovery of operations and fulfillment of the FMI's obligations, including in the event of a wide-scale or major disruption.

17.1 An FMI should establish a robust operational risk-management framework with appropriate systems, policies, procedures, and controls to identify, monitor, and manage operational risks.

Operational Risk Framework, Identification, and Management

The WPO is responsible for operational risk management of the Fedwire Funds Service and leverages FRBNY's risk-management framework, risk-tolerance statement, and associated policies to manage and report on operational risks. This is done using various processes, tools, and reports, including self-assessments, risk-event reporting, internal audit evaluations, and residual risk analysis. The WPO evaluates operational risk to the Service across a range of factors and scenarios that would affect the provision of services. As described in section 3.1, FRBNY employs a three-lines-of-defense risk-management model that emphasizes interaction and communication between the first line (business line) and second line (central risk management), with independent oversight by the third line (internal audit).

As part of the first line of defense, the WPO is responsible for managing and reporting on the risks associated with advancing the policy objectives of the Fedwire Funds Service. The WPO carries out these responsibilities by, among other things, collecting, classifying, and analyzing operational risk events, leveraging internal and external gap assessments, and evaluating results of security testing to inform the risk profile and develop a forward-looking view of operational risks to the Service. FRBNY, as the Reserve Bank responsible for the wholesale services, including the Fedwire Funds Service, has agreements with a number of Reserve Banks that provide services necessary to operate the Service. To help ensure that the WPO is able to apply FRBNY's risk-management framework to the wholesale services, the WPO developed standard operating procedures under these agreements that are intended to align the risk-management practices of the wholesale operations sites at these other Reserve Banks with FRBNY's own risk-management framework.

The WPO risk team monitors and reports operational risk through risk-event analysis and reporting, residual risk ratings of key business processes supporting the Fedwire Funds Service, responses to control findings from FRBNY's internal audit group, and reporting on the Service's operational risk profile to FRBNY's central risk management function. The WPO also manages program risks from large technology initiatives involving the suite of applications that support the Service according to a project operating model that complies with the Reserve Banks' program and project management standard. The WPO assesses such risks, which are documented and tracked in risk registers, based on a mix of quantitative and qualitative factors. The WPO risk team reports on key risks and mitigation strategies to WPO management, FRBNY's central risk-management function, the audit and risk committee of FRBNY's board of directors, and the FSPC regularly.

Policies, Processes, and Controls

There are a range of policies, processes, and controls that support the operational risk framework governing the Fedwire Funds Service, including standard operating procedures, HR policies, and technology policies, which include an information security assurance policy and a program and project management standard for managing technology projects. These policies help to ensure effective ongoing operations and mitigate operational, technological, and human capital risks.

The WPO applies FRBNY's risk-event reporting policy, which defines the disclosure, notification, escalation, and reporting requirements for all risk events. The WPO's standard operating procedures incorporate the requirements of this policy to ensure alignment with FRBNY's risk-management framework.

In terms of HR policies, the WPO, the wholesale operations sites, and other Reserve Bank service providers, like National IT and the CRSO, work with human resources within their Reserve Banks to hire, train, and retain qualified personnel. The key job responsibilities and associated skills are defined and used to recruit talent with appropriate technical and operational backgrounds. All employees, contingent workers, and vendor personnel that perform certain wholesale services–related functions or that have access to wholesale services applications, including supporting technology infrastructure, must pass a rigorous security background screening process and are subject to periodic rescreening.

Staff members performing functions relating to or supporting the wholesale services are trained to perform their duties based on established standard operating procedures and practices in accordance with operation agreements and service-level agreements entered into by the various Reserve Banks.

All Reserve Bank employees are subject to a code of conduct and are subject to the same criminal conflict-of-interest statute that applies to federal government employees. Under those codes of conduct and the conflict-of-interest statute, a Reserve Bank employee is prohibited from participating personally and substantially in an official capacity in any particular matter in which, to the employee's knowledge, the employee (or certain related parties) has a financial interest if the particular matter will have a direct and predictable effect on that interest. Participation in a particular matter may include making a decision or recommendation, providing advice, or taking part in an investigation.

Reserve Bank employees are not permitted to own or control investments in depository institutions or affiliates of depository institutions. Employees are also prohibited from investing in certain thrift holding companies and investment funds that have a stated policy of concentrating their investments in the financial services sector. In order to avoid the appearance of conflicts of interest, Reserve Bank employees are generally not permitted to accept anything of value from a supervised institution or anyone that does business or seeks to do business with the Reserve Banks. This prohibition applies to gifts, meals, favors, and entertainment.

As described in detail in section 17.5, the Reserve Banks' approved information security program, Security Assurance for the Federal Reserve (SAFR), defines the rules, as well as the risk-management process, that help the Reserve Banks manage information security risk, including that posed to the Fedwire Funds Service. FRBNY's technology group and the WPO monitor and manage information security risks to the Service in accordance with SAFR.

The WPO also adheres to project and program management standards that define minimum standards for project management processes including governance, communication, scope, schedule, financial, risk, quality assurance, procurement, and vendor management. The model promotes effective collaboration within the wholesale services and among key Federal Reserve System stakeholders and constituencies, including National IT and the Board of Governors. On strategically important initiatives, the WPO is advised by project-specific executive advisory groups composed of executive-level Reserve Bank and Board of Governors staff.

The Fedwire Funds Service project operating model is aligned with the Reserve Banks' program and project management standards and provides a documented framework for identifying and controlling risks for projects within the Service. The project operating model also includes a risk-management plan and quality-assurance framework. The risk-management plan specifically provides a method to manage risks to increase the likelihood of executing a project successfully. The quality-assurance framework describes requirements for a Fedwire Funds Service product or service to be fulfilled appropriately and includes management of the quality of requirements, designs, and testing components.

17.2 An FMI's board of directors should clearly define the roles and responsibilities for addressing operational risk and should endorse the FMI's operational risk-management framework. Systems, operational policies, procedures, and controls should be reviewed, audited, and tested periodically and after significant changes.

As detailed in Principle 2, *Governance*, by written agreement among the Reserve Banks, FRBNY is responsible for the day-to-day management of the wholesale services, including the Fedwire Funds Service. FRBNY established the WPO as the area within FRBNY primarily responsible for the daily operational management of the Service. The audit and risk committee of FRBNY's board of directors is responsible for assessing the adequacy and effectiveness of FRBNY's financial reporting controls, independent internal audit function, and risk-management practices, including those relating to the Service. The committee receives reporting and briefings directly from FRBNY's chief risk officer, general auditor, and the WPO's product director. It is through the committee that FRBNY's board of directors has chosen to monitor and assess FRBNY's risk-management practices.[138] The committee reviews and approves FRBNY's risk-management framework every two years. It also approves FRBNY's risk-tolerance policy and statement annually. The audit and risk committee is also responsible for providing oversight, guidance and feedback regarding the WPO. As part of that responsibility, the committee reviews and approves the WPO's risk-tolerance statement at least once a year.

FRBNY's central risk-management function is responsible for supporting business areas, including the WPO, in the identification and assessment of key risks and for providing guidance to manage those risks in line with FRBNY's risk tolerance.

In addition, the FSPC provides direction to Reserve Bank financial services and considers risk-management issues of common concern across the services, including the Fedwire Funds Service.

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[138] For more detail on how the audit and risk committee assists FRBNY's board of directors, see sections 2.6 and 3.1.

Audit, Review, and Testing

FRBNY's internal audit group is responsible for providing an independent assessment of Fedwire Funds Service policies, procedures, and controls. The internal auditors perform an annual audit of the wholesale services and render an opinion of the internal control structure over wholesale activities executed across the Reserve Banks. The scope of the engagement is established through a risk-based planning process that identifies inherent risks and related controls for key activities related to the Service's operations, management, technology, and infrastructure. The internal auditors test and evaluate the design and effectiveness of the wholesale services' control environment to render an opinion. FRBNY's internal audit group actively participates on strategic Fedwire Funds Service technology change initiatives and periodically renders an opinion on project execution and the control environment.

17.3 An FMI should have clearly defined operational reliability objectives and should have policies in place that are designed to achieve those objectives.

The WPO has established performance objectives and service-level targets to benchmark operational availability, throughput, and end-to-end response times for the Fedwire Funds Service.[139] In 2020, the Fedwire Funds Service was available 99.990 percent of operating hours for all customers, which met the availability target of 99.985 percent of operating hours. The Reserve Banks have documented and communicated their operational objectives for the Service to internal stakeholders, including Reserve Bank service providers, through operating policies, business continuity management practices, and operations and service-level agreements.

The WPO has established monitoring controls and reviews performance metrics to evaluate the performance and reliability of the applications that support the Fedwire Funds Service. National IT provides periodic service-level agreement metric reporting, and the wholesale operations sites provide additional performance metrics (i.e., processing timeliness and accuracy) on a monthly basis. The WPO compiles this information and provides the combined monthly availability statistics and service quality metrics as part of its regular reporting to the FSPC.

17.4 An FMI should ensure that it has scalable capacity adequate to handle increasing stress volumes and to achieve its service-level objectives.

The Fedwire Funds Service's available capacity is designed to adapt to changes in business requirements, environmental changes, and other external influences such as natural disasters. National IT, which is responsible for much of the technological infrastructure on which the Service depends, has a dedicated resource planning department to coordinate capacity planning and performance monitoring activities across the Reserve Banks' technological infrastructure. The department is responsible for strategic and tactical planning in IT, as well as ongoing capacity management of networks, computing systems, storage systems, access solutions, and data center facilities for the Reserve Banks. The resource planning department designed National IT's capacity-planning framework to help ensure the Reserve Banks' server, network, and storage capacity is tightly coupled to system and infrastructure resource utilization. The distributed server, data center, network, access solutions, and storage assets needed to support the Fedwire Funds Service are included in the department's planning initiatives.

[139] The Service is considered unavailable when participants cannot send or receive Fedwire Funds Service messages because of the failure of Service-related applications, environmental software, or the Reserve Banks' telecommunications network infrastructure.

Furthermore, the department forecasts and evaluates application usage metrics used to assess the current capacity and projected usage of the Service's infrastructure and technology. The WPO has weekly review meetings with National IT at which availability metrics, risk events, and capacity-related information are periodically reviewed. Prior to the implementation of new application software releases for the Fedwire Funds Service, the WPO conducts stress testing to ensure the system meets performance requirements.

17.5 An FMI should have comprehensive physical and information security policies that address all potential vulnerabilities and threats.

The Reserve Banks' comprehensive principles, policies, and standards relating to information security constitute the SAFR program. The program is risk based and includes principles pertaining to both physical and information security. It is informed by industry best practices, federal standards (including those developed by the National Institute of Standards and Technology), and relevant supervisory guidance, such as that issued by the Federal Financial Institutions Examination Council. The WPO utilizes the physical security, information security, and risk-management principles embedded in the SAFR program to manage security assurance for the Fedwire Funds Service. Further, the WPO relies on National IT and local Information Security teams to advise on strategies and tactics to boost our cyber resiliency posture.

Physical Security and Information Security

SAFR's physical and environmental protection policy addresses physical security and associated risks posed to the Reserve Banks. The policy describes the procedures and controls to mitigate risks from physical access, visitors, water damage, fire, emergency shutoff, and power equipment and cable failure, among others. The WPO, the wholesale operations sites, and other Reserve Bank service providers use this policy to assess and mitigate physical security risks for the Service. The SAFR program includes information security principles, policies, standards, checklists, and other supporting security artifacts that help ensure the Reserve Banks have sound information security practices. The program establishes security requirements across 18 control groups to help the Reserve Banks protect the confidentiality, integrity, and availability of their information systems and the information those systems process, store, and transmit. The information security principles cover information security, access, classification and handling, personnel, and physical access. In addition, SAFR includes information security standards that provide controls for identifying, assessing, and managing security threats and vulnerabilities. These standards and controls help mitigate risks to the Fedwire Funds Service relating to data loss and leakage, data classification, security patching, personnel screening, privileged account monitoring, intrusion detection, end-user device protection, network access, server security, device configuration, and application vulnerability.

As described in Principle 2, *Governance*, the Federal Reserve Bank of Richmond operates National IT to provide a variety of services relating to information technology for the Reserve Banks, including information security. As a part of National IT, the National Information Security Assurance function in Richmond administers and manages the SAFR program for the Reserve Banks.

In addition, National IT has established risk-management lifecycle documents that outline periodic risk assessment activities that can be undertaken at various points in the SAFR process. The purpose of the lifecycle documents is to establish approved methodologies and approaches for managing risk to Reserve Bank information and information systems. A central incident response team is responsible for coordinating the processes and controls related to security monitoring and incident responses. The team achieves this through proactive intelligence gathering, threat analysis, forensic investigations, security alerting, and incident response services.

Overall, FRBNY has the responsibility for ensuring that it and the other Reserve Banks that support the operations of the Fedwire Funds Service comply with applicable information security policies. To ensure FRBNY fulfills this responsibility, the WPO coordinates SAFR activities for the wholesale services, which helps ensure consistent risk-management practices across Reserve Banks with FRBNY's risk-management framework.

Operating Circular 5, *Electronic Access*, includes a high-level description of certain aspects of the Reserve Banks' information security program, as it applies to Fedwire Funds Service participants and their service providers that use the Reserve Banks' electronic access solutions.[140]

17.6 An FMI should have a business continuity plan that addresses events posing a significant risk of disrupting operations, including events that could cause a wide-scale or major disruption. The plan should incorporate the use of a secondary site and should be designed to ensure that critical IT systems can resume operations within two hours following disruptive events. The plan should be designed to enable the FMI to complete settlement by the end of the day of the disruption, even in case of extreme circumstances. The FMI should regularly test these arrangements.

Objectives and Design of Business Continuity Plan

The WPO has a comprehensive business continuity plan to assess wholesale services–related application resiliency and contingency and to ensure a high degree of operational reliability for the Fedwire Funds Service suite of applications. The plan is based on the Federal Reserve System Business Continuity Framework, a series of business continuity principles developed by all 12 Reserve Banks to establish a common foundation for business continuity management across the Reserve Banks. The framework helps ensure that the WPO, in developing and maintaining the business continuity plan for the Fedwire Funds Service, takes a methodical approach to identifying, assessing, and controlling business continuity risks. The business continuity plan defines the roles and responsibilities, criticality assessment, and testing strategy for the Fedwire Funds Service. Roles and responsibilities for continuity planning and testing are shared among the WPO, the wholesale operations sites, and other Reserve Bank service providers. The business continuity plan for the Service was developed to address a variety of scenarios, such as loss of critical staff, loss of facilities, and loss of IT resources. The WPO reviews the plan at least annually and updates it as needed based on changes to business processes or system upgrades.

The WPO's business continuity plan was developed in accordance with the key elements of the *Interagency Paper on Sound Practices to Strengthen the Resilience of the U.S. Financial System.*[141] Specifically, the WPO's business continuity objectives include the following: (1) the

[140] Operating Circular 5, *supra* note 84, app. A.

[141] *See* Board of Governors of the Federal Reserve System, Office of the Comptroller of the Currency, & Securities and Exchange Commission, *Interagency Paper on Sound Practices to Strengthen the Resilience of the U.S. Financial System* (May 28, 2003), *available at* http://www.federalreserve.gov/board

rapid recovery and timely resumption of critical operations in advance of or following a wide-scale disruption; (2) the rapid recovery and timely resumption of critical operations in advance of or following the loss or inaccessibility of staff in at least one major operating location; and (3) a high level of confidence, through ongoing use or robust testing, that critical internal and external continuity arrangements are effective and compatible.

To help meet these objectives, the WPO's business continuity plan is augmented by Federal Reserve System-level communication and incident management protocols. These documents address the evaluation of incident impact, guide decision-making, and assign responsibilities across multiple Reserve Banks and business lines that provide or support Federal Reserve Financial Services. The protocols incorporate incident and problem management processes established by the Reserve Banks (1) to manage the rapid deployment of skilled personnel and resources to restore normal operations as quickly as possible and (2) to facilitate the review of critical incidents, determine root causes, and assist in the prevention of recurring problems. These roles are shared among the WPO and other Reserve Bank service providers, including National IT and the CRSO. The responsibilities include invoking incident response plans, restoring infrastructure, reestablishing electronic access for customers, validating application functionality, reconciling data, performing recovery analysis, and coordinating internal and external communications. Additionally, National IT is charged with deterring and remediating the technical aspects of information security incidents that affect the Service. National IT also coordinates and prioritizes communications with internal and external stakeholders, so that they are aware of certain incidents and may respond by mitigating potential risks. The Reserve Banks also have decision-making protocols concerning the ongoing operation (or resumption) of the Service that may be triggered depending on the event and its severity.

Redundant Data Centers

The Reserve Banks operate the applications that are necessary for the operation of the Fedwire Funds Service from multiple data centers located with sufficient geographical dispersion to mitigate the effects of most natural disasters, power and telecommunication outages, and other widespread regional disruptions. Wholesale service operations regularly rotate between two primary data centers. The data centers have the necessary staffing, equipment, and security to resume operations and include various contingency features, such as redundant power feeds, environmental and emergency control systems, dual computer and network operations centers, and dual customer service centers. The primary data centers include full same-site processing redundancy to address isolated component failures. The primary data centers also support full cross-site processing redundancy, so either data center can quickly take over production processing if the data center that had been processing production work is, or is expected to be, disrupted.

In the event of a primary data center outage or in advance of an impending event, the affected applications will be recovered to the other primary data center within an established time objective, with a somewhat longer recovery time for the various ancillary applications supporting the Fedwire Funds Service. These recovery objectives are documented requirements in agreements with Reserve Bank service providers. If, in the course of restoring production-processing capability, the Reserve Banks detect data loss, they have reconciliation processes in place to identify and inform customers of transactions that may need to be resubmitted.

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docs/srletters/2003/sr0309.htm.

The wholesale operations sites that support the Fedwire Funds Service are located in different geographic regions of the country to help ensure they can continue to support the Service even in the midst of a widespread disruption. Furthermore, the Reserve Banks split personnel with key recovery and crisis management responsibilities between these locations to help ensure critical operations can be conducted if a disruptive event affects a particular region. Fully trained personnel capable of opening, running, and closing the applications that support the Fedwire Funds Service are located in multiple locations around the country. These personnel routinely provide production support to help ensure their skills remain current.

Review and Testing

The WPO reviews and tests its business continuity capabilities regularly. The WPO and its Reserve Bank service providers conduct several alternate-site recovery tests per year for the Fedwire Funds Service. In addition, once a year, the Reserve Banks conduct a third-site test in which core Service applications are failed over to the Service's backup data center.

The WPO requires certain Fedwire Funds Service participants with significant transaction value and volume to participate in at least two of these business resumption tests per year, at least one of which must be conducted from the participants' backup processing sites. During the contingency tests, participants test their ability to reconcile and resume transaction processing following a Fedwire Funds Service application recovery event. The WPO coordinates the schedule of these business resumption tests so they may occur when other FMIs are conducting similar contingency tests. In addition, the WPO requires certain participants accessing the Fedwire Funds Service through the FedLine Direct solution to establish a separate and diverse FedLine Advantage connection as a backup and test the import/export feature in the FedPayments Manager-Funds application annually.

Furthermore, the WPO regularly tests its full cross-site processing redundancy, including by rotating wholesale service operations between the primary data centers for production processing multiple times a year. The WPO also coordinates and participates in tabletop exercises to test resiliency procedures. Such tests help the WPO identify risks the Fedwire Funds Service faces and poses to others under these scenarios, and the WPO uses that knowledge to help it improve Service resiliency.

Finally, the Reserve Banks have taken a number of steps to minimize the likelihood that an event at one of their locations will affect the operation of the Fedwire Funds Service. For example, Reserve Banks routinely test their own physical security, evacuation and emergency notification plans, smoke-detection systems fire extinguishers, and uninterruptible power supplies. They also have in place procedures to mitigate the impact of an event that results in a reduction of on-premise staff across multiple locations.[142] The WPO has the technology and personnel capability to support normal business operations primarily through staff telecommuting arrangements.

Other Measures

The WPO has developed procedures to position the Reserve Banks to process at least some Fedwire Funds Service transactions in the event of a protracted disruption of the Service. The

[142] As an example, additional staff were trained on critical business activities during the COVID-19 pandemic to ensure staffing coverage.

procedures are tailored to those transactions that, if not processed by the Fedwire Funds Service, will directly or indirectly result in a participant failing to meet its obligations at other critical financial market infrastructures. The WPO is working toward full implementation of the procedures.

17.7 An FMI should identify, monitor, and manage the risks that key participants, other FMIs, and service and utility providers might pose to its operations. In addition, an FMI should identify, monitor, and manage the risks its operations might pose to other FMIs.

Risks to the FMI's Own Operations

As discussed in Principle 3, *Framework for the comprehensive management of risks*, the WPO identifies and evaluates the material risks that the Fedwire Funds Service bears from other entities, including its key participants, other FMIs, and service and utility providers and acts to manage those risks. Among those risks, the Fedwire Funds Service faces operational risk from its multiple Reserve Bank and third-party service providers, including utilities such as electricity and telecommunications network suppliers. As a result, the WPO closely monitors and actively manages these service providers.

As discussed in Principle 2, *Governance*, two such critical service providers are the CRSO, which operates the nationwide electronic network on which the Fedwire Funds Service relies for sending and receiving messages, and National IT, which operates the critical computing environment in which the Fedwire Funds Service operates. Under agreements between all 12 Reserve Banks, the Chicago and Richmond Reserve Banks manage operational risks associated with the services they provide through the CRSO and National IT, respectively, including identifying security, resiliency, and contingency risks related to those services, as well as proposing and implementing appropriate mitigation of those risks in cooperation with the other Reserve Banks. Like all Reserve Banks, the Chicago and Richmond Reserve Banks are each subject to SAFR,[143] and FRBNY requires both Reserve Banks to disclose vulnerabilities identified through the SAFR program that might affect the Fedwire Funds Service, as well as plans to remediate those vulnerabilities. Because FRBNY remains responsible for the overall security and resiliency of the Fedwire Funds Service, FRBNY continually and actively engages with these critical Reserve Bank service providers, both bilaterally and through activities of various Reserve Bank committees, concerning operational risk discussions and resiliency and contingency planning.

Beyond these Reserve Bank service providers, the Fedwire Funds Service is also reliant on certain critical external service providers, such as telecommunications companies, to ensure reliable connectivity to the Service for participants. To address risks from this dependency, the CRSO has taken steps to diversify the telecommunications network used by the Fedwire Funds Service. The CRSO and WPO coordinate to routinely test connections to that network.

The Fedwire Funds Service does not face material operational risk from other FMIs or from its participants. Reserve Bank service providers, such as National IT and the CRSO, monitor,

[143] For more detail on SAFR, see section 17.5.

plan, and test capacity of the electronic connections customers use to access the Service.[144] The WPO analyzes customer transaction volume to determine capacity.

The WPO analyzes key participant activity, with a focus on participants that collectively generate the majority of Fedwire Funds Service transactions, based on transaction volume and value, to determine an appropriate business resumption test model. The WPO employs a testing protocol that allows for a simulated disruption of the production processing environment, with the subsequent activation of a backup data center. This structure provides an opportunity for certain participants with significant transaction value and volume to validate their ability to establish connectivity with the backup data center, reconcile their message traffic, and resume normal processing. As discussed in section 17.6, certain Fedwire Funds Service customers are required to participate in at least two scheduled business resumptions tests per year. Each test is designed to demonstrate the ability of the Service and its customers to resume processing in the event of a disruption to production processing at one of the data centers. Service participants that play a significant role in critical financial markets or are core clearing and settlement organizations are expected to adopt the practices outlined in the *Interagency Paper on Sound Practices to Strengthen the Resilience of the U.S. Financial System*, which was adopted in the wake of the September 11, 2001, terrorist attacks.[145] The interagency paper aimed to strengthen the overall resilience of the U.S. financial system in the event of a widespread disruption by restating three key, broadly agreed-upon business continuity objectives for all financial firms and by outlining four sound practices that are designed to minimize the immediate systemic effects of a widespread disruption on critical financial markets.[146]

Risks Posed to Other FMIs

The Reserve Banks recognize that the wholesale services, including the Fedwire Funds Service, are vital to the stability of the broader financial industry and, accordingly, pose material risk to other entities, including other FMIs. As a result, as described in Principle 3, *Framework for the comprehensive management of risks*, and in section 17.6, the Fedwire Funds Service is designed for high availability and resiliency. The WPO regularly reviews the risk the Service poses to other entities and considers enhancements to mitigate that risk. This includes not only identifying and evaluating scenarios in which the Service may not be available to provide critical services but also considering alternative means, such as manual processing, for meeting the needs of other Service participants under these scenarios, including contingency arrangements with other FMIs.

As stated in section 17.6, the WPO has a business continuity plan that is designed to help ensure continuous operation and availability of the Fedwire Funds Service through various

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[144] For more detail on the evaluation of operational risks posed by tiered participation, see Principle 19, *Tiered participation arrangements*.

[145] *See* Interagency Paper on Sound Practices to Strengthen the Resilience of the U.S. Financial System, *supra* note 141.

[146] *See id.* at 1-2. The interagency paper specifies the same three business-continuity objectives outlined in section 17.6. The four sound practices in the paper are the following: (1) the identification of clearing and settlement activities in support of critical financial markets; (2) the determination of appropriate recovery and resumption objectives for such activities; (3) the maintenance of sufficient geographically dispersed resources to meet recovery and resumption objectives; and (4) the routine use or test of recovery and resumption arrangements.

scenarios, as well as rapid recovery and timely resumption of operations if operations of the Service are nevertheless disrupted. The plan addresses disruptions from a variety of causes, including widespread disruptions to telecommunications, transportation, electric power, and other critical infrastructure in the geographic regions where the wholesale operations sites that support the Service are located. The WPO routinely tests the business resiliency of the Service through regular business resumption testing. The capacity of the Service's suite of applications, as well as its electronic access solutions, are monitored and tested regularly by National IT and the CRSO.

The WPO continues to strengthen the resiliency profile of the wholesale services, including the Fedwire Funds Service, through ongoing modernization of core applications that support the wholesale services and through ongoing resiliency initiatives.

Principle 18: Access and participation requirements
An FMI should have objective, risk-based, and publicly disclosed criteria for participation, which permit fair and open access.

18.1 An FMI should allow for fair and open access to its services, including by direct and, where relevant, indirect participants and other FMIs, based on reasonable risk-related participation requirements.

Because the Fedwire Funds Service is a central bank–operated payments system, U.S. law and central bank policies govern the classes of entities that are eligible to access it. U.S. law limits the customer base Reserve Banks may serve principally to depository institutions. The PFMI recognize limitations like this and note that central bank–operated systems may exclude certain categories of institutions because of legislative constraints.[147] In revising part I of the PSR policy to incorporate the risk-management and transparency standards in the PFMI, the Board of Governors also recognized that the application of this principle to the Fedwire Funds Service might require flexibility.[148]

The Reserve Banks are authorized under U.S. law to provide the Fedwire Funds Service to the following entities:

- Depository institutions, as defined in section 19(b)(1)(A) of the Federal Reserve Act;[149]
- U.S. agencies and branches of foreign banks, as defined in section 1(b) of the International Banking Act of 1978;[150]
- State member banks admitted to the Federal Reserve System under Regulation H of the Board of Governors;[151]
- Treasury and other entities specifically authorized by federal statute to use the Reserve Banks as fiscal agents or depositories;[152]
- Entities designated by the Secretary of the Treasury in accordance with section 15 of the Federal Reserve Act;[153]
- Edge Act and Agreement corporations authorized under paragraph 3 of section 25 and section 25A, respectively, of the Federal Reserve Act;[154] and
- Foreign central banks, foreign monetary authorities, foreign governments, and certain international organizations, subject to the approval of the Board of Governors.

[147] Principles for Financial Market Infrastructures, *supra* note 2, n.144.

[148] *See* PSR policy, *supra* note 4, n.19.

[149] 12 USC§ 461(b)(1)(A).

[150] 12 USC §§ 3101(1), 3101(3).

[151] 12 CFR pt. 208.

[152] *See, e.g.,* 12 USC § 393 (Farm Credit System); 12 USC § 1435 (Federal Home Loan Banks); 12 USC § 1441(h)(2) (Financing Corporation); 12 USC § 1441b(h)(2) (Resolution Funding Corporation); 12 USC § 1723a(g) (Government National Mortgage Association and Federal National Mortgage Association); 12 USC § 1452(d) (Federal Home Loan Mortgage Corporation); 12 USC § 2279aa-3(d) (Federal Agricultural Mortgage Corporation).

[153] 12 USC § 391.

[154] 12 USC §§ 611, 601(*third*).

The Dodd-Frank Wall Street Reform and Consumer Protection Act also allows the Board of Governors to authorize a Reserve Bank to provide Reserve Bank services, including the Fedwire Funds Service, to financial market utilities designated as systemically important by the Financial Stability Oversight Council.[155]

Entities that are not eligible for direct access to the Fedwire Funds Service may access the Service indirectly as customers of direct Service participants. The Service does not place any restrictions on such indirect access. For more detail on indirect participation, see Principle 19, *Tiered participation arrangements.*

18.2 An FMI's participation requirements should be justified in terms of the safety and efficiency of the FMI and the markets it serves, be tailored to and commensurate with the FMI's specific risks, and be publicly disclosed. Subject to maintaining acceptable risk control standards, an FMI should endeavor to set requirements that have the least-restrictive impact on access that circumstances permit.

The Reserve Banks seek to provide broad access to the Fedwire Funds Service to legally eligible entities, but the Reserve Banks must do so in accordance with Federal Reserve risk-management policies. Participants' ARBs, not the Fedwire Funds Service itself, make risk-management decisions under these Federal Reserve risk-management policies. At the time an institution applies for a master account or financial services, the institution's ARB reviews the applicant's eligibility, initiates or updates its assessment of counterparty credit risk, and may apply risk controls that will affect how the customer uses Reserve Bank services, if appropriate.[156] As a general matter, each ARB imposes similar risk controls on institutions that have similar risk profiles, and each ARB seeks to impose controls that are no more restrictive than necessary to manage the risks posed by that particular customer. The actions that an ARB might take to address the credit risk posed by particular customers (including customers that are Service participants) are addressed in Reserve Bank operating circulars and in part II of the PSR policy. For more detail on how the Reserve Banks manage risk, see Principle 4, *Credit risk*, Principle 5, *Collateral*, and Principle 7, *Liquidity risk*.

18.3 An FMI should monitor compliance with its participation requirements on an ongoing basis, and have clearly defined and publicly disclosed procedures for facilitating the suspension and orderly exit of a participant that breaches, or no longer meets, the participation requirements.

Each ARB performs ongoing surveillance and reviews the credit risk that its account holders pose to it (or another Reserve Bank) at least quarterly to ensure appropriate risk controls are applied. If necessary, the ARB will implement or adjust risk controls at the time of those reviews or more frequently if it believes that it faces excessive risk exposure (e.g., if the account holder's financial condition is deteriorating).

A Reserve Bank may take remedial action to terminate a participant's access to the Fedwire Funds Service under certain circumstances, including if the participant is no longer eligible, if the participant poses undue risk to the Reserve Bank maintaining its master account, or if the

[155] *See* Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, § 806(a), 124 Stat. 1376, 1811 (2010) (codified at 12 USC § 5465(a)).

[156] For example, the ARB may require customers that engage in certain transactions to maintain collateral or adequate balances with a Reserve Bank in an amount the ARB determines.

participant materially or persistently violates the rules, policies, or procedures applicable to the Service. For more detail on the remedial actions a Reserve Bank may take, see Operating Circular 1, Operating Circular 6, Regulation J, part II of the PSR policy, and Principle 4, *Credit risk*.

As mentioned above, risk-management decisions are made by ARBs and not by the Reserve Banks as operator of the Fedwire Funds Service.

Principle 19: Tiered participation arrangements
An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements.

19.1 An FMI should ensure that its rules, procedures, and agreements allow it to gather basic information about indirect participation in order to identify, monitor, and manage any material risks to the FMI arising from such tiered participation arrangements.

On behalf of the 12 Reserve Banks that operate the Fedwire Funds Service, the WPO evaluated the operational, credit, and liquidity risks posed by tiered participation in the Service and concluded that indirect participants do not pose material risks to the Service that cannot be addressed through managing those same risks that arise from direct participants.

Consequently, the Reserve Banks have not put in place rules, procedures, or agreements to gather information to help them identify, monitor, and manage specific risks to the Service posed by indirect participants. The WPO has procedures in place to review its assessment of the risks posed to the Service from tiered participation at least biennially or more frequently if the Service or the environment in which it operates changes significantly.

19.2 An FMI should identify material dependencies between direct and indirect participants that might affect the FMI.

As noted in section 19.1, the Reserve Banks do not routinely gather information that might assist them in identifying material dependencies between direct and indirect participants in the Fedwire Funds Service. Nevertheless, the Reserve Banks believe that the measures they have taken to address material risks posed to the Service by direct participants are sufficient to address any risks that might arise from indirect participants.

19.3 An FMI should identify indirect participants responsible for a significant proportion of transactions processed by the FMI and indirect participants whose transaction volumes or values are large relative to the capacity of the direct participants through which they access the FMI in order to manage the risks arising from these transactions.

Evaluation of Operational Risks Posed by Tiered Participation

To begin its analysis of potential operational risks posed by tiered participation in the Fedwire Funds Service, the WPO examined whether such tiered participation could result in spikes in transaction volume, which might overwhelm the processing capacity of the Service or supporting applications. Direct participants of the Service send Fedwire funds transfers for their own purposes or on behalf of their customers (i.e., indirect participants). If an indirect participant started sending Fedwire funds transfers through a different Service participant or if it became a direct participant itself, such a change would not necessarily increase overall Service transaction volume. The volume would only increase to the extent that such a change shifted either (i) funds transfers currently effected on the books of a direct Service participant (i.e., so-called “book transfers”) to transfers effected by the Reserve Banks over the Fedwire Funds Service or (ii) funds transfers currently sent over another funds-transfer system to the Service.

The WPO analyzed different scenarios in which changes made by indirect participants could result in significant volume shifting to the Fedwire Funds Service that would exceed processing capacity and thus pose operational risk to the Service. The WPO also assessed the impact on the electronic access solutions used by Service customers if changes made by indirect participants caused an increase in volume being sent over a specific access solution. Based on this analysis, the WPO concluded that the probability of substantial volume increases emanating from the shift of the type of volume described above was low, and, even if there were significant increases in volume, both the Service and the electronic access solutions would have sufficient capacity to handle the volume.

The WPO also considered the impact on the Fedwire Funds Service from a cybersecurity incident originating at an indirect participant and concluded that the likelihood of a cyber-event originating from an indirect participant posing material risk to the Service is low.

The Reserve Banks require Service participants to implement certain security measures, which include the following:

- security protocols embedded in the hardware and software associated with the equipment used to initiate, transmit, and receive payment orders;
- access controls that grant access to the Fedwire Funds Service, such as identification codes, confidential passwords, and digital certificates; and
- encryption of payment orders during the transmission process over a private network or virtual private network.

In addition, each Fedwire Funds Service participant that sends or receives payment orders electronically must implement its own physical and logical security, as well as management controls, that appropriately protect the hardware, software, and access controls used in the funds transfer process from unauthorized access and use. Fedwire Funds Service senders must also have controls in place to ensure that initiation of a payment order occurs from locations it has authorized and requires action by more than one of its employees. Operating Circular 5, *Electronic Access*, sets forth the information security and access control requirements applicable to Fedwire Funds Service participants and their service providers that use the Reserve Banks' electronic access solutions, including procedures and processes requiring immediate notification to the Reserve Banks of any suspected, threatened, or known security breach.[157]

Because indirect participants do not have a direct electronic connection to the Fedwire Funds Service, the likelihood that a cyber event originating from an indirect participant would pose material risk to the Service is reduced. The Reserve Banks continue to enhance their cyber response capabilities and protocols with respect to cyber incidents targeting Fedwire Funds Service participants. This includes improving communication and coordination across the Federal Reserve System and conducting cyber scenario tabletops to exercise potential actions across Reserve Bank financial services.

Last, the overwhelming majority of Fedwire Funds Service participants are supervised financial institutions that follow the Federal Financial Institutions Examination Council guidance on cybersecurity. This helps ensure that direct Fedwire Funds Service participants have taken steps to protect the security of their connections with their customers (indirect participants).

[157] Operating Circular 5, *supra* note 84, app. A.

The robustness of the Reserve Banks' security procedures are assessed periodically.

Evaluation of Credit and Liquidity Risks Posed by Tiered Participation

Each Reserve Bank manages credit risk posed by its customers across all Reserve Bank financial services, not just the Fedwire Funds Service. By policy of the Board of Governors, credit risk management must be handled by Reserve Bank employees that are separate from the employees that provide Reserve Bank financial services, such as the Fedwire Funds Service.[158] The discussion below, therefore, considers how the Reserve Banks address credit exposure posed by indirect participants through their credit risk-management functions (rather than the Fedwire Funds Service). The risk of loss to a Reserve Bank includes a situation in which the failure of a direct participant's customer (i.e., indirect participant) causes the direct participant to default or causes liquidity problems for other direct participants that are anticipating payments from the defaulted direct participant. In such a scenario, a Reserve Bank would bear greater credit risk if a Service participant were unable to cover an overdraft in its master account or otherwise meet its obligations to the Reserve Bank as expected. The Reserve Banks have policies in place to manage and mitigate these risks, however. Specifically, the Board of Governors has issued the PSR policy, which is binding on Reserve Banks. The PSR policy recognizes that the Reserve Banks have an important role in fostering the smooth functioning of payment and settlement systems by providing intraday liquidity to depository institutions. At the same time, the PSR policy seeks to control the risks assumed by the Reserve Banks in providing that intraday credit.

Part II of the PSR policy governs the provision of intraday credit (or daylight overdrafts) by Reserve Banks to their account holders, including direct Fedwire Funds Service participants. A depository institution applying for intraday credit through the self-assessment process must evaluate its intraday funds-management procedures and its procedures for evaluating the financial condition of and establishing intraday credit limits for its customers in order to determine if it is able to fund its positions in each payment or settlement system in which it participates even if a major customer defaults.[159] For more detail on how the Reserve Banks manage credit risk on an ongoing basis, see Principle 4, *Credit risk*.

Although the Reserve Banks do not generally collect information about indirect participants from direct Fedwire Funds Service participants, the Reserve Banks are able to leverage other information collected through the supervisory process to inform their condition monitoring and credit risk management of certain Reserve Bank customers, including certain direct Service participants.[160] The Reserve Bank employees who monitor and make credit decisions are not the employees charged with running the Service; credit information is not permitted to be shared with the WPO and other Reserve Bank employees responsible for providing financial services absent extraordinary circumstances. Nevertheless, such information helps the ARB understand

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[158] *See* Standards Related to Priced-Service Activities of the Federal Reserve Banks, *supra* note 21, at 9–1570.

[159] The Board of Governors' website contains additional information on the self-assessment process. *See* Board of Governors of the Federal Reserve System, Guide to the Federal Reserve's Payment System Risk Policy on Intraday Credit (effective July 12, 2012), *available at* http://www.federalreserve.gov/paymentsystems /files/psr_guide.pdf.

[160] In certain instances, Reserve Banks may not have access to supervisory information for particular Reserve Bank customers. In that case, Reserve Banks would evaluate the financial and market information they have available in order to formulate a credit opinion of the customer in question.

the materiality of any single counterparty to a particular supervised Reserve Bank customer (including Service participants) and the importance of that Reserve Bank customer to indirect participants that are supervised.[161]

Moreover, indirect participation in the Fedwire Funds Service does not appear to present incremental credit risk to Service participants at large; only the direct Service participant that has the relationship with the indirect participant would be immediately affected. A default by either a direct Service participant or an indirect participant would not affect the finality of the settlement of payment orders processed through the Service. Defaults by sending Service participants would not affect receiving participants because credits to receiving participants' master accounts are final at the earlier of when they are made, or when advices of credit are sent by the Reserve Banks. Moreover, because the Reserve Banks are not subject to liquidity constraints, they would be able to meet their payment obligations to all receiving participants even if one or more sending participants should fail. This would be true even if the direct participant default stemmed from a default by an indirect participant and even in periods marked by liquidity-related market stress events. For more detail on the Reserve Banks' ability to meet their obligations following a direct participant's default, see Principle 13, *Participant-default rules and procedures*.

Evaluation of Legal Risks Posed by Tiered Participation

Regulation J dictates that, in connection with handling payment orders sent through the Fedwire Funds Service, the Reserve Banks may not be liable for damages except those payable under Article 4A, which limits Reserve Bank liability to only direct Fedwire Funds Service participants, except in limited circumstances. The limited circumstances in which a Reserve Bank may be liable to an indirect participant are those in which a Reserve Bank executes a payment order late or improperly. In such cases, Article 4A limits damages payable to the Reserve Banks' indirect participants to interest and, in some circumstances, incidental expenses incurred in connection with late or improper execution of the payment order.[162] Under Article 4A, consequential damages are not recoverable for these errors by any party unless a receiving bank expressly agrees to be liable for them.[163] Under Regulation J, the Reserve Banks are not permitted to agree to be liable for these consequential damages.[164]

Although Operating Circular 6 is binding on indirect participants in some circumstances, the only obligations Reserve Banks have under Operating Circular 6 are those owed to direct Fedwire Funds Service participants.[165] This approach is consistent with the intent of Article 4A, which is to provide the foundation for funds transfers primarily by allocating rights and obligations between parties to a funds transfer that are in contractual privity.

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[161] As stated in footnote 80, the ARB generally oversees the administration of Federal Reserve credit, reserves, and risk-management policies for a financial institution's operations nationwide.

[162] UCC § 4A-305(a)-(c).

[163] UCC § 4A-305(c)-(d).

[164] 12 CFR § 210.32(a).

[165] Operating Circular 6 is applicable to indirect participants to the same extent as Regulation J, which is applicable to indirect participants to the same extent that a funds-transfer system rule is under Article 4A. 12 CFR § 210.25(b)(2)(v).

For more detail on the legal framework of the Fedwire Funds Service, see Principle 1, *Legal basis*.

19.4 An FMI should regularly review risks arising from tiered participation arrangements and should take mitigating action when appropriate.

The WPO has procedures in place to review its assessment of the risks posed to the Service from tiered participation at least biennially.

Principle 20: FMI links
An FMI that establishes a link with one or more FMIs should identify, monitor, and manage link-related risks.

This principle is not applicable to the Fedwire Funds Service.

Principle 21: Efficiency and effectiveness
An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.

21.1 An FMI should be designed to meet the needs of its participants and the markets it serves, in particular, with regard to choice of a clearing and settlement arrangement; operating structure; scope of products cleared, settled, or recorded; and use of technology and procedures.

The Reserve Banks provide the Fedwire Funds Service in accordance with guidelines established by the Board of Governors on the provision of Reserve Bank financial services and pricing, including those set out in the *Federal Reserve System Guidelines for the Provision of Financial Services*. Under those guidelines, the Reserve Banks are expected to (i) maintain an operational presence in the provision of financial services where that presence, as a result of cost advantages, would contribute to economic efficiency or where other public-interest considerations might dictate; (ii) be prepared to remove themselves from the provision of those services that the private sector can supply more efficiently, unless there are overriding public-interest reasons for the Reserve Banks to continue offering such services; (iii) maintain the flexibility to change existing services or to offer new ones to meet specialized or evolving needs of financial institutions and the public; (iv) ascertain the needs of financial institutions and the public in order to enhance their service offerings; (v) encourage innovation across financial services; and (vi) provide full information to financial institutions about the nature and scope of the services they offer.[166] To meet these expectations, the Reserve Banks designed and operate the Fedwire Funds Service to efficiently and effectively meet its participants' needs by providing a high-quality and practical funds transfer service.

User Consultations on Products and Services

FRBNY, through the WPO, is responsible for the day-to-day management of the Fedwire Funds Service. The WPO actively seeks participant feedback and assesses market needs through various user consultation channels when it considers enhancements to aspects of the existing Fedwire Funds Service or the development of new products or services for the Service.

External Stakeholders

FRBNY sponsors the Wholesale Payments Advisory Group (WPAG) to provide a mechanism for ongoing communication and collaboration between the WPO and a representative sample of depository institutions that are major users of the Service. The WPAG is chaired by the FRBNY officer in charge of the Fedwire Funds Service. It typically meets four times a year and serves as a forum that enables the WPO and Service participants to discuss ongoing operation and use of the Service, future service enhancements, needs for market standards (e.g., market conventions for using the Service), and relevant legal or regulatory developments. FRBNY also sponsors the Payments Risk Committee (PRC). The PRC's objectives are to (1) foster enhancements to the safety and efficiency of financial market infrastructure in the United States, including by identifying opportunities to strengthen the clearing and settlement of financial transactions and (2) keep the Federal Reserve informed about developments, conditions and practices in payments, clearing, and settlement activities. Both the WPAG and the PRC provide

[166] *See* Federal Reserve System Guidelines for the Provision of Financial Services, *supra* note 44, at 9–1573.

a forum for the WPO to disseminate information to, and collect information from, key Fedwire Funds Service participants during a major contingency event.

The Reserve Banks, through the WPO and the CRSO, seek to improve the efficiency and effectiveness of the Fedwire Funds Service by periodically seeking input on specific topics by interviewing and surveying customers, and by meeting with customers or industry trade groups in other forums besides the WPAG. The WPO leverages feedback from these external sources to assess Fedwire Funds Service participants' business needs and demand for new features and services and to help ensure it remains well informed, more generally, of the business environment and industry trends that may affect the Fedwire Funds Service.

In addition to the informal and user-group consultation processes outlined above, the Board of Governors uses appropriate procedures to obtain information and analysis from the public regarding proposed rules, regulations, policies, and changes to the Fedwire Funds Service that would have a significant longer-run effect on the nation's payments system.[167] Promulgation of Board rules is subject to the public notice and comment provisions of the Administrative Procedure Act. Generally, the Administrative Procedure Act requires that each federal agency provide notice to the public of a proposed rulemaking and an opportunity for the public to comment on the proposed rulemaking before it becomes effective. The notice of a proposed rulemaking must be published in the Federal Register. In addition, the Board of Governors may seek public comment on certain policy issues that are not necessarily rules under the Administrative Procedure Act.

Internal Stakeholders

The WPO also works with a number of Federal Reserve bodies to review the performance of the Fedwire Funds Service. This includes regular reporting to the FSPC, which is responsible for providing overall direction of the Reserve Banks' financial services, as well as related support functions, and for providing leadership for the evolving U.S. payments system. In addition, the WPO meets regularly with other Federal Reserve groups that consist of members from wholesale operation sites, the technical operations and testing staff responsible for monitoring the applications that run the Service, as well as liaisons from the Board of Governors, National IT, the CRSO, and Reserve Bank legal, audit, and risk functions.

Leveraging Stakeholder Input

The WPO uses the information collected through internal and external stakeholders to ensure the Fedwire Funds Service remains responsive to the needs of its participants. For example, in 2009 and 2011, based on participant feedback, the Service message format was enhanced to allow greater transparency of originator and beneficiary information for cover payments. In November 2014, the Reserve Banks modernized the technology underpinning the Service. The architecture of the modernized platform helps ensure the Service will retain the flexibility to meet current and future needs of Service customers. Since 2018, the WPO has worked with SWIFT and Fedwire Funds Service participants to establish and refine a market practice to support the identification of SWIFT gpi payments in the Fedwire Funds Service message format.

[167] *See* Principles for Pricing of Federal Reserve Bank Services, *supra* note 74, at 9–1568 (principle 7).

Pricing and Cost Efficiency

Fedwire Funds Service fees are set and structured to meet its cost-recovery mandate while providing customers with price efficiencies through a tiered pricing based on a mix of service and volume utilization. In establishing and approving fees for the Service, the Reserve Banks and the Board of Governors adhere to the previously mentioned principles for the pricing of Reserve Bank services and the Monetary Control Act.[168] The Board of Governors, which considers the objectives of fostering competition, improving the efficiency of the payment system, and lowering costs of these services to society at large, has required the Reserve Banks to establish their fees for services like the Fedwire Funds Service in such a way that, over the long run, the Reserve Banks will recover all the direct and indirect costs they incur in providing the services, as well as imputed costs, including financing costs, taxes, and certain other expenses, plus a return on equity (i.e., profit) that a private business firm would have expected to earn if it had provided the services.[169]

The WPO focuses on controlling costs and closely scrutinizes projected and actual costs as part of the annual budgeting process for the Fedwire Funds Service. Over the course of the year, the WPO actively monitors cost-recovery performance, including the underlying revenue and cost statistics, on a monthly basis against budgeted performance and leads an annual repricing exercise to determine whether changes in prices for the Service for the following year will be necessary to ensure cost recovery over the long run.

The fee schedule for the Fedwire Funds Service aims to align revenues with the cost of providing the Service, which is characterized by high fixed costs and low marginal costs. Service participants pay per-item transaction fees for originating and receiving transfers, but the transaction fee is tiered to provide participants volume-based discounts, as well as other incentives under certain conditions. The fee schedule also includes a monthly participation fee and surcharges based on time-of-day and value thresholds. Participants that use the offline telephone service to send and receive their Service transactions are assessed a surcharge that reflects the additional cost of handling offline transfers, which require manual processing on the part of the Reserve Banks. Finally, the Reserve Banks charge connection fees to Service participants that access the Service via an electronic access solution to recover costs related to the secure communications infrastructure. Connections are priced by line speed and access solution type.

Fedwire Funds Service prices are publicly available at FRBservices.org, along with other Reserve Bank financial services prices, and prices for access solutions and à la carte services. FRBservices.org clearly breaks down prices by service offering. Prices for Reserve Bank financial services, including those for the Fedwire Funds Service, are reevaluated on an annual basis. If circumstances warrant, the Reserve Banks may implement price changes, including for the Service, at other times (subject to approval by the Board of Governors). The Board publishes in the Federal Register and on its website a detailed disclosure relating to all price changes.[170] For more detail on the repricing process, see Principle 15, *General business risk.*

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[168] *See id.* at 9–1566 to –1568.

[169] *See, e.g.*, Board of Governors of the Federal Reserve System, Federal Reserve Bank Services, 85 Fed. Reg. 73037 (Nov. 16, 2020).

[170] *See, e.g., id.*

21.2 An FMI should have clearly defined goals and objectives that are measurable and achievable, such as in the areas of minimum service levels, risk-management expectations, and business priorities.

The WPO develops business objectives as part of its annual planning process. The business objectives represent the primary drivers of resource usage or significant strategic initiatives in the wholesale business and the Reserve Banks' annual strategic goals for the financial services they offer. Every year, the WPO seeks input from the FSPC about the WPO's business objectives. Under the COP's strategic direction, the FSPC establishes the overall direction for financial services and related support functions for the Reserve Banks and provides leadership for the evolving U.S. payments system. For more detail, see Principle 2, *Governance.* In conjunction with the annual planning process, the WPO works with the wholesale operations sites to define a set of deliverables for the coming year. These deliverables are defined in support of the WPO business objectives and are monitored through to completion with a progress report provided on a periodic basis. A self-evaluation process and performance conversation occurs with the operations sites on these deliverables at the end of each year.

Separately, the WPO's business objectives align to objectives established by FRBNY as part of its annual strategic planning, resourcing, and evaluation process. The financial resources requested to support the WPO's business objectives are reviewed as part of the annual budget by several FRBNY bodies, including the executive committee and FRBNY's board of directors, and submitted as part of the FRBNY consolidated budget for approval by the Board of Governors. Where relevant, the WPO also submits quarterly performance reporting to FRBNY's strategic planning office, which aggregates the information and reports accomplishments, issues, and risks to FRBNY senior management. FRBNY's strategic planning office leverages these inputs to inform FRBNY's self-evaluation of its overall performance as a Reserve Bank, which is submitted to the Board of Governors each year.

The WPO separately measures the efficiency of the Fedwire Funds Service by monitoring the availability of the suite of applications that support the Service. For more detail on the availability metrics for the Fedwire Funds Service, see section 17.3.

21.3 An FMI should have established mechanisms for the regular review of its efficiency and effectiveness.

The WPO relies on a range of processes and metrics to assess the efficiency and effectiveness of the Fedwire Funds Service. To assess efficiency, the WPO prepares monthly reports to monitor cost-recovery performance against its budget for the Service and to document explanations for any variances. In addition, the WPO's quarterly performance report, which is sent to the FSPC's support office and wholesale services contacts at the other 11 Reserve Banks, includes metrics on cost-recovery performance, volume and value fluctuations, and market share, as well as business drivers that explain the observed changes.

The WPO provides quarterly progress reports to each of the Reserve Banks' designated wholesale contacts and to the FSPC's support office, which include the availability metrics described in section 17.3. The FSPC's support office assists the FSPC in monitoring the progress of Reserve Bank product offices, like the WPO, and coordinating a self-assessment process across all Reserve Bank product offices against their business objectives and other evaluation criteria. The WPO's self-assessment is an input in the evaluation by the other 11 Reserve Banks of FRBNY's performance in operating the Fedwire Funds Service. The FSPC also uses these inputs to evaluate whether FRBNY has achieved the business objectives established by the WPO and to evaluate the performance of the WPO's product director and product manager.

To assess the effectiveness of the Fedwire Funds Service, the Reserve Banks collect feedback from Service customers on the performance of the Service in meeting their needs through the user consultations described in section 21.1.

Principle 22: Communication procedures and standards
An FMI should use, or at a minimum accommodate, relevant internationally accepted communication procedures and standards in order to facilitate efficient payment, clearing, settlement, and recording.

22.1 An FMI should use, or at a minimum accommodate, internationally accepted communication procedures and standards.

The Fedwire Funds Service accommodates internationally accepted communication procedures and standards. The Fedwire Funds Service is a funds-transfer system that processes funds-transfer messages between Service participants in the United States[171] using a proprietary format that is documented and communicated to participants. The proprietary message format contains basic messaging functions and is compatible with other formats used for funds-transfer payment and messaging systems. Thus, funds transfers sent through the Service may be routed to or from another system or jurisdiction. Specifically, participants can translate the Fedwire message format to the proprietary message format used by the CHIPS funds-transfer system operated by The Clearing House Payments Company L.L.C., as well as the SWIFT format. To conduct cross-border funds transfers, depository institutions typically translate Fedwire messages to SWIFT format.[172] Basic functions enabled by the Fedwire Funds Service message format include, but are not limited to, bank transfers, customer transfers, balance inquiries, advices, acknowledgments, requests for reversals, and requests for information. The message format includes fields to identify parties to the funds transfer (even beyond to the Fedwire sender and receiver), to provide bank-to-bank information, and to provide originator-to-beneficiary information.

The WPO participates in relevant payments industry standards groups, such as the SWIFT Payments Maintenance Work Group and the ISO 20022 Payments Standards Evaluation Group, to maintain awareness about changes to existing standards and the development of future standards.[173]

In 2013, a stakeholder group in the United States, which included FRBNY, engaged an independent consultant to consider the business case for or against adopting ISO 20022 payment messages for U.S.-based payment clearing and settlement infrastructure providers, financial institutions, and their corporate customers.[174] The study concluded in 2014 that there might be nonfinancial, strategic reasons to adopt the ISO 20022 messaging standard in the United States.

Through extensive industry engagement, the WPO developed a multiyear strategy to adopt the ISO 20022 payment messages for the Fedwire Funds Service. In 2019, the Reserve Banks received a formal request from the Payments Market Practice Group, global payments industry

[171] As stated in footnote 28, there are limited exceptions in which a participant may access the Service from outside the United States.

[172] Routing numbers, which are broadly used to identify financial institutions in the United States, can be converted to and from the global Business Identifier Code standard through a simple lookup.

[173] The ISO 20022 XML messages are based on the Universal Financial Industry standard.

[174] The other members of the stakeholder group are The Clearing House Payments Company L.L.C., NACHA—The Electronic Payments Association, and Accredited Standards Committee X9–Financial Industry Standards, Inc.

experts that develop market practices along with correct use of standards, to reconsider the phased ISO 20022 migration strategy in favor of a single-day implementation to fully enhanced ISO 20022 messages.[175] As a result of this industry request, the Board of Governors issued a Federal Register Notice in October 2021 to seek input on the revised implementation strategy in favor of single-day implementation. The Reserve Banks created a dedicated website for the latest information about the ISO 20022 implementation for the Fedwire Funds Service.[176]

See *System Design and Operations* in section III for a brief description of the solutions that participants can use to access the Fedwire Funds Service.

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[175] Payments Market Practice Group, *available at* https://www.swift.com/about-us/community/swift-advisory-groups/payments-market-practice-group.

[176] Fedwire Funds Service ISO 20022 Implementation Center, *available at* https://www.frbservices.org/resources/financial-services/wires/iso-20022-implementation-center.html.

Principle 23: Disclosure of rules, key procedures, and market data
An FMI should have clear and comprehensive rules and procedures and should provide sufficient information to enable participants to have an accurate understanding of the risks, fees, and other material costs they incur by participating in the FMI. All relevant rules and key procedures should be publicly disclosed.

23.1 An FMI should adopt clear and comprehensive rules and procedures that are fully disclosed to participants. Relevant rules and key procedures should also be publicly disclosed.

The Reserve Banks provide Fedwire Funds Service participants with comprehensive rules and procedures and make key rules and procedures accessible to participants and the general public from the Reserve Banks' financial services website, FRBservices.org. Moreover, the Board of Governors' Regulation J, which also governs funds transfers made through the Service, is published in the Code of Federal Regulations and is accessible from the Board's website. As noted in section 1.2, the Reserve Banks and the Board of Governors take a number of steps that help ensure the rules and procedures governing the Service are clear and understandable.

23.2 An FMI should disclose clear descriptions of the system's design and operations, as well as the FMI's and participants' rights and obligations, so that participants can assess the risks they would incur by participating in the FMI.

The respective rights and obligations of the Reserve Banks, as operator of the Fedwire Funds Service, and of Fedwire Funds Service participants are set forth in applicable Reserve Bank operating circulars and in the statutes and regulations applicable to the Service, all of which are publicly accessible through the Internet. For more detail on the specific rights and obligations established through the legal framework applicable to the Fedwire Funds Service, see Principle 1, *Legal basis*.

Clear descriptions of the design and operations of the Fedwire Funds Service also are publicly available to participants and the general public through the Internet. In particular, an overview of the Fedwire Funds Service is available at FRBservices.org, which sets forth a description of the structure of the Service, product offerings and pricing, hours of operation, and relevant contact information. The same website provides links to instructions for customers wishing to become participants, as well as for existing participants that wish to modify the services they currently use.

When a new customer requests an electronic connection to the Fedwire Funds Service, the customer is provided additional documentation regarding the technical specifications required for connectivity. Operating Circular 5, which sets forth the rights and obligations of Reserve Bank customers with respect to electronic access to any Reserve Bank services, including the Fedwire Funds Service, also incorporates, or is supplemented by, additional documentation, including the Reserve Banks' certification practice statements and password practice statement.[177] Operating Circular 5 and these practice statements are available at FRBservices.org.

[177] The certification practice statements describe the policies and practices of the Reserve Banks' public key infrastructure with respect to the issuance, management, and usage of digital certificates and set forth the obligations of certificate users. The password practice statement describes the policies and

23.3 An FMI should provide all necessary and appropriate documentation and training to facilitate participants' understanding of the FMI's rules and procedures and the risks they face from participating in the FMI.

Fedwire Funds Service communication, training, and testing opportunities are designed to improve participants' understanding of rules and procedures and risks related to participation. The Reserve Banks communicate with participants as needed regarding changes to the Fedwire Funds Service, including changes to the fee schedule for the Service.[178] The Reserve Banks also regularly provide Fedwire Funds Service participants with training and testing opportunities. Detailed instructions regarding training, testing, and educational opportunities can also be found at FRBservices.org.

The Reserve Banks routinely seek feedback from customers regarding the effectiveness of their communications through, for example, customer advisory group meetings and customer satisfaction surveys. For questions about the Fedwire Funds Service, participants may contact their account executives, the customer contact centers, the wholesale testing units, or the wholesale operations sites for assistance. Contact numbers are available at FRBservices.org.

If a participant does not follow applicable operating circulars or other governing rules, policies (including the PSR policy), or procedures, a Reserve Bank may take certain remedial actions to protect itself or other participants. For more detail on the remedial actions a Reserve Bank may take, see Regulation J, Operating Circular 1, Operating Circular 6, the PSR policy, and Principle 4, *Credit risk*.

23.4 An FMI should publicly disclose its fees at the level of individual services it offers as well as its policies on any available discounts. The FMI should provide clear descriptions of priced services for comparability purposes.

The prices for using the Fedwire Funds Service are publicly available at FRBservices.org, along with prices for other Reserve Bank financial services, and prices for access solutions and à la carte services. FRBservices.org clearly breaks down prices by service offering and indicates where discounts are available (e.g., for higher transaction volumes) and where surcharges may apply (e.g., for offline funds transfers or for late-in-the-day funds transfers).[179]

Prices for Reserve Bank financial services, including those for the Fedwire Funds Service, are reevaluated on an annual basis. Price changes typically are announced in the fourth quarter of every year before they take effect in January of the following year. If circumstances warrant, the Reserve Banks may implement price changes, including for the Service, at other times (subject to approval by the Board of Governors). The Board of Governors publishes in the Federal Register a detailed disclosure relating to all price changes.[180] For more detail on the process of

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practices of the Reserve Banks with respect to Reserve Bank–issued passwords used to access Reserve Bank applications.

[178] As described above, the Board of Governors also communicates with participants and the public at large regarding significant changes in Reserve Bank fees or service arrangements.

[179] Information about the Federal Reserve Financial Services fees is *available at* https://www.frbservices.org/resources/fees/index.html.

[180] *See, e.g.*, Board of Governors of the Federal Reserve System, Federal Reserve Bank Services, 85 Fed. Reg. 73037 (Nov. 16, 2020).

reevaluating the prices for using the Service, see Principle 15, *General business risk*, and Principle 21, *Efficiency and effectiveness*.

23.5 An FMI should complete regularly and disclose publicly responses to the CPSS-IOSCO disclosure framework for financial market infrastructures. An FMI also should, at a minimum, disclose basic data on transaction volumes and values.

Value and volume statistics related to the Fedwire Funds Service are available at FRBservices.org and present monthly, quarterly, and annual data.[181] The Board of Governors' website presents statistics on daylight overdrafts incurred by master account holders.[182]

The Reserve Banks will update this disclosure following changes to the Fedwire Funds Service or the environment in which it operates that would significantly affect the accuracy of the statements in this disclosure. At a minimum, they will review and update this disclosure every two years.

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[181] *See* Federal Reserve Banks, Fedwire Funds Service Volume and Value Statistics, *available at* https://www.frbservices.org/resources/financial-services/wires/volume-value-stats/.

[182] *See* Board of Governors of the Federal Reserve System, Payment System Risk: Daylight Overdrafts and Fees, *available at* http://www.federalreserve.gov/paymentsystems/psr_data.htm.

Principle 24: Disclosure of market data by trade repositories
A TR should provide timely and accurate data to relevant authorities and the public in line with their respective needs.

This principle is not applicable to the Fedwire Funds Service.

V. Acronyms

ARB	Administrative Reserve Bank
CCP	central counterparty
CFR	Code of Federal Regulations
CFVP	Conference of First Vice Presidents
CHIPS	Clearing House Interbank Payments System
COP	Conference of Presidents
CPMI	Committee on Payments and Market Infrastructures
CPSS	Committee on Payment and Settlement Systems
CRSO	Customer Relations and Support Office
CSD	central securities depository
DNS	deferred net settlement
ET	Eastern Time
FMI	financial market infrastructure
FRBNY	Federal Reserve Bank of New York
FRFS	Federal Reserve Financial Services
FSPC	Financial Services Policy Committee
GAO	U.S. Government Accountability Office
HR	human resources
IOSCO	International Organization of Securities Commissions
ISO	International Organization for Standardization
IT	information technology
ITOC	Information Technology Oversight Committee
LVPS	large-value payment system
PFMI	Principles for Financial Market Infrastructures
PRC	Payments Risk Committee

PSR	payment system risk
RTGS	real-time gross settlement
SAFR	Security Assurance for the Federal Reserve
SSS	securities settlement system
SWIFT	Society for Worldwide Interbank Financial Telecommunications
TR	trade repository
UCC	Uniform Commercial Code
ULC	Uniform Law Commission
USC	United States Code
WPAG	Wholesale Payments Advisory Group
WPO	Wholesale Product Office

VI. List of Publicly Available Resources

General Information

Fedwire Funds Service
https://www.frbservices.org/financial-services/wires/index.html

Operating Circulars, Policies, and Guides

Reserve Bank operating circulars
https://www.frbservices.org/resources/rules-regulations/operating-circulars.html

Federal Reserve Policy on Payment System Risk
http://www.federalreserve.gov/paymentsystems/files/psr_policy.pdf

PSR-related policies
http://www.federalreserve.gov/paymentsystems/psr_relpolicies.htm

Federal Reserve's Key Policies for the Provision of Financial Services
http://www.federalreserve.gov/paymentsystems/pfs_policies.htm

Supervision and Oversight of Financial Market Infrastructures (Reserve Bank Systems)
http://www.federalreserve.gov/paymentsystems/over_rbsystems.htm

Federal Reserve Collateral Guidelines
https://www.frbdiscountwindow.org/pages/collateral/discount%20window%20margins%20and%20collateral%20guidelines

Account Management Guide
https://www.frbservices.org/assets/resources/rules-regulations/account-management-guide.pdf

Financial Accounting Manual for Federal Reserve Banks
http://www.federalreserve.gov/monetarypolicy/files/BSTfinaccountingmanual.pdf

Data

Monthly, Quarterly, and Annual Fedwire Funds Service Value and Volume Statistics
https://www.frbservices.org/resources/financial-services/wires/volume-value-stats/index.html

Other

The Federal Reserve System: Fed Explained
https://www.federalreserve.gov/aboutthefed/the-fed-explained.htm

Information on FRBNY's governance
http://www.newyorkfed.org/aboutthefed/governance.html

FRBNY's code of conduct
https://www.newyorkfed.org/medialibrary/media/aboutthefed/ob43.pdf

CPMI-IOSCO Guidance on Cyber Resilience for Financial Market Infrastructures http://www.bis.org/cpmi/publ/d146.pdf