



BANCO DE MÉXICO

Interbank Electronic Payment System (SPEI)

Principles for Financial Market Infrastructures Disclosure

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INTERBANK ELECTRONIC PAYMENT SYSTEM (SPEI – SISTEMA DE PAGOS ELECTRÓNICOS INTERBANCARIOS)

Responding institution: Interbank Electronic Payment System (SPEI).

Jurisdiction in which the FMI operates: Mexico.

Authority regulating, supervising or overseeing the FMI: Banco de México.

The date of this disclosure is: March 28th, 2016.

This disclosure can also be found at the following [link](#).

For further information, please visit [Banco de México's Internet-based services module](#).

I. Executive summary

The *principles for financial market infrastructures* (PFMI) published in April 2012 by the Committee on Payment and Settlement Systems¹ (CPSS) and the International Organization of Securities Commissions (IOSCO), represent the new international standards that apply to systems that facilitate clearing, settlement or recording of monetary, securities, derivatives and other financial transactions.

The PFMI's objective is to ensure that financial market infrastructures are secure and efficient, operating adequately even under stress conditions. These principles apply, among other infrastructures, to systemically important payment systems and, in particular, replace the *Core principles for systemically important payment systems* published in 2001.

The purpose of this document is to inform the general public of Banco de México's approach in the adoption of the PFMI in regards to the Interbank Electronic Payment System (SPEI). SPEI's general characteristics and the most relevant aspects of the PFMI's fulfillment are described in section III and IV of this document², and are summarized according to the following grouping: general organization (PFMI 1 to 3), credit and liquidity risk management (PFMI 4 to 7), settlement (PFMI 8 to 10), general business and operational risk management (PFMI 15 to 17), access (PFMI 18 to 20), efficiency (PFMI 21 to 22), and transparency (PFMI 23 to 24)³.

¹ As of September 2014, the Committee on Payments and Market Infrastructures (CPMI) of the Bank of International Settlements.

² The structure of this document is based on the disclosure framework published in December 2012 by the CPSS-IOSCO.

³ Some PFMI are not listed as they do not apply to payment systems, or in particular to SPEI, according to its characteristics.

General organization

SPEI is an electronic funds transfer system owned and operated by Banco de México, Mexico's central bank. This system was developed to facilitate payments between financial institutions, in addition to enabling them to offer safe and efficient retail payment services to the public.

SPEI's participants can transfer Mexican pesos by own account and on behalf of their accountholders, in near real-time, 24 hours per day, every day of the year.

At the core of the legal framework in which SPEI operates is the Payments Systems Law⁴ which establishes that the settlement of transfer orders that takes place through the clearing process of the system is final, irrevocable, enforceable, and binding before third parties, which ensures the finality of the operations.

SPEI's governance arrangements are subject to Banco de México's regulatory framework and policies. These framework and policies contain the objectives and functions of the institution, its organizational structure, Banco de Mexico's Governor and the Board of Governors responsibilities, as well as those of the administrative units that report to them, and the accountability mechanisms, among some of the aspects relevant to the operation of SPEI.

Credit and liquidity risk management

In order to mitigate credit and liquidity risks, SPEI was designed so that its operations are settled in near real-time with the resources kept in the system, it does not extend credit nor overdrafts its participant's accounts; transfers that do not have enough liquidity to be processed are queued until they can be processed. On the other hand, Banco de México provides liquidity to settle payment systems operations through mechanisms that produce limited risks ensuring that institutions have enough resources to fulfill their obligations and those instructed by their customers, in a timely manner.

Settlement

The system settles payments with central bank money⁵ from the cash accounts participants held in the system, which means that the financial risks it generates are not relevant. SPEI cancels all transfer orders that have not been settled by the operational day change in order to avoid the accumulation of financial obligations from different operational days.

⁴ The list of agreements or procedures considered as Payments Systems subject to the provisions of the Payments System Law and the entities that administrate them can be found at the following [link](#) (available in Spanish).

⁵ For the purpose of this report, central bank money should be understood as the resources that financial institutions have in cash accounts held at Banco de México.

General business and operational risk management

In regard to general business risk, Banco de México maintains a fund capable of meeting at least 18 months' worth of payments to suppliers in the event that these cannot be covered by revenues from fees charged to the system's participants. This means that the risk that SPEI cannot operate due to a lack of resources is limited.

As for operational risk, SPEI is supported by a framework for the comprehensive management of risks that defines roles and responsibilities for the identification and management of risks, their assessment, and the establishment of its risk's tolerance policy, the basis on which to determine if controls are required to mitigate risks. Business continuity measures, considered within the aforementioned framework, are in place to face various risk scenarios, these measures include a redundant infrastructure, an alternate operation site, a remote operation scheme, as well as contingency operation procedures that allow for a quick recovery of the system, even in a major event that impacts normal operation. In regards to information security risks, SPEI has implemented different procedures and tools to monitor the system's activity. Moreover, all communications are encrypted, and payment instructions and settlement notices include digital signatures.

Access

Only financial institutions regulated and supervised by Mexican financial authorities are eligible to participate in SPEI to limit risks that participants generate. These institutions must comply with technical, information security and operational risk management requirements, prior to joining the system. The access requirements are essentially the same for all participants, thus ensuring equal treatment for entry to the system.

Fees that participants pay are determined by the infrastructure they require to connect with Banco de México and by the ratio of operations instructed by the participant to the total number of operations processed in the system. Banco de México establishes SPEI's fees based on a cost recovery policy, the costs are low and do not represent a barrier to participate in the system.

Efficiency

SPEI was developed with the goal of facilitating its participants' automated connection in order to reduce operational risks that could arise when executing operations manually. Communication between SPEI and its participants is based on an open protocol developed by Banco de México, available to participants and potential participants, which allows an efficient exchange of information and includes security controls to authenticate the participant that sends instructions. Although SPEI's protocol is not an international standard, such a standard has not been considered necessary and participants have not shown an interest in adopting one.

Transparency

SPEI's main characteristics, including its general operation, its main rules for access and operation, a description of the method used to determine the system's fees and its main statistics in regards to the operation are available on Banco de México's website⁶. Additionally, mechanisms are in place through which SPEI's participants and the general public can contact Banco de México if they require any more information.

II. Summary of major changes since the last update of the disclosure

This is SPEI's first disclosure document for the PFMI.

III. General background

A. General description and the markets it serves

SPEI is an electronic funds transfer system owned and operated by Banco de México. This system became operational in August 2004 and gradually replaced its predecessor, the Extended-use Electronic Payments System (known by its Spanish acronym, SPEUA), which ceased operations in August 2005.

SPEI was developed to facilitate payments between financial institutions and to enable them to offer safe, efficient, and near real-time payment services.

Legal and natural persons can transfer resources through SPEI by instructing payment orders to the bank that manages their account. Banks that offer this service receive instructions from their customers from various channels such as Internet websites, mobile banking applications, SMS⁷ messages and bank's branches.

Entities that are eligible to participate in SPEI are regulated financial institutions, clearing houses authorized by Banco de México in terms of the Law for Transparency and Regulation of Financial Services, and other entities regulated and overseen by Banco de México, the National Banking and Securities Commission (known by its Spanish acronym, CNBV), the National Savings System for Retirement (known by its Spanish acronym, CONSAR), or the National Insurance and Bonding Commission (known by its Spanish acronym, CNSF), as well as any other entity authorized by Banco de México. At the end of 2015, there were 52 banks and 55 non-bank financial institutions, which use the system to make payments related to their own operation; additionally, some of them, such as banks and popular financial corporations, also use it to offer payment services to their customers.

⁶ Additional information on SPEI can be found at the following [link](#) (available in Spanish).

⁷ Short Message Service.

SPEI settles most of the financial markets operations in Mexico, as well as low-value payments made by the general population.

As for the foreign exchange market, SPEI only settles operations in Mexican pesos, including net peso positions from the international currency settlement system operated by the CLS Bank, a participant in the system, as well as other exchange transactions among banks.

Regarding the operations of the debt and capital markets, the central securities depository (known by its Spanish acronym, INDEVAL), settles stock market and bond market operations through its own securities settlement system (known by its Spanish acronym as DALI). To settle these operations, the INDEVAL, which participates in the SPEI, holds accounts for its participants, whose balances are backed by the balance of DALI in SPEI.

B. Basic data and statistical parameters

SPEI's participants can transfer Mexican pesos to any other participant. The system processes 15 types of payment⁸, but the most relevant types are from a participant to another (usually high value payments to settle obligations between financial institutions) called participant to participant and participants' customers' payments to other participants' customers (mainly low-value payments, but also include payments from companies' treasuries), called third party to third party payments. Not all participants use every type of payment, since accepting some of them is optional.

The number of transfers processed by SPEI has increased at an annual average rate of 32 percent over the past five years. An important contribution to this growth comes from the increasing number of payment orders sent by the Federal Treasury (known by its Spanish acronym, TESOFE)⁹. These payments include payrolls, pensions and payments to suppliers. During 2015, SPEI processed 335 million operations, with an approximate value of 245 trillion pesos.

⁸ The type of payments that participants can operate through SPEI are: returns*, third party to third party*, third party to branch, third party to third party vostro*, third party to participant, participant to third party, participant to third party vostro*, participant to participant*, third party to third party FSW, third party to third party vostro FSW, participant to third party vostro FSW*, invoice payment, and extemporaneous return* (it is mandatory to receive types of payment marked with an asterisk).

⁹ TESOFE is the administrative unit of the Ministry of Finance responsible for the financial management of the resources and securities of the Federal Government, including the receipt of revenues and budgetary payments, among others.

Figure 1. Evolution of payments processed through SPEI

	Third Party Payments		Participant to Participant		Payrolls		Others		Total	
	Count	Amount (millions)	Count	Amount (millions)	Count	Amount (millions)	Count	Amount (millions)	Count	Amount (millions)
2006	17,025,867	26,781,641	291,296	24,713,737	0	0	1,808,952	65,253,413	19,126,115	116,748,791
2007	25,856,115	29,469,811	348,159	27,636,461	0	0	3,266,646	78,288,766	29,470,920	135,395,038
2008	36,225,371	36,286,667	403,967	29,173,666	510,536	893	4,568,641	78,995,492	41,708,515	144,456,719
2009	49,562,023	44,473,671	360,570	31,833,550	8,306,050	40,950	3,984,628	52,157,919	62,213,271	128,506,090
2010	67,781,468	57,204,689	391,544	35,906,815	12,976,313	83,345	4,704,871	59,900,875	85,854,196	153,095,724
2011	86,643,988	74,185,930	384,525	40,359,275	19,370,012	74,180	4,255,871	64,290,568	110,654,396	178,909,954
2012	109,375,271	77,782,805	356,353	47,168,322	56,583,065	251,242	5,423,163	73,986,853	171,737,852	199,189,222
2013	142,904,278	77,479,728	375,336	53,981,219	68,417,137	356,020	5,886,009	75,780,418	217,582,760	207,597,385
2014	175,451,534	81,333,958	413,496	70,411,448	80,360,389	417,986	6,669,534	71,206,493	262,894,953	223,369,885
2015	219,400,119	91,126,582	455,861	72,413,896	107,626,148	615,226	7,413,086	80,909,867	334,895,214	245,065,571

In 2015, SPEI was available 99.98 percent of the time, and the average time it took¹⁰ to settle a payment was 1.9 seconds.

C. General organization

Banco de México, the central bank of Mexico, is the owner, administrator, and regulator of SPEI. SPEI is aligned with the objectives stated in the Banco de México Law, among which are promoting the sound development of the financial system and fostering the proper functioning of the payment systems. In that sense, SPEI was developed to meet the needs of the domestic market, enabling financial institutions to make payments to each other and to offer safe, efficient, and near real-time payment services.

The substantive actions of Banco de México, as well as the important decisions in administrative matters, are the sole decision of the Governor and the Board of Governors, within their respective scopes of duty. In turn, the Board of Governors and the Governor are supported by the Directorates General and Directorates, which are part of the structure of Banco de México, along with various Committees.

The functions related to payment systems, including those related to SPEI, are assigned primarily to the Directorate General of Payment Systems and Corporate Services, and in particular to the Directorate of Payment Systems. The main attributions of this Directorate are: to design, elaborate and implement the policies for the development and proper functioning of payment systems; to design and develop the payment systems operated by Banco de México, and to keep them technologically updated; to manage and operate these systems to ensure business continuity, and to supervise their compliance with the payment systems' provisions.

Additionally, the governance structure of Banco de México for issues related to SPEI is supported by the Directorates General of Information Technology, Comptroller and Risk Management, and Legal

¹⁰ From the time SPEI received a payment instruction up to the time a settlement notice was sent.

Affairs, which report directly to the Governor, and the Directorate of Auditing, which reports to the Board of Governors¹¹.

The objectives and work plans related to SPEI lie within the framework of institutional planning, a process through which the priorities of the institution are defined, as well as the actions needed to achieve them. The institutional planning scheme includes defining medium-term priorities for the institution (five years planning horizon), which are endorsed by the Governor and reviewed by the Board of Governors. Additionally, in the context of budget approval, Banco de México conducts an annual planning process aligned with the medium-term priorities, in which the heads of administrative units submit their work plans for the consideration of the Governor. Once the work plans have been approved by the Governor, they are presented to the Board of Governors. Work plans describe the goals, objectives and projects of each administrative unit as well as the budgetary resources required to develop them, including those related to SPEI.

All major changes in SPEI are presented to the Governor and the Board of Governors for their consideration.

D. Legal and regulatory framework

SPEI is subject to the federal Payments Systems Law¹² and regulations issued by Banco de México, among them, Circular 17/2010 (SPEI Regulation), SPEI's Operational Manual, Contingency Manual for CEP (electronic proof of payment) and the Contingency Manual for operations with CLS Bank International (CLS Bank). Furthermore, entities that participate in SPEI enter into a contract with Banco de México which establishes the rights and obligations regarding the provision of services.

Banco de México's Law¹³, which regulates the central bank, contains several provisions with regards to payment systems, foremost among which are the following:

- The promotion of a sound development of the financial system and the proper functioning of payment systems are stated as purposes of Banco de México (Article 2).
- The functions of Banco de México include the regulation of payment systems (Article 3).
- The power conferred to Banco de México to issue provisions whose aim is to promote the sound development of the financial system, the proper functioning of payment systems, and protection of the public's interests (Article 24).
- The power conferred to Banco de México to regulate credit institutions' funds transfer services (Article 31).
- The power conferred to Banco de México to monitor financial intermediaries and financial entities subject to its regulation (Article 35 Bis).

¹¹ Banco de México Internal Regulation, where the attributions of the administrative units are established, is available at the following [link](#).

¹² Payments Systems Law's web [link](#).

¹³ Banco de México Law's web [link](#).

E. System design and operations

SPEI is a near real-time hybrid settlement system for payments. The frequency with which SPEI settles payments depends on the processes that it must execute. On average, payments are settled in 1.9 seconds, and the results are settled immediately in the participant's cash accounts in SPEI.

SPEI uses an open communication protocol that was specifically designed for SPEI and does not require a specific architecture, programming language or operating system. SPEI's participants have the protocol's full specifications, so they can develop their own system connectivity applications according to their needs. Operations held with CLS Bank are managed in SPEI through SWIFT¹⁴, so Banco de México translates the messages from SWIFT to SPEI protocol and vice versa.

SPEI does not extend credit to participants. Operations are settled with financial funds that each participant maintains in its respective account within the system; these accounts are denominated in national currency and do not allow overdrafts. At the start of operations, participants transfer funds from their Account Holders Service System (known by its Spanish acronym, SIAC)¹⁵ account to their SPEI account. At the end of the day, positive balances in SPEI are credited to banks' current accounts in SIAC or to a concentration account within the system for participants without a SIAC account. During the operating day, participants' accounts can be funded through transfers settled in their favor or through transfers between SIAC and SPEI. At the end of the day, SPEI cancels all payments that have not been settled.

Participants can classify transfer orders through SPEI as high priority. SPEI attempts to settle high priority payment orders first, providing access to the balance reserved for this purpose.

In order to process payments more efficiently, SPEI participants can group several payments into one "payment instruction". SPEI allows participants to exchange payment orders using two types of topologies, T and V. In topology V, the receiving participant gets information on transfer orders in their favor only when these have been settled. In topology T, the receiving participant gets payment instructions as payment intentions, and then receives information about the settlement of each order as it is settled.

SPEI performs various validations on payment instructions. When SPEI receives a payment instruction, it verifies the size and structure of the message and the validity of the digital signature. If the payment structure is correct and the signature of the issuing bank is valid, the payment orders in the instructions are ready to enter the settlement process, which identifies a set of payments that can be settled without overdrawing the issuing bank's balance. When the payment has been settled,

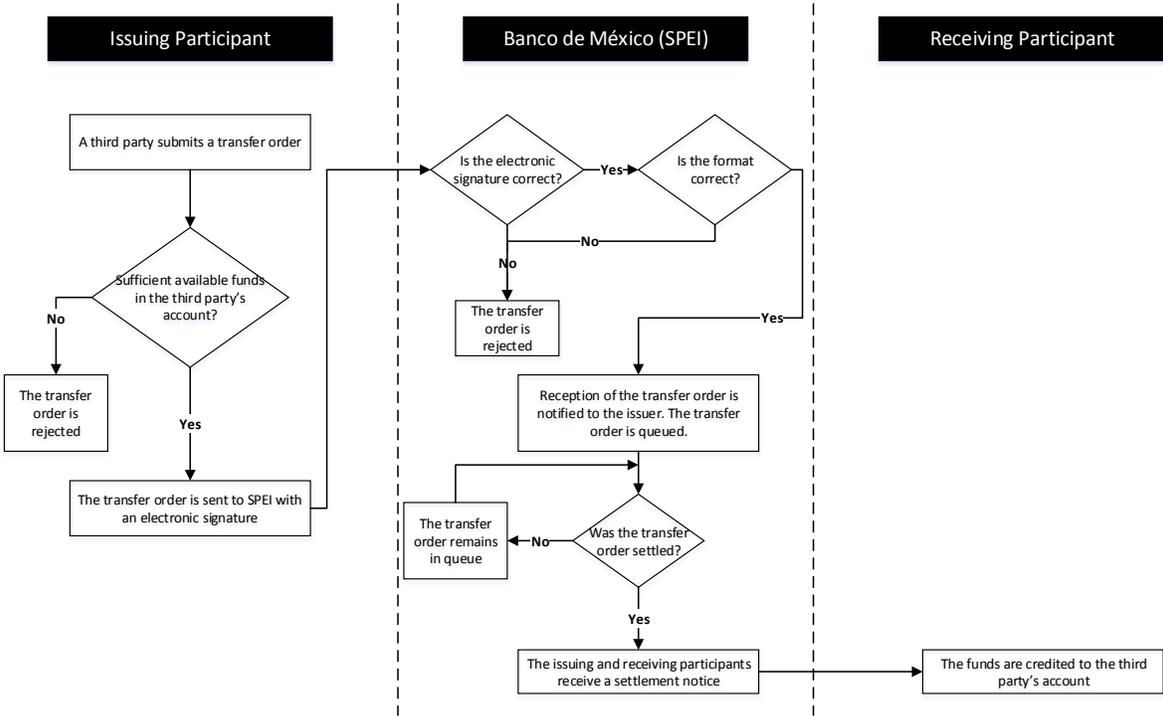
¹⁴ Society for Worldwide Interbank Financial Telecommunications.

¹⁵ SIAC is the system through which the central bank administers the current accounts of Banco de México's participants, used for the implementation of the monetary policy; Banco de México's participants include banks, brokerage firms, and other entities.

Banco de México generates, signs, and sends settlement notices to the receiving participants, who must credit the funds to the recipient costumers' accounts.

SPEI's payment processing flow from third party to third party used in topology V is summarized below.

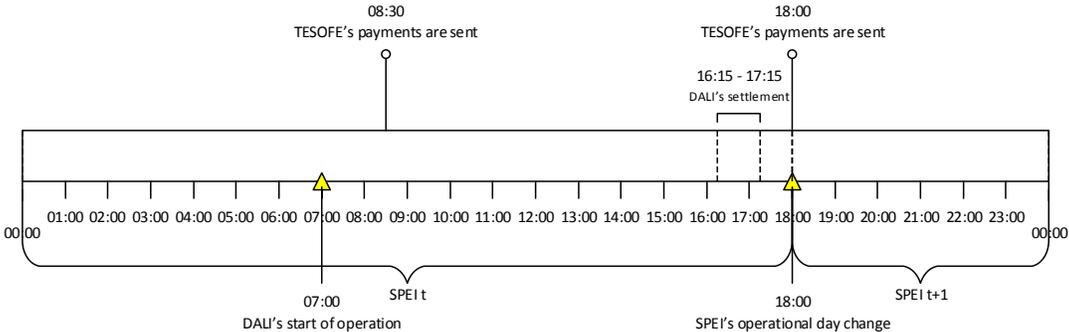
Figure 2. SPEI's payment processing flow



F. Operating Schedule

SPEI maintains a continued operation scheme, i.e., it allows the sending, receiving and return of payment orders year-round, 24 hours a day. Liquidity transfer operations with SIAC can be conducted from 19:00 hours to 18:00 hours of the following banking day. Between 18:00 and 19:00 hours, Banco de México carries out operations for the implementation of monetary policy.

The diagram below shows the most relevant times in the operating schedule.



IV. Principle-by-principle summary narrative disclosure

Principle 1: Legal basis

An FMI (financial market infrastructure) should have a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions.

Scope of the legal basis

The transactions that take place through payment systems in Mexico are under the Payments Systems Law, as well as under the financial legislation applicable in each case. In all instances, these rules are federal in nature. The legal basis of SPEI consists of:

1. Payments Systems Law¹⁶ and applicable financial legislation.
2. Circular 17/2010 (SPEI Regulation).¹⁷
3. SPEI's Operation Manual.
4. CEP Contingency Manual and the Contingency Manual for CLS Bank International (CLS) Operations.
5. Contracts between Banco de México, in its role as SPEI's administrator, and its participants.

The Payments Systems Law was approved by Congress, the nation's highest legislative body. In turn, the Circular and Manuals referred to in the preceding paragraph are issued by Banco de México and constitute the internal rules of the system, in which membership and functioning rules are established. Finally, contracts between Banco de México and the participants establish the rights and obligations regarding the provision of services related to this system.

The legal basis of SPEI underpins the system's activities and gives them a high degree of legal certainty. Its main features are described below.

Settlement finality

Under the SPEI Regulation, settlement of transfer orders takes place through a clearing process in accordance with the Payment Systems Law. Once SPEI settles a transfer order and sends the corresponding settlement notice to both the issuer and receiver, the order is considered accepted for all purposes. The aforementioned Law expressly states that accepted transfer orders, their clearing and settlement, as well as any other actions necessary to ensure compliance with the internal rules of a payment system (such as SPEI), are final, irrevocable, enforceable, and binding before third parties.

The above ensures the finality of accepted payments, regardless of whether a participant declares bankruptcy or the imposition of judicial or administrative decisions on participants (including a resolution that declares its insolvency and strives to limit the institution's payments).

¹⁶ The Payments Systems Law web [link](#).

¹⁷ SPEI Regulations web [link](#).

Issuing participants are allowed to send instructions to cancel transfer orders, but the system will only cancel those that have not been settled, as accepted transfer orders are final and irrevocable.

Netting arrangements

SPEI is a hybrid system that clears transactions through a process that takes place every 1.9 seconds, and the results are settled immediately in the participants' SPEI accounts. The process selects a set of payments that can be cleared and settled considering participants' available balances, orders placed in queue, and priorities assigned. Subsequently, SPEI registers the accepted payments, updates the participants' balances (i.e., settles the result of the clearing process) and sends messages to inform involved participants that the payments were settled. The process does not overdraw participants' accounts.

Clarity of the Legal Basis

The process of issuing and amending regulations and drafting of contracts includes frequent meetings with participants where they can present their views and experiences. It also includes a legal analysis to verify that regulations comply with applicable federal law.

Moreover, Banco de México monitors compliance with the rules and contracts through a process of continuous supervision of participants. Thus, interpretation problems with regards to participants' obligations are identified and, if necessary, clarifications or adjustments can be made.

Communication of the legal basis

SPEI's internal regulation is available to its participants at any moment. In particular, the SPEI Regulation is public and any modification is made available through the Official Gazette of the Federation and Banco de México's website¹⁸. Manuals contain reserved information only available for system participants and other entities with a legitimate interest. It is worth mentioning that Banco de México notifies its participants directly every time SPEI's internal regulation is modified.

Enforceability in all relevant jurisdictions

All Mexican financial regulation is federal in nature, so regardless of where participants or administrators are located, operations among them and their actions are subject to the same laws and the same authority.

Regarding SPEI, all jurisdictions in which its business activities are conducted are applicable. It is noteworthy that all operations are performed in Mexico, and as such, are subject only to Mexican legislation concerning financial matters and payment systems. This includes operations that involve CLS Bank.

In terms of jurisdictions applicable to SPEI because of its link with other systems, namely Banco de México's SIAC and the Securities Deposit, Administration and Settlement System (DALI), no conflicts

¹⁸ The Official Gazette of the Federation, a Constitutional Body of Mexico, publishes treaties, laws, decrees, sentences, agreements, resolutions, and other acts concerning the three Branches of the Federation, to be observed and applied in their respective scopes of duty.

arise between them since the internal rules and contracts are subject to the same regulation and authority.

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.

SPEI's objectives

Banco de México, Mexico's central bank, is the owner, administrator, and regulator of SPEI. The objectives of SPEI are described in the document "*Policy and Functions of Banco de México in Regards to Financial Market Infrastructures*". This document details that its objective is to settle the transfer orders of its participants and customers in a timely, efficient, and safe manner, at a low cost, taking into account the needs of both financial markets and retail payments. In particular, SPEI has the following guidelines:

- Settlement of transfer orders should occur in near-real time for the system, its participants and end users.
- The system should not generate credit nor liquidity risks.
- The system should offer a high level of service to its participants and their users with business continuity strategies and appropriate risk management.
- The system should facilitate for participants the provision of services, and provide participants' customers information about their payments.

The objectives are aligned to the provisions stated in the Banco de México's Law:

- Banco de México has the purpose of promoting the sound development of the financial system and fostering the proper functioning of payment systems (Article 2).
- The Bank shall regulate the payments systems (Article 3).
- Banco de México is entitled to issue regulation for the purpose of the sound development of the financial system and of the payment system, or the protection of the public interest (Article 24).
- Banco de México may regulate fund transfer services provided by credit institutions (Article 31).
- Banco de México may supervise the financial intermediaries and entities subject to the regulation that it issues to provide for the compliance of the regulation. This faculty includes inspection and supervision (Article 35 Bis).

The institutional planning scheme includes defining medium-term priorities for the institution (planning horizon of five years), which are endorsed by the Governor and reviewed by the Board of

Governors. Additionally, in the context of budget approval, Banco de México conducts an annual planning process aligned with the medium-term priorities, in which the heads of administrative units submit their work plans for the consideration of the Governor. Once the work plans have been approved by the Governor, they are presented to the Board of Governors. Work plans describe the goals, targets and projects of each administrative unit as well as the budgetary resources required to develop them, including those related to SPEI.

Among the institutional priorities, the most directly related to SPEI are the following¹⁹:

- To foster the use of electronic payment systems by promoting a regulatory framework that boosts efficiency and competition.
- To strengthen the internal control scheme, risk management, as well as physical and information-security of the Bank.

Additionally, explicit targets have been defined for the system's availability; these are reviewed periodically by the senior management and reported to the Governor and the Board of Governors. For 2016, the target was set for the system to be available at least 99.85% of its operating hours.

Governance arrangements mechanisms

SPEI is subject to the governance arrangements of Banco de México, supported by the Banco de México Law, the Banco de México Internal Regulations²⁰, and the Banco de México Administrative Units Ascription Agreement²¹.

SPEI's responsibilities are entrusted to the Governor, the Board of Governors and the administrative units that report to them. In this regard, Banco de México Law establishes the following:

- The performance of the functions and administration of Banco de México shall be entrusted to a Board of Governors and a Governor within their respective scopes of duty (Article 38).
- The powers of the Board of Governors (Article 46).
- The powers of the Governor (Article 47).

The Banco de México Administrative Units Ascription Agreement defines the lines of responsibility. For SPEI, the responsibilities fall under the Directorate General of Payment Systems and Corporate Services, through the Directorate of Payment Systems. Additionally, other administrative units of Banco de México are related to the system, such as the Directorate General of Information Technology, the Directorate General of Comptroller and Risk Management, the Directorate General of Legal Affairs, and the Directorate of Auditing.

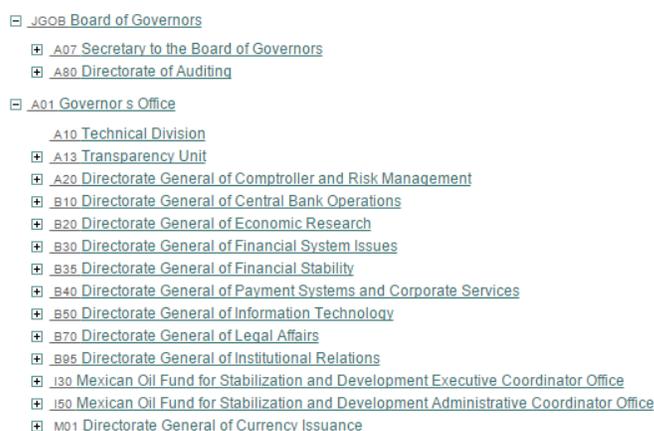
¹⁹ The medium-term priorities of the institution are available at the following [link](#) (available in Spanish).

²⁰ The Banco de México Internal Regulations can be found at the following [link](#).

²¹ The Banco de México Administrative Units Ascription Agreement can be found at the following [link](#) (available in Spanish).

A diagram of the organizational structure of Banco de México is presented below, for the top and second-tier positions²²:

Figure 3. Organizational structure of Banco de México



Banco de México's Internal Regulations dictate the functions of each administrative unit. As for the functions related to payment systems, including SPEI, the Directorate of Payment Systems has the following attributions²³:

- Monitor the behavior of the payment systems.
- Design, prepare and implement the policies for the development and proper functioning of the payment systems.
- Develop and maintain the payment systems that are administered by Banco de México, as well as other computer systems that are necessary for the correct operation of the former, and keep them technologically updated.
- Process and operate the systems mentioned in the preceding paragraph and provide advisory and support services to their participants.
- Execute and monitor the proper functioning of the payment systems administered by the Bank.
- Arrange, execute and monitor the transactions of the participants of the payment systems administered by the Bank.
- Establish policies to ensure the operational continuity of the payment systems.
- Participate in the issuance of provisions, authorizations, opinions, observations and vetoes in the matters of digital signatures, payment systems, exchange fees and commissions for the use of means of payment.
- Supervise compliance with the provisions, authorizations, observations and vetoes outlined in the previous section, as well as the fulfillment of delivery and accuracy of information

²² For the full organizational structure of Banco de México, see the [chart](#).

²³ To view the attributions of each administrative unit consult the [Banco de México Internal Regulations](#).

requirements that the Bank requests of institutions and financial intermediaries in matters within its scope.

- Provide the Directorate General of Financial System Issues and the Directorate of Regulation and Supervision, within the scope of its duties, with the necessary documents and information so that they may impose sanctions or corrective measures in terms of the Law, together with other competent Directorates.

In addition to the Internal Regulations, Banco de México has an Organization Manual and job descriptions, whose main purpose is to present in detail the objectives, functions, and job profiles of each of the administrative units.

The Directorate of Payment Systems' powers are distributed among different administrative units (Divisions). To avoid conflicts of interest, different divisions are responsible for defining the policies and conduct supervision of SPEI, for system development, and for operations. The following chart shows the structure of the Directorate of Payment Systems.

Figure 4. Organizational structure of the Directorate of Payment Systems



To fulfill the functions entrusted to Banco de México, the Board of Governors and the Governor, within their respective scope of duty, may establish advisory committees integrated with Bank's public servants that assist them in the exercise of their attributions. These committees may be of a consulting or decision-making nature.

Among the different committees that deal with issues closer to SPEI are the Business Continuity Committee (decision-making), the Security Committee (consulting), the Committee on Information Technology (consulting) and Audit Committee (referred to in the Internal Regulations).

Accountability

Banco de México has several accountability mechanisms for issues related to SPEI. Banco de México Law establishes various obligations, among which are the following:

- The Governor of Banco de México shall appear each year before committees of the Senate of the Republic to render a report of the fulfillment of his mandate (Article 47).
- Any of the two Chambers of the Congress of the Union may summon the Governor of Banco de México to account for the Bank's policies and activities (Article 52).

Banco de México generates an annual report about the financial system, which includes a section about the financial market infrastructures, including SPEI²⁴. Moreover, the document entitled Policy and Functions of Banco de México in Regard to Financial Market Infrastructures, which includes several aspects related to SPEI, is in process of formalization and publication.

In addition to the above, Banco de México is subject to address the inquiries of the general public, including those related to SPEI, according to the obligations that are established in the framework of the General Law for Transparency and Access to Public Information²⁵, the Federal Law of Transparency and Access to Public Government Information²⁶, and the legal orders derived from these.

From the point of view of Banco de México's internal accountability, there are schemes that apply to all hierarchical levels of the organizational structure. The accountability of senior management is part of the budget approval process, defined in the Standards and General Criteria of the Current Expense of the Budget and Physical Investment of Banco de México²⁷. The process through which the heads of administrative units present an annual report of compliance with their objectives is established in those provisions, considering operation, goals, and projects. Additionally, Banco de México has a performance management model that establishes the criteria, mechanisms, and periodicity of the personnel's compliance assessment.

Furthermore, Banco de México is held accountable through internal audit processes, whose results are reported directly to the Board of Governors, as well as external audits, executed by authorized entities.

Personnel integrity and suitability

To promote integrity in the performance of their duties, Banco de México's employees must comply with the following guidelines:

- a) *Institutional Ethics Code*²⁸. This code was approved by the Board of Governors of Banco de México; it establishes the ethical principles that the public officers of the institution shall safeguard, in addition to several obligations regarding their conduct in the performance of their duties.
- b) *Registry of public officers*²⁹. In accordance with the Federal Law of Administrative Liabilities of Public Officers, Banco de México keeps a registry of public officers where records of the

²⁴ The financial system reports can be accessed through the following [link](#).

²⁵ The General Law for Transparency and Access to Public Information can be accessed through the following [link](#).

²⁶ The Federal Law of Transparency and Access to Public Government Information can be accessed through the following [link](#).

²⁷ The Standards and General Criteria of the Current Expense of the Budget and Physical Investment of Banco de México can be accessed through the following [link](#).

²⁸ The Ethics Code of the Banco de México can be accessed through the following [link](#) (available in Spanish).

²⁹ The Registry of Public Officers of Banco de México can be accessed through the following [link](#).

curricular data of the public officers obliged to file property statements are kept, as well as the information concerning their assets record, and, where appropriate, administrative proceedings filed against them and penalties imposed on them, whether or not they have to file a property statement³⁰.

- c) *General Labor Conditions of Banco de México*. It establishes the employees' rights and obligations.
- d) *Liabilities Committee*. The Liabilities Committee is the organ of Banco de México in charge of the application of the Federal Law of Administrative Liabilities of Public Officers³¹ to the officials and employees of this Institution. This Committee determines the administrative liabilities of the public officers of the Bank and, where appropriate, imposes penalties. For the members of the Board of Governors and the three highest hierarchical levels of personnel, the Board itself determines the appropriate penalty based on the information provided by the Committee. In addition, the Liability Committee has faculties to issue the necessary regulations so that the Federal Law of Administrative Liabilities of Public Officers can be properly applied at this central institution.
- e) *Internal regulations*. Banco de México has internal management regulations and operation manuals that establish rights, obligations and procedures to be followed by the employees for the execution of their duties.

Banco de México has various mechanisms to ensure a desired combination of personnel competencies:

- a) *Recruiting process*: The recruitment and selection process at Banco de México is rigorous as the people who are hired must meet pre-set requirements according to their job profile. This process includes the assessment of technical and managerial abilities and medical and trust examinations.
- b) *Personnel promotion processes*: The administrative units of Banco de México are able to perform recruiting procedures based on selection contests where a panel, consisting of personnel from different departments issues recommendations about the most suitable person to fill a position.
- c) *Competencies assessment*. There is an institutional methodology to assess the degree of alignment of the personnel's competencies to their respective job profiles.

Disclosure of governance arrangements

Most of the elements that comprise the governance arrangements of SPEI are public and can be accessed through Banco de México's website. Those include the Banco de México Law, the Internal Regulations of Banco de México, the Banco de México Administrative Units Ascription Agreement, the Standards and General Criteria of the Current Expense of the Budget and Physical Investment of

³⁰ The publicizing of the information related to the assets status, will be provided with the prior and specific authorization of the concerned public officer.

³¹ The Federal Law of Administrative Liabilities of Public Officers can be accessed through the following [link](#).

Banco de México, Banco de México's organizational charts, the Public Officer Registry of Banco de México, the Ethics Code of Banco de México and Banco de México's objectives and goals.

It should be noted that all the internal regulations applicable to each employee are available through Banco de México's internal website. In addition, any updates to the regulation are notified through e-mail.

Consideration of the interests of the participants

Banco de México's officials participate in a working group that meets frequently and includes SPEI participants to discuss issues of interest that may affect them. At these meetings, specific issues about the system are addressed and participants can express their views and concerns. In addition, the Governor and the Board of Governors hold meetings with financial institutions, where banks can address issues related to SPEI. It is important to note that Banco de México is currently working on the formalization of the working group's operational rules, which will include non-bank financial institutions.

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.

Comprehensive risk management framework

Banco de México has a risk management framework to identify and manage the risks to which SPEI is exposed. The applicability of risks is described in detail in the corresponding notes for each principle in this document. It is worth noting that, by design, SPEI is not exposed to credit, liquidity, custody nor investment risks.

The senior management has established policies, procedures, and controls consistent with SPEI's risk management framework. This framework enables Banco de México to identify and routinely assess the risks that are borne from SPEI, from its interdependencies with other systems and the risks that participants pose to the system. Banco de México reinforces the assessment by internal and external program audits to support the risk's identification.

Risk tolerance policy

As part of the framework for the comprehensive management of risks, Banco de México is in the process of formalizing its current risk tolerance policy, which designates those responsible of defining said risk tolerance policies, including thresholds and additional risk-controls in case of exceeding them.

Incentives

Banco de México sets incentives to SPEI participants for them to comply with SPEI's operational rules and contractual provisions of the service. These incentives are in the form of contractual penalties, and are based on the results of supervision activities conducted by Banco de México.

In addition, Banco de México periodically analyzes SPEI's most relevant participants' business continuity plans to ensure that they are able to operate in a contingency. In the event of an incident that affects a participant's ability to operate, the incident is monitored and managed through a process whereby information is requested of the participant to identify the source of the problem, define a plan of action and those responsible for its implementation, as well as determine the times allotted to deal with the incident's causes. This process mitigates the risk of a similar incident occurring in the future.

Identification of risk scenarios

Banco de México periodically evaluates the risks that could materially affect its ability to perform or provide services as expected, in particular, material risks reported in the monitoring process, and the observations arising from internal and external audit programs. Among these risks, Banco de México has identified risks from other FMIs and service providers. Consequently, Banco de México has implemented preventive and corrective controls to minimize the effects of a materialized risk in the availability of SPEI and aims to ensure that the system has sufficient capacity in these scenarios. These issues are described in more detail in this document's for Principle 17.

Principle 4: Credit risk

An FMI should effectively measure, monitor, and manage its credit exposures 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 participants and their affiliates that would potentially cause the largest aggregate credit exposure to 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 to the CCP in extreme but plausible market conditions.

This principle is not applicable to SPEI.

SPEI is not exposed to credit risk as it does not extend credit to participants, nor does it establish procedures for participants to extend credit among themselves. SPEI settles transactions with balances that participants hold in the system, and SPEI does not overdraw their accounts.

The funds used by the participants to make payments through SPEI come from incoming transfer orders or, in the case of credit institutions, by means of transfers from participants' SIAC account. Payments are settled only when the clearing process determines that participants have sufficient funds. Payments that cannot be settled in this way are queued until the next settlement process. At

the close of the operating day, SPEI transfers all participants' account balances to their accounts in SIAC, if they have one, or to a SIAC concentration account that does not accrue interest. At the end of the system's operating hours, SPEI cancels all payments that have not been settled.

Banco de México provides liquidity to banks to settle transactions in the payment system via two mechanisms. A bank may:

- Instruct Banco de México to reserve a fraction of the amount of deposits held in Banco de México to guarantee overdrafts on its SIAC current account. Once this is done, Banco de México allows overdrafts up to the amount reserved. The main use of these overdrafts is to transfer money to the same bank's account in SPEI.
- Request a repo operation with Banco de México, in a system that processes them automatically at DALI. Banco de México accepts securities issued by the federal government, the Institute for the Protection of Bank Savings (IPAB), or Banco de México itself and determines and publishes the haircuts applied to these securities.

Current account overdrafts are entirely covered by deposits reserved for this purpose. In addition, the value of these deposits does not depend on market conditions, so that this mechanism does not generate credit risk³².

The repos may cause losses to Banco de México if i) rates rise more than forecasted by Banco de México during the term of any repo and the underlying value is lower than the amount of the repo, and ii) the bank defaults before returning the money. Banco de México estimates that it is unlikely for such losses to occur, and even less likely that they generate substantial losses. Banco de México establishes limits for these repos based on the net capital of the involved institution.

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.

This Principle does not apply to SPEI.

As SPEI is not exposed to credit risk, it does not require collateral from its participants. Nevertheless, Banco de México, in its capacity as central bank, and as mentioned in this document's explanatory note for Principle 4, has two main mechanisms to provide liquidity to its account holders and, hence, to the payment systems:

- Obtain credit up to the value of assets that are deposited with Banco de México.

³² In certain scenarios, this could have an effect in the instrumentation of monetary policy, which would require to take actions that would imply marginal costs to Banco de México.

- Deposit liquid securities issued by the Federal Government, the Institute for the Protection of Bank Savings, or Banco de México itself under a repurchase agreement.

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 does not apply to payments systems.

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.

This Principle is not applicable to SPEI.

SPEI is not exposed to liquidity risks since it only settles payments that do not rely on overdrafts of their accounts. Participants cannot fail to comply with their obligations because the central bank does not extend credit.

Similar to what happens in Real-Time Gross Settlement systems (RTGS), SPEI requires its participants to keep sufficient funds that allow the appropriate flow of payments in the system. In this regard, participants are responsible for holding sufficient resources to settle their payments. However, some may lack sufficient funds to meet their obligations with other entities, including those instructed by the participant's customers, which could generate knock-on effect risks, that is: the inability to fulfill a financial obligation on time could cause other participants and their customers to delay their own obligations, since they did not receive the expected incoming payments required to send their own payments. This risk does not arise from SPEI's structure; it is a result of the financial obligations arranged between participants. However, the risks involved are considered significant and thus, as pointed out in the Principle 4 summary narrative, Banco de México mitigates this risk through two mechanisms to provide banks with enough resources to enable them to settle their obligations promptly:

- Obtain credit up to the value of assets that are deposited with Banco de México.
- Deposit liquid securities issued by the Federal Government, the Institute for the Protection of Bank Savings and Banco de México itself under a repurchase agreement.

SPEI runs through a clearing process frequently in order to optimize the available liquidity; i.e., the process reduces the resources required to settle its transactions, as compared to a gross settlement system. To achieve this, SPEI runs an algorithm that determines which payments can be settled with the participants' balances held at the moment. To better manage their liquidity, participants can reserve part of their balances. The liquidity saving algorithm first tries to settle high-priority transfer orders, which can use the reserved account balance. Once SPEI registers the accepted transfer orders, it updates the participants' account balances (i.e., settles the net account balance, after the clearing process) and sends real-time messages to the respective participants to inform them which transfer orders were settled.

The moment SPEI sends settlement notices to the issuing and receiving participants, transfers orders become accepted, which, in accordance with the Payments Systems Law, shall be final, irrevocable, enforceable and binding before third parties.

If a payment cannot be settled due to a participant's lack of liquidity, the payment is queued until the next clearing cycle and is settled only when the participant has enough resources in its account.

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.

Final settlement

In accordance with the SPEI Regulation and its Operational Manual, once SPEI settles a payment and sends a settlement notice to both the issuing and receiving participants, the transaction acquires the status of accepted transfer order which, by the Payments System Law, is final, irrevocable, enforceable and binding before third parties.

The above guarantees the finality of accepted transfer orders regardless of insolvency procedures or judicial sanctions concerning civil or commercial matters in which the participant may have engaged, including any insolvency resolution or bankruptcy declaration concerning any participant, whose purpose is to prohibit, suspend, or in any manner restrict the payments that this participant shall carry out.

Same-day settlement

SPEI settles its transfer orders as soon as possible, on the same day that the order is received. SPEI's Regulation establishes that transfer orders not settled due to insufficient balance shall be queued until the next settlement cycle. At the end of SPEI's operating hours, the system cancels those orders that were not settled, so obligations do not accumulate from one day to the next.

Cancellation of transfer instructions

The SPEI Regulation and its Operations Manual state that issuing participants are allowed to send instructions to cancel transfer orders. Nevertheless, the system only cancels orders which have not been settled, as settlement is final and irrevocable.

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 minimise and strictly control the credit and liquidity risk arising from the use of commercial bank money.

SPEI uses central bank money to settle monetary transactions arising from the system's operation. SPEI does not settle transactions using commercial banks' money.

Credit and liquidity risk in money settlements

SPEI only conducts its settlements in national currency. All settlements of transactions are made in central bank money that participants have deposited in the system's accounts, which in turn allows participants to meet their obligations. The system does not grant credit nor allows participants to overdraw accounts. This provision avoids generating credit risk among participants and the system.

Settlement on the books of an FMI

SPEI manages accounts with participants' resources to settle funds transfer orders. Account balances are liquid liabilities for the central bank.

Finality of funds transfers between settlement accounts

SPEI does not use settlement banks' services, settlement is conducted within the system with central bank money. As mentioned in the explanatory note regarding Principle 8, settlement finality is based on the Payments Systems Law and the SPEI Regulation according to which payments are final once the participants (receiving participant and issuing participant) have received a settlement notice from SPEI.

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 does not apply to payment systems.

Principle 11: Central securities depositories

A CSD should have appropriate rules and procedures to help ensure the integrity of securities issues and minimise and manage the risks associated with the safekeeping and transfer of securities. A CSD should maintain securities in an immobilised or dematerialised form for their transfer by book entry.

This Principle does not apply to payment systems.

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 does not apply to SPEI, since SPEI does not allow linking final settlements obligations.

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.

This Principle does not apply to SPEI.

Due to its design and operational rules, SPEI does not allow financial defaults nor faces credit or liquidity risks. Note that these rules ensure the finality of accepted transfer orders regardless of the insolvency procedures or judicial sanctions concerning civil or commercial matters in which the participant may have engaged, including any insolvency resolution or bankruptcy declaration concerning any participant, whose purpose is to prohibit, suspend, or in any manner restrict, the payments that this participant shall carry out.

Therefore, there are no specifically considered rules or procedures to manage a participant's default.

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 does not apply to payment systems.

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.

SPEI is owned, operated, and managed by the central bank. Since the central bank is authorized to issue banknotes, the risk of not having sufficient liquid assets to operate is not relevant.

Moreover, Banco de México has a fee scheme based on cost recovery. Consequently, the cost of operation, maintenance and development, investments in new projects for the system and the renovation of equipment and programs for the following year are all passed on to participants. The fee for each participant is charged on a monthly basis and depends on the relative participation rate of the participant in the system.

SPEI's exposure to general business risk is limited to an underestimate of its operational costs, which may derive from an omission of factors and result in additional costs for the system or an unexpected increase in its current costs. To mitigate this risk, Banco de México annually reviews the costs to determine the corresponding fees per participant. Additionally, in case Banco de México cannot meet its payment obligations to the suppliers from its fee revenues, the central bank maintains a contingency fund to cover up to 18 months of operation cost.

Principle 16: Custody and investment risks

An FMI should safeguard its own and its participants' assets and minimise 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.

Banco de México's assets, in its role of administrator and owner of SPEI, and SPEI's participants' assets are safeguarded in accounts managed by the central bank itself. The account management is conducted with solid accounting practices that are well documented, along with internal controls subject to auditing.

Participants have immediate access to the resources they hold in the system, and they can transfer funds within SPEI itself or send funds to other FMI throughout SPEI's hours of operation.

From an isolated perspective, SPEI is not exposed to custody and investment risk since it conducts its money settlements in central bank money. Considering the broad context, Banco de México obtains assets through repo operations, and holds these in custody in accounts managed by the Central Securities Depository (known by its Spanish acronym INDEVAL). These are high quality assets

with haircuts established by Banco de México; therefore, these assets are subject to negligible market risks, notwithstanding their exposure to operational risks.

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 fulfilment of the FMI's obligations, including in the event of a wide-scale or major disruption.

Operational risk management framework

From an institutional perspective, operational risk assessment is an element of the Internal Control System³³ and refers to the analysis of the risk factors that may cause losses to the Bank's assets or processes, thus affecting the achievement of its objectives. Operational risk identification and assessment is based on the institutional catalog of processes that uses a homogeneous and standardized methodology to establish the relative relevance of each of the risks to which the processes are exposed.

The operational risk management framework for SPEI comprises a continuous process of analysis, evaluation, and mitigation of risks. The risk analysis starts with the identification and evaluation of the risks in the processes; the evaluation considers the frequency of the risk materialization and its impact.

Once a risk has been assessed, it is determined whether it is acceptable considering the risk tolerance policy established by Banco de México. The risk tolerance policy, among other considerations, takes into account SPEI's availability goals, in addition to business continuity measures and controls that are implemented in the operation of payment systems. The risk tolerance policy is currently in process of being formalized.

Risk management includes the design and implementation of controls to mitigate the frequency and/or the impact of a risk's occurrence and the periodical evaluation of the controls' effectiveness.

Operational risk management responsibility

Each administrative unit is responsible for the identification and administration of the operational risks inherent to their processes, according to the institution-wide criteria and methodologies established by the Directorate General of Comptroller and Risk Management. For the Directorate of Payment Systems, the Payment Systems Operational Continuity Subdivision is the department that

³³ The Internal Control System is the organization and group of activities, regulations, policies, standards and procedures established by the institution, to obtain reasonable assurance that the objectives of Banco de México will be achieved.

specializes in risk assessments and operational continuity measures. The following chart shows the hierarchy of these departments:

Figure 5. Organizational structure of the Directorate of Payment Systems



The partitioning of responsibilities between the operational and technological divisions allows for the management of fraud risks. The operational division operates SPEI's testing and production environments and the information related to the operations. The technological division cannot operate these environments and does not have access to historical information. In the event of an incident that requires the collaboration of both units, there are protocols in place that ensure the activities are documented.

Business continuity plans

SPEI's business continuity plans are supported by Banco de México's Payment System's Business Continuity Management System (BCMS), which considers best practices and international standards, in particular ISO 22301 – an international standard for business continuity management systems. The main objectives of the BCMS are to:

- Identify and assess risks and impacts to which critical resources of the provided services are exposed.
- Establish procedures to respond to a disruptive incident that impacts the normal functioning of the system.
- Recover critical functions of the service through the execution of operational continuity strategies.
- Integrate the strategies mentioned above to the organizational culture through communication and exercising.

The BCMS was used for the definition of SPEI's Business Continuity Plan (BCP), which considers the identified risk factors. The BCP outlines actions to restore SPEI's service if the following risks materialize:

- Unavailability of primary facilities as a result of natural, social, or infrastructure related causes.
- Inability to operate SPEI on the primary servers due to hardware, software, or communication malfunction.
- Impossibility to access SPEI's operational facilities due to external factors such as health alerts.

- Vulnerability of the computing infrastructure caused by a virus or malware, which affects the functioning of the system.
- Prolonged interruption of the system application that cannot be recovered within the established recovery time objective.

If any of the risk scenarios mentioned should materialize, SPEI is protected through a redundant infrastructure that prevents the existence of unique points of failure, monitoring tools that analyze the system's behavior, various operational schemes if primary facilities are unavailable, as well as authentication and encryption schemes to control access and ensure data privacy.

In addition, Banco de México has implemented an alternate operation procedure for SPEI through which critical operations can be processed even in an extreme contingency scenario. This procedure considers interruptions suffered by SPEI that force operation to continue in an alternate way.

Audit

Banco de México is subject to auditing through the Directorate of Auditing, which reports to the Board of Governors. These internal audits allow identifying noncompliance with any rules or manuals, as well as risks related to SPEI that require the implementation of controls. Banco de México is also subject to external auditing performed by authorities with the faculty to do so. Whenever the Bank considers it necessary, it may hire specialized services to review SPEI's security and the implemented operational controls.

Operational reliability objectives

Banco de México has established various objectives regarding SPEI's operational reliability; these objectives are reviewed periodically. For 2016, the following goals have been defined:

- 99.85 percent of system availability.
- Recovery time of under two hours.

Operational capacity

Banco de México regularly monitors the system's volume of operations to identify tendencies. The metric currently used to measure the operational capacity is the number of payments that can be processed in a minute. To determine this number, the Central Bank tests the system with SPEI's participants.

The system's capacity analysis indicates that SPEI is comfortably able to process the payments sent by its participants. On the other hand, participants cannot send more payments than SPEI can process due to its programming protocol. This feature can delay, for instance, the processing of a large payroll; however, participants can prioritize the payments they want to settle in real time, which are usually generated by independent processes.

Lack of liquidity for any bank or processing a larger number of payments would require more memory and storage capacity in the system. However, these events do not represent relevant risks

as the resources are continually monitored and the technological infrastructure that the system uses can be augmented as needed.

It is possible for participants to generate enough payments to cause delays that jeopardize real time settlement. In this vein, SPEI is not versatile as it uses one processor for several important processes. Some of these, such as the validation of digital signatures, message storage or settlement notices are independent of each other which is why Banco de México is assessing the changes required for SPEI to use several processors and process large sets of payments in a manner that will not interfere with the real time settlement.

Information security policies

Banco de México has established institutional information security policies aligned with international standards, such as ISO/IEC 27001, a standard to manage information security.

In regards to these policies, the Information Technology Internal Administrative Rules define security guidelines for users, system operation and support, management of infrastructure services, and system and infrastructure development. Among other elements, these rules establish general policies on information security, access control, connection restrictions, backups, reports on security incidents, and monitoring and assessment of the infrastructure.

One of the security measures in place for SPEI is that sensitive and relevant files related to the system are encrypted to protect their content. Additionally, there is a systems access control policy in place.

By using digital signatures for all transactions, SPEI's programming protocol ensures the authenticity of the information and that the issuer cannot repudiate payments once they have been sent. Furthermore, participants are connected to SPEI through a private network that uses encrypted communications.

SPEI uses digital signatures to protect the transactions that the system processes. These mechanisms are based on international security standards for authentication, signature and encryption of information, such as:

- X.509v3 (RFC 3280) standard for certificate's formats.
- PKCS #1 (RFC 2313) standard for RSA type private keys.
- PKCS #1 standard for the creation of digital signatures and its validations.

Physical security policies

Banco de México has adopted physical security policies under the responsibility of the Directorate of Security, part of the Directorate General of Currency Issuance. These policies determine the procedures for access to high security facilities, entry and exit of goods, suppliers and contractors and the coordination of physical safety measures.

Service continuity management

Testing for SPEI's readiness to operate normally in the occurrence of a disruption, such as unavailability of primary facilities or computing infrastructure failure, is held according to an agreed schedule between operations and support personnel.

There are established guidelines that describe the actions that must take place whenever a change is needed in SPEI's production environment. These changes require tests from the quality control and operational departments as well as the participants. These tests are conducted in the testing environment, which is separate from the production infrastructure.

In addition, Banco de México's Business Continuity Committee has protocols in place for crisis management. Among other elements, these protocols establish the communication flow between administrative units. For the Directorate of Payment Systems, an action and communication plan has been defined to manage crises that affect the provision of SPEI's service. This plan involves a communication tree which is tested regularly to ensure its validity.

Monitoring and risk-management of participants

To become a participant of the system, an entity must comply with a certification procedure that includes tests to ensure the proper functioning of its infrastructure. Participants are required to notify Banco de México of changes to the systems they use to operate SPEI to perform validations.

In addition to the above, SPEI's relevant participants' business continuity plans are reviewed to ensure their contingency policies are up to date and functioning. Whenever an incident occurs that affects the operation of a participant, the administrative unit responsible for the business continuity management will ask the participant to submit a report with information on the cause of the problem, the action plan and those responsible for implementing it, as well as the timeline in which to do so in order to avoid future incidents.

Banco de México requires potential SPEI participants to comply with operational risks management and information security requirements in order to enhance the system's risk management framework. These requirements are monitored through a supervision program that verifies in-site that participants of the system and potential participants are complying.

Interdependencies with other systems

One of the most relevant dependencies of SPEI is the connection with SIAC required to transfer the corresponding funds at the start of the day's operations. To manage the risks inherent to this connection, Banco de México has an alternate procedure to manually transfer the money between the systems.

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.

Access requirements

Currently, the main criteria to participate in SPEI are public and stated in the SPEI Regulation. According to these criteria, the following entities may participate in SPEI: regulated financial institutions, clearing houses authorized by Banco de México in terms of the Law for Transparency and Regulation of Financial Services, and other entities regulated and overseen by Banco de México, the National Banking and Securities Commission (known by its Spanish acronym, CNBV), the National Savings System for Retirement (known by its Spanish acronym, CONSAR), or the National Insurance and Bonding Commission (known by its Spanish acronym, CNSF), as well as any other entity authorized by Banco de México

The entities interested in acting as participants must communicate their intention to Banco de México and comply with the certification tests for the software that they will use to connect to SPEI. Additionally, they must enter into a contract with Banco de México.

The operational tests that the participants must comply with and the legal conditions established in the contracts are essentially the same for any participant; hence, all potential participants face equal terms to access the system.

Moreover, SPEI participants are required to pay the fees determined by Banco de México to cover SPEI's connection costs to the private network operated and maintained by Banco de México, as well as an annual fixed fee and a monthly variable fee. Banco de México establishes the annual fixed fee based on the SPEI's overall operation and maintenance cost, plus provisions for investments in new projects for the system and the renovation of equipment and programs for the following year. The monthly variable fee is determined by the number of transfer orders sent to CLS Bank, funds transfer requests, refunds and the amount of retransmitted information. It is noteworthy that SPEI's operational costs are low, so they cannot be considered a barrier to entry.

The technical requirements and the costs that participants must cover are only disclosed to the institutions that have shown an interest in participating and comply with the legal requirements. This is due to the fact that technical information is considered classified and costs vary each year and depend on the operational level of each institution, which is not publicly disclosed information.

Risk based participation requirements

Currently, only regulated financial institutions can participate in SPEI so that participants are subject to the regulation and supervision of a financial authority.

As previously mentioned, Banco de México requires the interested entities to meet the necessary technical requirements to operate in SPEI, which the Bank verifies through the certification process.

Additionally, as stated in Principle 17, Banco de México requires institutions that intend to participate in SPEI to satisfy the operational risk management and information security requirements established by Banco de México.

Monitoring participation requirements

Banco de México has a review procedure to determine whether participating institutions meet the legal requirements for participation established in the SPEI Regulation. The Board of Governors is informed of participants' entry to and exit from the system. In addition, participants are required to notify Banco de México of any changes to the infrastructure they use to operate through SPEI, so that Banco de México can determine whether a new certification must be performed to ensure that communication protocol requirements are satisfied.

Regarding requirements relating to operational risk management and information security, compliance is monitored through an in-site supervision program, both for participants and potential participants.

Suspension and orderly exit of participants

According to the SPEI Regulation, Banco de México may, at any time, suspend or terminate the operations of SPEI with one or more participants when, in the opinion of Banco de México, the participants may generate risks in the operation of payment systems; or else, when they carry out operations contravening internal regulations of SPEI or clauses of the contract executed to participate in SPEI.

Principle 19: Tiered participation arrangements

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

The Principle does not apply to SPEI.

SPEI only has direct participants. To operate in the system, each SPEI participant is subject to the rules and agreements established by Banco de México.

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 does not apply to payment systems.

Principle 21: Efficiency and effectiveness

An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.

Participants' and market's needs

SPEI aims to effectively and efficiently satisfy the needs of the participants and the markets it serves. The system facilitates the automation of participants' processes (Straight Through Processing). To do this, it operates through an open protocol, which does not depend on a certain architecture, programming language or operating system. Based on this communication protocol, institutions that participate in the system can develop an application to connect to SPEI according to their particular needs.

The system functions practically in real-time and has a hybrid scheme with an algorithm that helps make efficient use of participants' liquidity. Moreover, fees charged to SPEI are low enough for participants to use it even to settle low-value payments and its performance is such that it allows for the processing of a significantly higher number of transactions than those currently being processed.

Banco de México has modified SPEI to meet the needs of its participants and of the markets in which it operates. For example, it has added new payment types, expanded the information that participants can send in the transfers that the system processes, implemented additional services such as notifying issuers and final beneficiaries of the status of their payments, increased its operating hours to achieve interoperability in the market of mobile operations and increase the system's robustness, capacity and processing speed.

To ensure that the system meets the needs of its participants, Banco de México maintains communication via working groups, which identify needs, determine actions and monitor work plans. Moreover, participants are notified and consulted before changing the operating rules of the system.

Additionally, Banco de México maintains a channel for participants to have access to advice and support related to payment systems. Moreover, participants have been asked in satisfaction surveys to share their views on the system's operation and evaluate the service they receive from SPEI's administrators.

Objective and target definition

As pointed out in the explanatory note of Principle 2: "Governance", service availability is an important component of the objectives, targets and work plans related to SPEI. Additionally, there are service level agreements, which establish policies about the maximum time for addressing incidents, depending on their priority.

Additionally, business priorities related to SPEI are established in the context of the institutional planning framework, which is used to build multi-year work plans according to the specific objectives that have been established concerning the system.

Regarding the administration of costs related to SPEI, a yearly estimation of the expenses generated by SPEI is used to calculate the fees to be paid by participants, under a policy of cost recovery.

Objective and target monitoring

The senior management team reviews SPEI's work plans quarterly using progress reports, so that deviations are corrected according to schedule. In addition, such advances are reported to the Governor annually, or more frequently if required. Similarly, regular monitoring is given to SPEI indicators in order to assess whether it is meeting the established goals.

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.

Communication protocols and procedures

Communication between SPEI and its participants is based on a proprietary protocol designed and developed by Banco de México. This protocol was established with the purpose of making the exchange of information efficient and includes security checks that validate the authenticity of the participant that generates instructions. While SPEI's protocol is not an international standard, participants have not expressed a desire to adopt one.

Considerations regarding cross-border operations

SPEI does not process cross-border operations. While the CLS Bank is a participant in the system, the transactions it sends and receives are restricted to the settlement of the results of the clearing of net positions in Mexican pesos. To communicate with the CLS Bank, Banco de México has a tool that translates messages from the format used in SPEI to the one used in SWIFT and vice versa.

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.

Rules and procedures transparency

SPEI participants can consult the internal regulations of the system at any moment. In particular, the SPEI Regulation is public and any modification is made available through the Official Gazette of the Federation and Banco de México's website. Manuals contain classified information only available for system participants and other entities with a legitimate interest. It is worth mentioning that Banco de México notifies its participants every time SPEI's internal regulations are modified.

Clearness in rules, procedures and risks of participants

SPEI's Operational Manual has a description of design and operational aspects with which participants must become acquainted to operate in the system. Additionally, there is complementary technical documentation which is available to all participants.

Rights and obligations of participants are derived from the SPEI Regulation, the Operational Manual and the contract signed with Banco de México (in its legal and administrative role as system operator). In this sense, participants have access to information which is required to determine the risks assumed when they enter to the system. Among other aspects, the SPEI contract establishes penalties to which participants are subject in case of failing to comply with the clauses established therein.

Wanting to assure that all participants comprehend modifications of the provisions which regulate SPEI's operation, Banco de México makes these available and takes participants' opinions into consideration prior to their entry into force. Also, Banco de México has a single-window through which any SPEI participant can request clarifications or submit comments. Additionally, if a participant requires it, Banco de México can meet with the interested participant to clarify any doubt they may have.

Disclosure of fees and other costs to participants

SPEI's fee framework is included in the SPEI Regulation. The framework determines a procedure through which Banco de México makes applicable fees known to participants. Additionally, the SPEI Regulation establishes general aspects regarding fee determination for each participant. In particular, Banco de México determines a fixed annual fee based on the overall cost of operation and maintenance of SPEI, considering provisions for new investments in SPEI projects as well as equipment and program renewals. This fee is determined and applicable for the following year.

Also, a monthly variable fee is determined by the quantity of transfer orders sent to CLS Bank, transfer requests, refund orders and quantity of retransmitted information.

Each institution interested in participating and in compliance with the legal requirements is notified in detail of the costs they must cover.

Transactional information

Banco de México discloses SPEI statistics³⁴(including number of transactions and amount operated by the system) every month and daily publishes statistics on its participants' connections³⁵.

Divulgence of PFMI compliance

With this briefing's publication, the CPSS and IOSCO framework of disclosure is satisfied. This publication will be updated every two years or when relevant changes to SPEI's development and operation warrant it.

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 does not apply to payment systems.

³⁴ Statistics on the number of transactions and amount operated by the system can be found at the following [link](#) (available in Spanish).

³⁵ Participant's connection statistics can be found at the following [link](#) (available in Spanish).

V. List of publicly available resources

Publicly available resources related to SPEI are listed below.

Laws

- [Banco de México Law](#).
- [Payments Systems Law](#).
- [General Law for Transparency and Access to Public Information](#) (available in Spanish).
- [Federal Law of Transparency and Access to Public Government Information](#).
- [Federal Law of Administrative Liabilities of Public Officers](#) (available in Spanish).

Internal regulations and general information related to SPEI

- [Circular 17/2010 - SPEI Regulation](#).
- [General information about SPEI](#).
- [Statistics on the number of transactions and amount operated through SPEI](#) (available in Spanish).

Banco de México's governance arrangement

- [Mission and Vision of Banco de México](#).
- [Objectives and goals of Banco de México](#) (available in Spanish).
- [Banco de México Internal Regulations](#).
- [Banco de México Administrative Units Ascription Agreement](#) (available in Spanish).
- [Banco de México Organizational Structure](#).
- [Standards and General Criteria of the Current Expense of the Budget and Physical Investment of Banco de México](#) (available in Spanish).
- [Civil servants' registry](#).
- [Ethics Code of Banco de México](#) (available in Spanish).