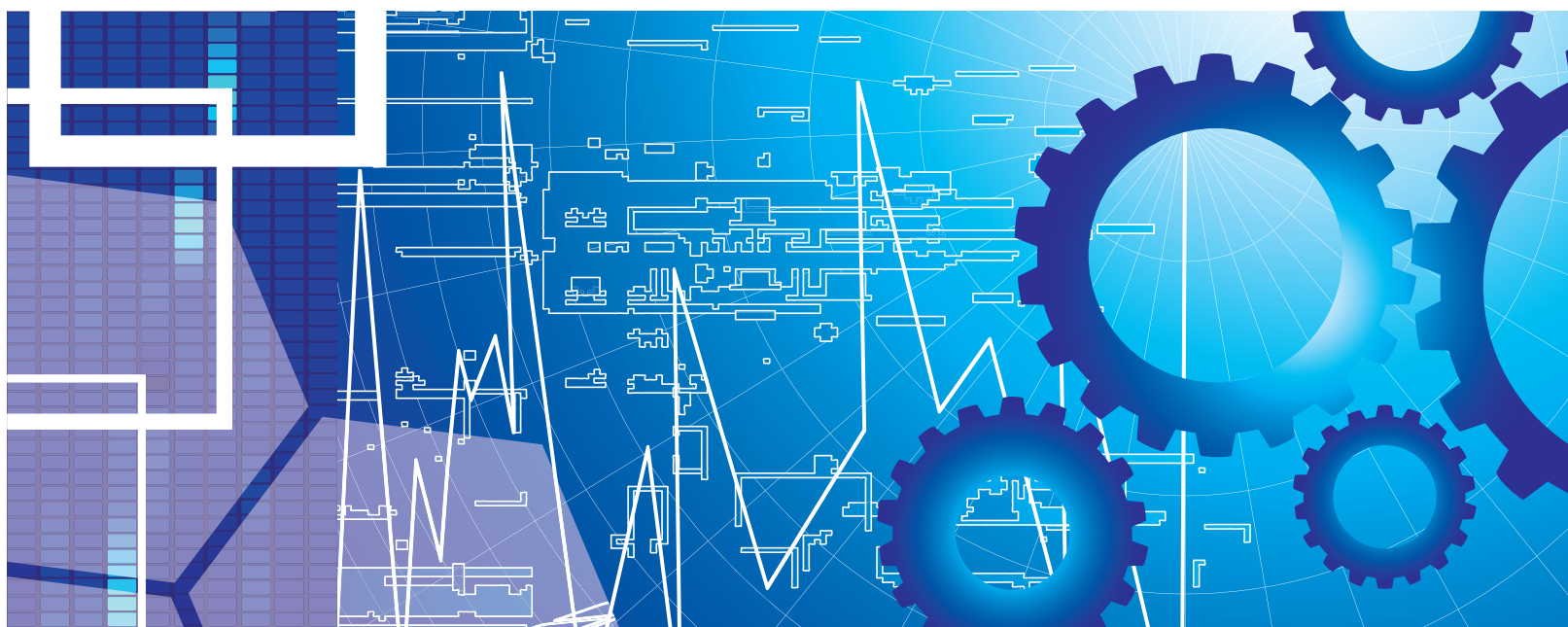


Management of the High-Value Payment System of the Central Bank of Chile

2017



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Management of the High-Value Payment Systems of the Central Bank of Chile

Executive Summary

Payment systems play a key role in monetary policy effectiveness, financial stability, and the performance of the economy in general. The Central Bank of Chile (hereinafter “the Bank” or “the Central Bank”), under its legal mandate, regulates and supervises the safe and efficient operation of these systems, while acting as both system operator and user in the provision of these services and promoting improvements and advancement in the financial infrastructure.

The oversight of the payment systems contributes to the resilience of the financial system. The considerable value of the transactions processed through these systems and the heightened international concern for financial stability underscore the importance of monitoring the risks to which payment system participants are exposed, in particular systemic risk.

In 2012, the Committee on Payment and Settlement Systems (CPSS) of the Bank for International Settlements (BIS), in conjunction with the International Organization of Securities Commissions (IOSCO), published the *Principles for Financial Market Infrastructures* (PFMIs), which drew on the lessons of the 2008 financial crisis to harmonize and strengthen existing standards. These higher standards created a need for changes in the legal and regulatory framework and in financial infrastructure practices in almost all jurisdictions, including Chile. In this context, the local financial authorities decided to coordinate their actions to achieve compliance with the new principles. Thus, in 2015 the Finance Ministry and the Bank asked the World Bank and the International Monetary Fund to evaluate the degree of compliance with the new standards in Chile and to make recommendations for closing any existing gaps. The assessment was applied to all financial market infrastructures, and the results were recently published. The general results were satisfactory, and some of the recommendations have already been implemented.

One of the proposals for regulatory development contained in the assessment report was the definition of a regulatory and supervisory framework for systemically important payment systems, together with the formal adoption of the PFMIs. Consequently, the Central Bank of Chile recently implemented an explicit policy framework for overseeing all systemically important payment systems, taking into account that the RTGS system is regulated and supervised by the Bank, while the high-value clearing house (LVCH)—a high-value deferred net settlement (DNS) system operated by ComBanc, a banking services support corporation—is regulated by the Bank and supervised by the Superintendence of Banks and Financial Institutions (SBIF). Specifically, Chapter III.H of the *Compendium of Financial Regulations*, on payment systems, entered into force in January 2018, expressly requiring compliance with the PFMIs in the RTGS and LVCH payment systems.

Subsequently, in accordance with paragraph 8 of Section 35 of the Central Bank's Basic Constitutional Act, incorporated via Law 20,956 in late 2017, the regulatory framework for payment infrastructures was strengthened, together with their interconnection with other jurisdictions. The Bank is now authorized to recognize payment systems established overseas, so as to allow their use by banks and other financial institutions supervised by the SBIF. In addition, a clear legal definition was established for the final and irrevocable settlement of transactions and the legal protection of collateral pledged in the payment systems recognized by the Central Bank of Chile. These concepts were previously addressed only at the regulatory level.

The real-time gross settlement (RTGS) system, which is owned and operated by the Central Bank, processes interbank, client-account, and securities market (delivery versus payment) transactions, which are sent by participants via the SWIFT network. Transactions are settled immediately in the accounts of each bank, with electronic transfers executed as soon as the orders are received by the system and the availability of funds is verified in the account of the payment originator (gross settlement). Similarly, the Central Bank's transactions involving open market operations, the standing deposit and liquidity facilities, cash withdrawals and deposits, and so on are debited or credited directly by the Central Bank in participants' accounts.

Interbank liabilities deriving from the processing of payments in external net settlement systems (that is, systems operated outside the RTGS system) are settled on a multilateral net basis. These systemically important transactions are generated by other systems—namely, the check, ATM, and high-value clearing houses—to close out their business cycle and are processed daily through the RTGS system following an established schedule in the system's daily operating cycle.

Because real-time gross settlement requires greater liquidity than net settlement, participants have access to intraday credit from the Central Bank, which provides interest-free credit against a collateral in the form of either repurchase agreements (repos) (the intraday liquidity facility) or collateral pledged to the Bank (the intraday liquidity facility with pledge). If, at the close of the day, a participant's account does not have sufficient funds to repay the loan, the Bank retains control or ownership of the securities for the uncovered balance, and the participant is granted an interest-bearing overnight loan through the standing liquidity facility.

As a real-time gross settlement system with a central queue that clears payments using Central Bank money, the RTGS system provides coverage against credit risk and settlement bank risk. Payments in the RTGS system are final and irrevocable, with no possibility for subsequent action by the payment originator. The use of a delivery-versus-payment mechanism for securities transactions and a payment-versus-payment mechanism for foreign exchange transactions provides additional protection against principal risk. To reduce the need for liquidity, payments that cannot be settled immediately are placed in a centralized queue, where participants can directly manage their priorities. A gridlock resolution mechanism is automatically executed repeatedly throughout the day, so as to speed up the settlement process, while the intraday facility gives participants access to an additional source of liquidity.

The infrastructure of the RTGS system and the open market operation system, which manages intraday credit, has a high level of availability for participants. There are virtually no significant disruptions of fund transfer services, thanks to an active approach to incident management and follow-up, which supports the development of action plans as required to prevent repeat incidents and mitigate any potential effects.

Introduction

Financial infrastructure consists in the systems and arrangements through which payments are made and the transfer and transaction of financial instruments are executed. This infrastructure is what allows households, firms, and authorities to make and receive payments efficiently and safely. It also makes it possible to safely and efficiently purchase and deliver stocks, securities, and other financial instruments traded in the financial markets.

Financial infrastructure thus plays a central role in the financial system and is absolutely critical for the system's stability and functioning. This means that any problems that arise in the financial infrastructure can have serious negative consequences for the payment chain and, therefore, a potentially high cost for society. Consequently, the stability of the financial system depends on the safe and efficient operation of the underlying infrastructure, of which the High-value payment systems are an essential component.

The Central Bank regulates the High-value payment systems in Chile and manages and oversees the RTGS system, with a focus on identifying and analyzing sources of risk and efficiency losses and acting to mitigate them. The starting point for this work is the Central Bank's mandate to safeguard the normal operation of payment systems, established in its Basic Constitutional Act.

This report is aimed at financial infrastructure operators, system participants, Chilean and foreign authorities, and the general public, to provide an update on developments since the last edition of the report^{1/} and a description of the basic operating conditions of the RTGS system. On publishing this report, the Central Bank of Chile hopes that by being transparent in the performance of its duties, it can promote the ongoing improvement of the financial infrastructure and thus contribute to the country's financial stability. This edition of the report uses data available as of 31 December 2017.

I. Payment Systems

A payment system is made up of a series of instruments, bank procedures, and interbank systems for the transfer of funds, which ensures the safe circulation of money and includes both the participants and the operator of the system^{2/}. This usually implies an agreement between the system operator and participants, and the transfer of funds is carried out using an agreed-upon technical infrastructure.

In modern economies, most payments are made through movements (debits and credits) in the bank accounts of the parties to the transaction. Typically, the drawer issues an order for his bank to transfer the funds to the receiver's bank. In some cases, the receiver or beneficiary may present the payment order to the drawer's bank, or instruct his bank to do it for him. The payment instruction can take many forms, including paper (a personal check or cashier's check) or electronic communications (a debit card, credit card, or electronic transfer via Internet or mobile platforms).

^{1/} Central Bank of Chile (2012).

^{2/} BIS (2001a).

The efficient operation of the payment systems is essential for the smooth functioning of the financial markets and of the economy in general, in that it facilitates the safe and timely completion of transactions made and received by system participants—acting on their own account or for third parties—to settle all classes of monetary liabilities whether deriving from financial operations or other economic transactions. Firms use payment systems in the process of buying and selling goods and services; people, to receive their wages and pay for goods and services. Financial institutions and intermediaries use these systems to settle payments associated with operations in the money, fixed-income, stock, and foreign exchange markets. The General Treasury uses payment systems to collect taxes and other revenues, as well as to pay for goods and services and to make transfers. Finally, the Central Bank uses the payment system in its monetary policy operations and global liquidity management in the economy.

Risks in Payment Systems^{3/}

Throughout the life cycle of a payment transaction, from its submission to the system by the participant through the final settlement, financial institutions are exposed to various types of risk that can involve financial losses.

- (a) **Credit risk:** the risk of financial loss due to the counterparty's inability to meet its payment obligation, either at the time of settlement or thereafter. Credit risk depends on the size of the counterparty's liability (exposure) and increases with maturity.
- (b) **Liquidity risk:** the risk of incurring a loss in the event a payment is not received, either in full or in part, when due. The loss would occur if the expected liquidity was already committed and therefore must be acquired very quickly, resulting in higher costs.
- (c) **Legal risk:** the risk of assuming a loss as the result of an unanticipated interpretation of the system's rules or the application of a law or regulation in an unforeseen way, which prevents the transfers from being made as expected.
- (d) **Operational risk:** the risk of economic loss deriving from a breakdown in internal processes or information systems, from human error, or from external events that disrupt the normal functioning of the system. Operational risk can imply a loss of tangible assets (hardware) or intangible assets (software), as well as unexpected credit or liquidity exposures due to the impossibility of executing payments. Possible operational failures include fraud and loss or leakage.
- (e) **General business risk:** the risk of facing a loss due to inadequate management and administration by the system operator, which leads to disruptions in the reception and handling of fund transfer orders.
- (f) **Custody and investment risk:** the risk of suffering a loss on assets held in custody by the system operator or participants due to bad management by the custodian.

One of the characteristics of the financial system is the existence of a complex network of exposures among the participants, through the interbank money and capital market. By providing the infrastructure in which these market transactions are settled, the payment systems largely determine the exposure of financial institutions, which can be huge at certain times of the day. In a given event, one bank's inability to meet its obligations can

^{3/} This section is based on BIS (2012a).

have an immediate impact on the ability of other banks to meet their own obligations, which in turn can cause significant liquidity or credit problems and thus threaten the stability of the financial markets. This is called systemic risk. Depending on their design, payment systems can also determine how shocks are propagated through the financial system and how serious the contagion ultimately turns out to be. This illustrates the importance of having well-organized payment systems with solid mechanisms for controlling and containing these risks.

The potential severity of systemic effects is the reason that central banks are concerned about how the payment system is designed and organized. To provide guidelines for regulation and supervision and to support the establishment of minimum standards for risk management, it is critical to be able to distinguish between systemically important systems and other systems. A payment system can unleash or transmit systemic disruptions if it is the only available payment system in the economy or even the main system in terms of the aggregate value of the payments settled; if it processes a large quantity of payments where time is a critical factor; or if it settles payments originating in other financial market infrastructures, for example, by settling the net balances of a multilateral net settlement system or the cash leg of securities market transactions.

Although the provision of settlement services by a central bank increases the security, efficiency, and open access of the retail payment systems, operational malfunction in these systems can also have an important effect on the financial markets. Consequently, the Bank for International Settlements (BIS) has made a range of policy recommendations to promote the efficiency and security of retail payments, including market development and innovation, competition, the development of efficient infrastructures and standards, and the most efficient service delivery possible by the central bank. However, a discussion of these issues is beyond the scope of this report^{4/}.

BIS Basic Principles

The Principles for Financial Market Infrastructures (PFMI) are 24 and were developed by the CPSS in conjunction with the IOSCO, to harmonize and diffuse international best practices and legal and regulatory standards for financial market infrastructures^{5/}. These principles are oriented toward effective risk management and the promotion of efficiency and transparency. They also include five responsibilities for the authorities in charge of regulation, supervision, and oversight of the infrastructures.

The implementation of the PFMI contributes to strengthening financial infrastructures, which proved their importance in 2008 in containing the adverse effects of the financial crisis in markets where they were present, and improving the operation and integration of financial markets.

In early 2015, the Ministry of Finance and the Bank asked the World Bank and the International Monetary Fund (IMF) to evaluate local compliance with the PFMI in infrastructures that facilitate the clearing, settlement, and recording of monetary and other financial transactions, including the RTGS system. The assessment also covered compliance with the responsibilities of the authorities directly involved in the regulation and supervision of these infrastructures (namely, the Central Bank, SVS, and SBIF).

The assessment was carried out in 2015 using the CPMI-IOSCO methodology^{6/} and following the standards for a Report on the Observance of Standards and Codes (ROSC),^{7/} as are usually applied by World Bank assessors. The report was released jointly by the Bank and the Finance Ministry in late 2016.

^{4/} BIS (2003a).

^{5/} The *Principles for Financial Market Infrastructures* (PFMI) were published jointly by the BIS and IOSCO in April 2012. This publication brought together a number of international standards that had previously been published separately, increased the standards, and added Trade Repositories as infrastructure.

^{6/} BIS (2012c).

^{7/} WB (2016a).

In general, the assessment identified a high level of compliance with the principles in both the RTGS system and the other assessed infrastructures^{8,9,10,11,12/}, as well as by the authorities in terms of their responsibilities. The report concludes that the RTGS largely complies with the PFMI and is solid from an operational perspective. It is subject to comprehensive risk management, covering credit, liquidity, and operational risks. Risk management policies are clear and transparent, and the existing procedures and systems allow the measurement, mitigation, and management of the full range of risks that could arise from system operations and participants. All transactions settled in the RTGS system are final and irrevocable.

The report also contained proposals for regulatory development in terms of observance of the authorities' responsibilities, as follows: (i) the definition of a comprehensive supervisory policy for systemically important payment systems, in particular given that the supervision of *ComBanc* is based on the framework for banking supervision and thus should be revised to take into account the characteristics and risk profile of a financial infrastructure; and (ii) the uniform recognition of the PFMI by all the country's regulatory authorities.

Compliance with international standards for financial infrastructure is important for ensuring not only solid and resilient infrastructures that contribute to financial stability, but also Chile's integration with other financial markets. Consequently, the Central Bank of Chile, in consideration of both the legislative framework and the Bank's legal mandate to safeguard the smooth functioning of internal payment systems, decided to modify the *Compendium of Financial Regulations* to incorporate a new Chapter III.H, entitled "Payment Systems," which establishes that the real-time gross settlement (RTGS) system and the domestic-currency high-value clearing house (LVCH) must observe the Principles for Financial Market Infrastructures and must periodically assess their compliance thereof, as stipulated in Board Resolution 2119E-01-171228 of December 2017. To this end, these payment systems must prepare a self-assessment report verifying observance of these principles, in accordance with the disclosure framework established in the report *Principles for Financial Market Infrastructures: Disclosure Framework and Assessment Methodology*, which must be submitted to the Central Bank and the SBIF annually or in the event of material modifications^{13/}. In this sense, the principles will be an integral part of the regulations issued by the Bank in fulfillment of its mandate to regulate the operation of authorized payment systems. The entities responsible for managing these systems must comply with this regulatory framework, and their compliance is subject to an annual audit.

The aforementioned accreditation of compliance with the principles is effective as of 4 January 2018, and the first disclosure framework report must be submitted to the Central Bank of Chile and the SBIF no later than 31 March 2018.

The financial market infrastructures that are subject to observance of the PFMI include the payment systems, the securities settlement systems, central counterparties, central securities depositories, and trade repositories, and the responsibilities or roles of the respective authorities in terms of regulating, supervising, and monitoring these infrastructures have been clearly outlined. For illustrative purposes only, a brief description is provided below of other internationally recognized financial market infrastructures that perform key functions directly associated with the payment systems:

Central securities depositories (CSD): Provide securities accounts, centralized custody services, and other services related to these assets. In Chile, these services are provided by the *Depósito Central de Valores S.A.* (DCV), which is regulated and supervised by the Financial Market Commission (FMC) and governed by Law 18,876.

^{8/} WB (2016b)

^{9/} WB (2016c)

^{10/} WB (2016d)

^{11/} WB (2016e)

^{12/} WB (2016f)

^{13/} BIS (2003c).

Securities settlement systems (SSS): Facilitate the transfer and settlement of securities through a book-entry system according to a set of multilateral rules. In Chile, this service is provided by the securities clearing house, *Cámara de Compensación y Liquidación de Valores*, managed by *CCLV Contraparte Central*, which operates in the fixed-income and securities markets. This entity is regulated and supervised by the FMC and governed by Law 20,345 on securities clearing and settling. Additionally, under Article 10 of that law, the FMC requires prior approval from the Central Bank of Chile on issues that fall under the scope the Bank's authority when establishing operating rules for this entity.

Central counterparties (CCP): Coordinate contracts negotiated by counterparties in one or more financial markets, becoming the buyer for all sellers and the seller for all buyers and thus ensuring fulfillment of all open contracts. In Chile, there are two CCPs: *CCLV Contraparte Central*, which operates as the CCP in the fixed-income and derivatives markets; and *ComDer Contraparte Central*, which operates in the OTC derivatives market. These entities are regulated and supervised by the FMC and governed by Law 20,345, under the aforementioned terms.

Trade repositories (TR): Maintain a centralized electronic record (database) of transaction data. Their main functions are data collection, storage, and dissemination.

Relative to the standards they replaced (BIS 2001a, 2001b, and 2004), these principles strengthened the guidelines on credit and liquidity risk management to make financial infrastructures more resistant to financial crises and, in particular, to participant default. Equally importantly, they also provide more detailed guidelines on good governance of infrastructure operations, to manage the risks associated with varying degrees of tiering (direct and indirect participation) and to place greater emphasis on transparency.

II. Institutional and Organizational Framework

In accordance with Section 3 of the Central Bank's Basic Constitutional Act, the objectives of the Bank include safeguarding the currency and the normal functioning of internal and external payments^{14/}. These objectives are not completely independent due to the interrelation of price stability and financial stability. The stability of the currency is one of the basic conditions for the smooth functioning of the payment system, which also reflects the incentives, regulations, and infrastructure that support the financial system's operations. To fulfill its objectives in this area, the Bank continuously monitors the international capital markets and the national financial sector, seeking to identify phenomena that could have a material effect on financial stability in the short or medium term. Another contributing factor is the design and implementation of policies that promote the secure and efficient operation of financial market infrastructures, including the payment system.

The importance of the latter issue lies in the fact that one of the main components of the payment system, in addition to cash in circulation, is demand deposits held at banks, which are the most common instruments used by local economic agents for executing their transactions. Therefore, a failure in the normal functioning of the systems that facilitate the transfer of this "bank money" would affect the full payment chain, causing significant damage to the economy. Another component is the reserves held by commercial banks at the Central Bank, which are transferred between the financial institutions using the existing infrastructure of the payment system. Consequently, a well-functioning payment system is a basic prerequisite for monetary policy effectiveness, which requires the orderly and timely settlement of transactions and an efficient distribution of liquidity.

^{14/} Central Bank Basic Constitutional Act (Law 18,840).

To prevent disruptions, the Central Bank's Basic Constitutional Act gives the Bank the authority to regulate the financial system and the capital market, to the extent necessary to fulfill its legal mandate with regard to price stability, financial stability, and systemic risk. With the modification of Section 35, N° 8, of its Basic Constitutional Act^{15/}, the regulatory framework of the payment infrastructures and their interconnection with other jurisdictions were strengthened by giving the Central Bank the power to authorize and regulate payment systems established in Chile, which are used by banks and other financial institutions supervised by the SBIF for the acceptance, clearing, and settlement of payment orders associated with monetary obligations, whether in national or foreign currency. Section 35, N° 8, also legally establishes the final settlement of payments. Specifically, the section stipulates that operations carried out in accordance with the rules of a regulated or recognized payment system, including systems created and managed by the Bank, will be final, that is, definitive, irrevocable, binding for participants, and enforceable for third parties. These operations include, but are not limited to, payments, transfers, and credits or debits to an account instructed by a participant, including the operator of the payment system, in relation to the clearing and/or settlement of payment orders, collateral arrangements, and loss-sharing agreements. Therefore, any declaration of invalidity, unenforceability, ineffectiveness, challenge, resolution, revocation, suspension, prejudicial or precautionary measure, prohibition or embargo, action for recovery or other limitation of domain, or any other act or decision, whether judicial, administrative, or of any other nature, including in the event of insolvency, forced liquidation, or any other cause, that seeks or attempts to limit or restrict the aforementioned operations, will not in any way affect the final settlement of the transactions.

Consequently, the regulatory power of the Central Bank of Chile encompasses a wide range of actors in the financial system, including banks, savings and loan associations, pension funds, clearing houses, and, more generally, payment service providers. In the case of banks, the Central Bank issues directives that regulate liquidity positions and market risks, which are related to the functioning of the system as a whole^{16/}. In exercising its authority, and in establishing the general conditions applicable to central bank accounts, the Central Bank has set out the regulations for the real-time gross settlement (RTGS) system in the *Compendium of Financial Regulations*, which also contains regulations issued by the Bank on other issues affecting the functioning of the payment system, such as the authorization and operation of the check, ATM, and high-value clearing houses and the issue and operation of credit and debit cards. Additionally, Chapter III.H.4: "The Central Bank of Chile's Real-Time Gross Settlement System (RTGS System)" and Chapter III.H.4.1: "Operating Rules for the RTGS System" in the Bank *Compendium of Financial Regulations* establish, at the regulatory level, that once a fund transfer instruction or any other operation indicated therein has taken effect, it is final and irrevocable and, therefore, cannot be annulled, revoked, reversed, cancelled, or modified. In this area, the general conditions applicable to current accounts that the Central Bank can open for financial clearing and settlement system operators governed by Law 20,345 were modified, effective July 2015, and changes were introduced to the aforementioned Chapters III.H.4 and III.H.4.1 of the *Compendium of Financial Regulations*, to allow the opening of additional or accessory central bank accounts and settlement accounts in the RTGS system, for holding cash collateral required by the law. Furthermore, as mentioned, Chapter III.H of the *Compendium of Financial Regulations*, on payment systems, entered into force in 2018 to expressly require observance of applicable PFMI in the high-value payment systems (the RTGS and LVCH systems), thus promoting their operation in accordance with international standards.

Finally, the *Compendium of Monetary and Financial Regulations* stipulates the requirements on cash holdings and technical reserves, as well as access to the liquidity facilities that the Central Bank regularly offers to financial institutions for the purpose of liquidity management and control, including the intraday liquidity facility and the intraday liquidity facility with pledge.

^{15/} The current text of this regulation was established by Art. 7 of Law 20.956, published in the *Official Gazette* on 26 October 2016.

^{16/} Marshall (2012).

General Objectives of Regulation

As part of its role, the Central Bank promotes the development of the payment system following the relevant international standards contained in the PFMLs, in accordance with its constitutional objective to safeguard the normal functioning of the internal and external payment systems. The timely and secure completion of transactions is an essential condition for the smooth functioning of financial markets and the economy as a whole. In that context, the regulation of the payment system aims to foster high standards of security and efficiency, with a focus on containing or minimizing the implicit risks: (a) credit or counterparty risk; (b) liquidity risk; (c) operational risks deriving from technical failures or operating errors; and (d) legal risk associated with legal uncertainty. As mentioned, a particular concern is systemic risk, that is, the risk that the inability of one participant to meet its payment obligation on time could result in other participants being unable to meet their own obligations, producing a chain reaction that affects the rest of the economy.

In addition to the reliability or security of payment systems and its impact on the stability of the financial system, the regulatory framework operates on the assumption that the costs deriving from the established arrangement for clearing and settlement, as well as the operational structure, the range of products cleared and settled, and the technology used, should be reasonable, so as to avoid creating incentives for participants to use an alternative scheme that exposes the financial system and the economy in general to greater risks.

Internal Organization

The institutional arrangements within the Central Bank aim to satisfy the requirements for autonomy and corporate governance that foster the adequate implementation of the design and management of the high-value payment system, delimiting decision making responsibilities by both hierarchical level and area of responsibility. To this end, operational and regulatory aspects are clearly separated, while focusing on strengthening the system's infrastructure and reducing the most important risks, in accordance with international principles.

At the top of the hierarchy is the Central Bank's Board, whose responsibilities include safeguarding the normal functioning of the internal and external payment systems. In line with this objective, the Board promotes the efficient and secure operation of the high-value payment systems, ensuring that they comply with the standards and recommendations of the CPSS (now the BIS Committee on Payments and Market Infrastructures, CPMI) and approving the associated regulations, operating rules, and mechanisms for interacting with other systemically important infrastructures^{17/}. The CPSS principles are included on the list of "key standards" for a stable, robust, and well-functioning financial system issued by the Financial Stability Board. Their implementation is thus a priority, with some flexibility depending on the specific circumstances of a given country. While these standards are not mandatory, they are widely considered to represent minimum requirements for good practices that should be met or exceeded.

The second hierarchical level comprises the Financial Markets Division (FMD) and the Financial Policy Division (FPD). The former is responsible for making proposals to the Board and General Management with regard to plans and policies for the provision of securities clearing and payment services for the financial system. It also coordinates and supervises the management of high-value payment services and the corresponding intraday liquidity facilities for the financial system, in accordance with its systemic importance. The latter (the FPD) is responsible for advising the Board and General Management on monitoring, prioritizing, and evaluating the key risks to financial stability and the normal functioning of the internal and external payment, including the formulation of policies, regulations, and other initiatives oriented toward strengthening the financial system and capital market infrastructure, as well as the formulation and assessment of policies relating to the internal and/ or external payment systems.

^{17/} Central Bank of Chile (2000).

The third hierarchical level includes the Payment Systems and Operations Management (PSOM), within the FMD, which defines the strategy for implementing the management policies on the provision of high-value payment services and for executing the daily management, business continuity, and risk management of the payment systems operated by the Bank. The Payment Systems and Settlement Department (PSSD), in the PSOM, is responsible for managing the daily operating cycle of the real-time gross settlement (RTGS) system, including the application of the available contingency mechanisms, and implementing approved operating decisions. At the same hierarchical level as the PSOM, the Financial Infrastructure and Regulation Management (FIRM), in the FPD, contributes to the formulation and assessment of policies and regulations for the internal and external payment systems, to promote the efficient and secure operation of the financial system and capital market.

The Comptroller and Auditor General of the Central Bank, which reports directly to the Board, assesses the regulatory compliance of the RTGS system's operating cycle, the existence of an adequate internal control framework for local-currency payment operations, and the security of information technology applications and infrastructure, as well as various aspects of governance, risk management, data management, and communications. At the same time, the Audit and Compliance Committee (ACC), an advisory committee to the Board, reports on the efficacy of the internal control procedures and systems used by the Bank in relation to the RTGS system and assesses the equity effects and reputational risks involved in compliance with the Bank's obligations, especially in terms of rules and standards associated with the risks faced by the Bank.

The Strategy and Risk Department, in the Strategic and Operational Risk Management (SORM), participates in risk identification, analysis, evaluation, and treatment in the high-value payment system and intraday liquidity facilities, using probability and impact assessment, and evaluates the respective controls in terms of their effectiveness for reducing the impact and probability of occurrence. This department also monitors action plans associated with the risk management and business continuity systems, including the evaluation of periodic tests for ensuring that the mechanisms established for facing contingency situations work as intended.

The Financial Markets Division Director and the Financial Policy Division Director meet quarterly with the managers of the Financial Infrastructure and Regulation Management, Information Systems Management, National Markets Management, and Payment Systems and Operations Management, the head of the PSSD, and a representative of the Office of the General Counsel, to review the operation of the RTGS system with regard to settlements, coordination, the application of contingency mechanisms, and any other important developments in this system. This committee, called the RTGS System Supervisory Committee, is chaired by the Financial Markets Division Director, while the technical secretariat is located in the PSOM, which is in charge of organizing the committee and reporting on the RTGS system operations. The General Manager is sometimes also present at committee meetings, depending on the topics on the agenda.

In the semiannual *Financial Stability Report*, the Financial Policy Division reports on policies and measures related to the normal functioning of the internal payment systems, to promote public awareness and debate on the Central Bank's actions in fulfilling this function. In the report, the chapter on "Financial Regulation and Infrastructure" reviews financial regulation initiatives both in Chile and overseas, while the chapter on "Payment Systems" reviews the operation, main statistics, and developments in the payment systems and infrastructure that support the functioning of the financial markets.

Finally, since 2007, the *Annual Report* provides information on the RTGS system and is available for access by the general public on the Central Bank of Chile's website. The information in the *Annual Report* is intended to provide a vision on the implementation and development of the payment system operated by the Bank, presenting details on the basic operating rules and characteristics, initiatives for strengthening operations and improving response capacity under different scenarios, and the main statistics confirming its systemic importance.

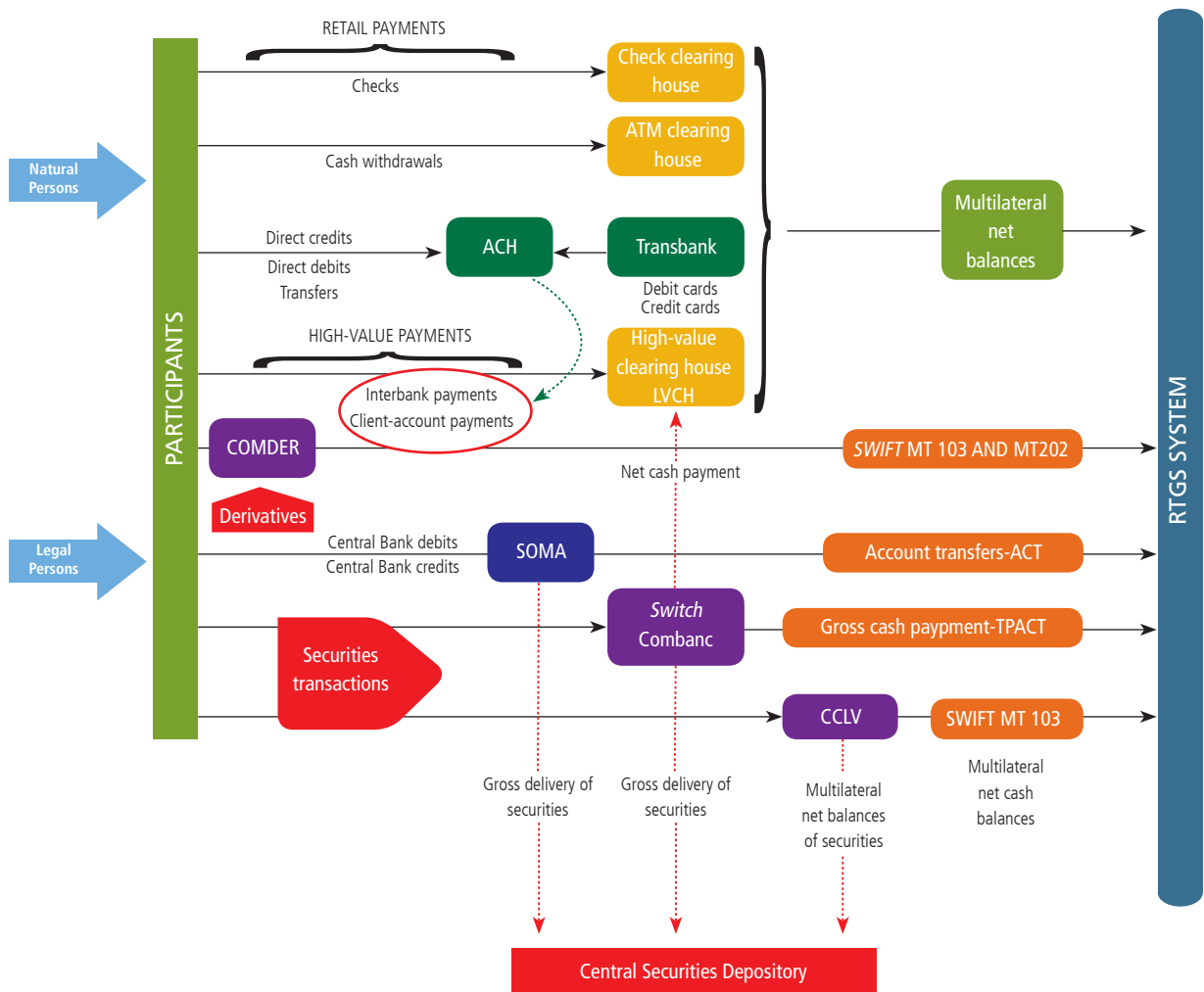
III. Real-Time Gross Settlement (RTGS) System

The Central Bank of Chile’s real-time gross settlement (RTGS/CAS) system is an electronic payment system operating in local currency (Chilean pesos) since April 2004, through which participants can transfer funds to other participants and settle other transactions allowed under Central Bank regulations. This system makes up the core of the Chilean payment system (diagram).

The RTGS system runs on the LCSS/CAS application (Logica Clearing and Settlement System/Central Accounting System) developed by Logica UK, which was acquired by the CGI Group in 2012. The system was implemented to enhance the efficiency and security of the high-value payment system, eliminating the credit risk associated with the deferred net settlement of high-value interbank payments. The RTGS system is owned, regulated, and operated by the Central Bank of Chile in accordance with Sections 3 and 35 N° 8 of the Bank Basic Constitutional Act; the specific regulations are contained in Chapters III.H.4 and III.H.4.1 of the *Compendium of Financial Regulations*. This system provides settlement services, while communications take the form of Swift payment messages (MT103, MT202, and MT205), which are characterized by their high availability, traceability, and standardization. Unlike netting systems, the RTGS system settles payments individually and immediately on reception of the payment order, provided the issuer has the available funds to cover the payment in question. Payments in the RTGS system are typically credit transactions, that is, payments are initiated by the issuer (debtor).

Diagram

The Payment System in Chile



Source: Central Bank of Chile.

The diagram presents a stylized illustration of the relationships between the main actors in the Chilean payment system. The retail (or low-value) payment systems—which are used to make payments and transfer funds between natural and/or legal persons—process a large number of relatively small individual transactions, normally associated with the purchase of goods and services. These payments are made using a variety of instruments, such as checks, automated teller machines (ATMs), cash, credit cards, debit cards, prepaid debit cards, and electronic transfers. The first two—checks and ATMs—are settled daily in the RTGS system based on the net balance of each participant, determined in specialized clearing houses, while direct credits and debits, such as transfers, are settled on a bilateral net basis, which is determined twice a day by the automated clearing house (ACH), through fund transfers settled in one of the high-value payment systems (the RTGS or LVCH) designated by the issuing bank.

Pursuant to Section 35 N° 7 of the Central Bank Basic Constitutional Act and Law 20,950, the Bank has established regulations on the operation of credit, debit, and prepaid debit cards, contained in Chapters III.J.1 and III.J.2 of the *Compendium of Financial Regulations*.

Additionally, under Section 35 N° 8 of its Basic Constitutional Act, the Central Bank also regulates the following retail payment systems: the clearing house for checks and other documentary drafts in local currency, treated in Chapter III.H.1 of the *Compendium of Financial Regulations*; and the clearing house for transactions made using automated teller machines, addressed in Chapter III.H.3 of the abovementioned *Compendium*.

The high-value payment system (LVPS), comprising the RTGS system and the LVCH system, allows the transfer of systemically large funds and payments in domestic currency between participants of a given system. The RTGS system settles transactions individually and immediately on receipt of a payment instruction, on condition of sufficient account balances, settling the gross transactions in the accounts of each participant bank. The LVCH system processes settlements once a day: at the end of the business cycle, the net balances of each bank are determined, which are then settled through the RTGS system, in the accounts of each participant. The LVCHs are managed by private entities that act as Clearing House Operators, in compliance with the provisions of Section 35 N° 8 already cited and Chapter III.H.5 of the *Compendium of Financial Regulations*, which must be legally constituted in the country as a banking services support corporation, under the terms established in Article 74 of the General Banking Law and in compliance with the general rules issued by the Superintendence of Banks and Financial Institutions SBFI, which is in charge of overseeing these entities.

Both systems (RTGS and LVCH) process interbank and client-account transactions and over-the-counter (OTC) securities market transactions. The latter are processed under a delivery-versus-payment (DVP) model, whereby the transfer of securities in the CSD is synchronized with the simultaneous payment. This gross settlement of funds and securities, which is managed by ComBanc, is also known locally as the Switch mechanism.

The payments settled in the RTGS system include the net sums deriving from settlement processes in the securities clearing house (managed by CCLV *Contraparte Central*) originating in the securities exchange (debt securities and time deposits) and the net sums deriving from central counterparties (*ComDer* in the case of OTC currency and interest rate derivatives and CCLV in the case of stocks and exchange-traded derivatives), in accordance with the provisions of Law 20,345, which authorizes the Central Bank to open central bank accounts for these entities, in their role as Financial Instrument Clearing House Management Corporations.

Finally, the Central Bank, in its role of system manager and participant, settles its own payment instructions, mainly in relation to the implementation of monetary policy and the distribution of cash, through direct debits and credits in settlement accounts associated with system participants' central bank accounts.

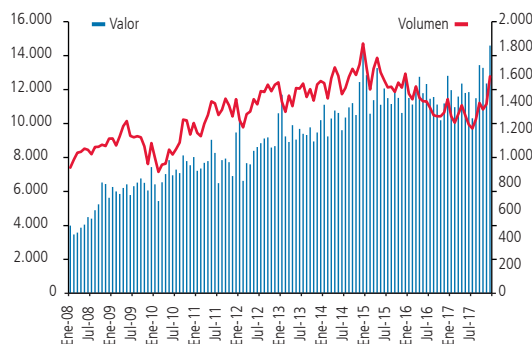
All payments in the RTGS system are settled in the participants' central bank accounts, maintained at the Central Bank of Chile, simultaneously debiting the sender's account and crediting the receiver's account, after which the payment is final and irrevocable. As the result of the continuous settlement of individual payments in the RTGS system, participants have large intraday liquidity requirements. Participants can manage their own outgoing payments, but generally they cannot know with certainty when they will receive incoming payments. It is therefore essential for the system to have sufficient liquidity to operate efficiently.

Activity in the RTGS system has increased steadily in recent years, in terms of both the average daily volume and value of payments processed. The trend peaked in late 2014, after which daily activity slowed and then stabilized (figure 1).

Figure 1

Payments settled in the RTGS system.

(Ch\$ billion)



Source: Central Bank of Chile.

System Participants

The Central Bank, as a supplier of high-value payment services, operates the RTGS system and also settles its own fund transfer instructions, such that it acts as both system manager and participant. All banks authorized to operate in the country by the Superintendence of Banks and Financial Institutions can request permission to participate in the RTGS system, on meeting the established requirements, as can management corporations that act as central counterparties or financial clearing houses, constituted under the current legislation (Law 20,345). In the latter case, however, the Central Bank confers participant status in the RTGS system for the sole purpose of allowing the respective corporation to settle the net credit or debit balances deriving from the financial clearing and settlement systems under their management, when this settlement must be effected through the RTGS system in accordance with the stipulations of the operating rules applicable to these entities, pursuant to Law 20,345. At the same time, the aforementioned rules further specify that this in no way implies the provision of financing or refinancing facilities, nor any other guarantee on the part of the Central Bank, with regard to the operations being settled.

Participant status in the RTGS system is subject to prior approval and verification of the following by the Central Bank of Chile:

- (a) A current account in domestic currency must be opened at the Central Bank of Chile.
- (b) The corresponding request for participant status and the "RTGS System Accession Agreement" must be signed and submitted, wherein the participant expressly accepts all the rules and conditions governing the system, including the system's operating regulations and any subsequent modifications.
- (c) The participant must be a member of SWIFT (due to the fact that the RTGS/CAS system uses SWIFT messages) with its own Bank Identifier Code (BIC) and must have satisfactorily exchanged message authentication codes.
- (d) All participants in the RTGS system are also required to be members of the closed user group created in SWIFT for the purpose of operating the RTGS system.
- (e) The option to send Fin-Copy messages in SWIFT must be enabled.
- (f) Participants must have access to the Central Bank of Chile's private communications network and the SINACOFI communications network.
- (g) All participants must have performed a successful round of tests to verify that they are technically capable of sending and receiving messages with the system and that they can access the private communications network managed by the Central Bank.

The Financial Market Commission (FMC) supervises and monitors the management corporations governed by Law 20,345, and the SBIF supervises and monitors the banks under the General Banking Law (GBL). The Central Bank monitors the requirements and conditions that it can directly observe, in accordance with its authority. The regulatory guidelines further establish that the Bank has the authority to revoke participant status and the corresponding authorization to operate in the RTGS system, in the event that an entity seriously or repeatedly breaches, or no longer meets, the participation requirements; does not comply with the provisions of Law 20,345 or the respective operating rules for management corporations; or carries out actions that put at risk the normal functioning of the RTGS system, other payment systems, or the stability of the financial system; in which case the Central Bank will also proceed to close the respective central bank account, in accordance with the applicable general conditions. In such situations, the Central Bank will communicate its decision in advance to the SBIF or the FMC, as appropriate.

The Central Bank of Chile can suspend a participant's status in the RTGS system for up to 90 days in the event of a breach of the regulations established in the operating rules or repeated technical failures or other problems that affect the participant's connection or communication capacity. In that case, the Central Bank will inform the SBIF, in the case of banks, or the FMC, in the case of management corporations, in advance of implementing the decision. During the period of suspension, the participant will be allowed to operate in the RTGS system solely under the conditions and means established by the Central Bank and only for operations that the Bank has expressly authorized.

As of December 2017, there were 22 direct participants, including all banks, the securities clearing house (CCLV), and the derivatives clearing house (*ComDer*). The number of participants has been relatively stable in the last five years, with a small reduction in the number of banks in recent years (table 1). There is no indirect participation in the RTGS system.

Table 1

Number of participants in the RTGS system
(31 December of each year)

	2012	2013	2014	2015	2016	2017
Central Bank of Chile	1	1	1	1	1	1
Banks	24	23	23	24	23	20
Central counterparties and securities and derivatives clearing houses (Law 20,345)	1	1	1	2	2	2

Source: Central Bank of Chile.

Transactions

The payment system is designed as a real-time gross settlement system for high-value interbank payments and for payments in which the precise moment of settlement is highly critical. The transactions processed by the RTGS system include client-account payments and own-account interbank payments, both issued by the same participants, with the value date between 9:00 a.m. and 5:30 p.m., as well as delivery-versus-payment (DVP) fund transfers for settling the cash leg of securities transactions. The latter are issued by a banking services support corporation called the high-value Clearing House (*Cámara de Compensación de Alto Valor*, or *Switch*, operated by *ComBanc*), which is responsible for synchronizing the delivery of the securities and the cash in the secondary market. Any fund transfer instructions that are in the queue can be modified in terms of priority by the sender, who can change the location of payments in the queue until funds become available in the account; queued payments can also be cancelled, but only while they are still in the queue. After 5:30 p.m., the RTGS system will reject from the queue any fund transfer instruction scheduled for the day that has not been cancelled by the sender. For all legal and regulatory purposes, the rejection will be understood as cancellation by the sender.

Central Bank transactions corresponding to the settlement of open market operations, standing deposit and lending facilities, treasury operations (cash withdrawals and deposits), and so forth are debited or credited directly by the Central Bank in participants' accounts until 6:15 p.m.

Payments with a future value date (up to seven days) are stored in the system. These instructions can be cancelled by the issuer as long as they have not been settled. The relatively low number of payments is explained by banks' preference for channeling smaller payments through the LVCH, leaving only their largest payments to be settled in the RTGS system.

Tables 2 and 3 provide details on the daily operating cycle and the value and volume of settlements in the RTGS system, respectively.

Table 2

Daily operating cycle of the RTGS system

Time	Activity
8:30	Start of business
9:00	System opens for settling fund transfer instructions (FTIs) sent by participants. System opens for settling account transfers sent by the Central Bank. Intraday liquidity facility opens (ILF).
16:00	Start of net settlement process from the check clearing house in Chilean pesos (Ch\$).
16:30	Start of net settlement process from the ATM clearing house.
17:00	Start of net settlement process from the large-value clearing house in Chilean pesos (Ch\$).
17:15	Cut-off time for entry of FTIs sent by participants for client accounts. Cut-off time for entry of FTIs sent by third parties. Cut-off time for intraday liquidity facility.
17:30	System closes for settlement of FTIs sent by participants for own accounts. System closes for settlement of FTIs sent by participants for client accounts. System closes for settlement of FTIs sent by participants a third party.
17:30 - 17:40	Central Bank executes charges to participants' accounts for repos in the intraday liquidity facility.
18:15	Close of Central Bank operations.
18:30	Close of the RTGS system.

Source: Central Bank of Chile.

Table 3A:

Value settled in the RTGS system (Ch\$ million).

	2012	2013	2014	2015	2016	2017
Payments settled in the RTGS system	8,654,864	9,641,494	10,943,558	11,711,676	11,647,792	12,219,478
Fund transfer instructions	3,646,979	4,478,375	5,005,739	5,442,649	5,382,326	6,332,800
Interbank	1,252,001	1,432,914	1,664,758	1,929,862	1,555,333	2,021,440
Client-account	1,661,130	2,031,557	1,998,381	2,057,759	2,147,553	2,198,783
Delivery versus payment (DVP)	733,848	1,013,904	1,342,600	1,455,028	1,679,440	2,112,577
Clearing houses	307,788	321,023	316,671	322,764	299,854	293,927
Checks	62,637	60,936	61,349	60,256	57,262	53,457
ATMs	13,537	15,054	17,115	17,257	18,782	18,934
High-value	231,614	245,033	238,207	245,251	223,810	221,536
Central Bank of Chile	4,700,097	4,842,096	5,621,148	5,946,263	5,965,612	5,592,751
Intraday liquidity facility	970,772	1,200,313	1,337,841	1,244,009	929,342	1,686,280
Open market operations	3,729,325	3,641,783	4,283,307	4,702,254	5,036,270	3,906,471

(*) Daily averages for each year.

Sources: Central Bank of Chile.

Table 3B

Volume settled in the RTGS system

	2012	2013	2014	2015	2016	2017
Payments settled in the RTGS system	1,417	1,468	1,598	1,577	1,393	1,343
Fund transfer instructions	1,168	1,220	1,352	1,344	1,175	1,126
Interbank	486	487	524	522	439	443
Client-account	585	623	667	640	546	515
Delivery versus payment (DVP)	97	110	161	182	190	168
Clearing houses	56	56	56	55	51	46
Checks	23	23	23	22	20	17
ATMs	13	13	13	13	13	13
High-value	20	20	20	20	18	16
Central Bank of Chile	193	192	190	178	167	171
Intraday liquidity facility	30	33	27	25	20	20
Open market operations	163	159	163	153	147	151

(*) Daily averages for each year.

Sources: Central Bank of Chile.

The system handle transactions regardless of unitary value, since there are no restrictions in terms of minimum amount. A payment is initiated when a participant sends a SWIFT message to the recipient, which is captured and retained by the SWIFT FIN Copy service. This service transmits a partial copy of the payment message to the RTGS system with the following details: sending participant, receiving participant, transaction reference number (TRN), value date, currency, and transaction amount. The RTGS system checks the message format and verifies whether there are sufficient funds in the sender's account to settle the payment in real time, transferring funds between the settlement accounts. The Central Bank can execute debits and credits directly in the participants' accounts through account transfers.

Settlement of External Netting Systems

Interbank obligations deriving from the settlement of retail payments, as well as the close of the business cycle in the high-value clearing house, are settled based on multilateral net positions in the RTGS system, at a scheduled time in the system's daily operating cycle. Multilateral netting is a settlement process in which individual payments between participants are compared against all other participants' obligations to obtain a final net balance for settling. Under this system, there is a lag between the recording and processing of individual payment orders and the determination of the final net balances by the system, on the one hand, and the settlement of the net balances in the corresponding central bank accounts, on the other; hence the term, Deferred Net Settlement (DNS) systems. The resulting net position is reported electronically to each participant in advance of the start of each settlement cycle, so that participants can ensure that the necessary funds are available in their accounts and thus avoid disruptions due to lack of funds.

- The check clearing house, for checks and other bank drafts in domestic currency, allows paper-based payment instructions to be exchanged, netted, and settled between banks established in the country. This clearing house is managed by the private corporation *Sistema Nacional de Comunicaciones Financieras S.A.* (Sinacofi). The settlement process starts at 4:00 p.m.
- The corporation Redbanc S.A. manages Chile's network of automated teller machines (ATMs), where bank customers can withdraw cash in domestic currency from any ATM, irrespective of the bank in which they hold an account. The netting of ATM transactions in the country is validated and sent by Sinacofi, for settlement starting at 4:30 p.m.

(c) The LVCH is a deferred net settlement system in domestic currency, operated by the *Cámara de Compensación de Pagos de Alto Valor S.A.* (ComBanc S.A.), which continuously calculates the bilateral and multilateral net positions of participants in accordance with the payment instructions received for own-account and client-account transactions, while applying in real time the corresponding bilateral limits (the maximum net credit balance that a given participant is willing to grant to any other participant during a business cycle) and multilateral limits (the maximum net debit balance, established by *ComBanc*, that a given participant can carry at any time vis-à-vis all other participants during a business cycle). The LVCH has a mechanism for depositing collateral in the Central Bank at the start of the day to ensure settlement, which begins at 5:00 p.m. Once the settlement process is finalized in the RTGS system, the clearing house operator automatically sends a request to the Central Bank to transfer the participants' collateral to their respective settlement accounts in the RTGS system.

Once the settlement process has been initiated, the RTGS system tries to reserve the total value required in each account with a net debit balance. Because reserve requirements have a higher priority than payments, an uncovered reserve requirement will block the settlement queue until the full requirement is met. Once all the debit positions are fully covered, the RTGS system applies all the reported debits and credits.

Once the settlement process has been initiated and after the period of time indicated in the operating rules for the RTGS system, if one or more participants with a net debit balance does not have sufficient funds to meet their payment obligation, the Central Bank can suspend the net settlement process until all the participants involved resolve the situation, which must be rectified no later than one hour after the closing of the RTGS system.

Intraday liquidity facility

To settle every transaction on a real-time gross basis, participants must have the necessary funds in their central bank account at the time the payment is processed. In order to promote an efficient use of liquidity within the system and to minimize potential gridlocks, the Central Bank provides additional liquidity through access to intraday credit from the intraday liquidity facility (ILF), which is provided interest free against the delivery of collateral in the form of same-day repurchase agreements, with the due transfer of the securities to the Bank; or, alternatively, since November 2017, through access to an intraday credit line from the intraday liquidity facility with pledge, which is also provided interest free against the provision of securities pledged to the Bank within the same day. The provision of these lending facilities contributes to shorter queues and faster settlement. There is no intraday liquidity market in Chile.

There is no limit on the number or amount of intraday loans that an individual participant can request, provided they are backed by dematerialized securities, which are electronically transferred or pledged to the Central Bank's position account at the CSD, under delivery-versus-payment (DVP) principles, using the SOMA system. If, at the end of the day, a given participant does not have sufficient funds to repay the intraday credit, the Central Bank retains ownership of the securities for the uncovered balance, and the transaction is automatically converted to an overnight loan through the standing liquidity facility or the collateralized standing liquidity facility, as appropriate, at an interest rate equivalent to the monetary policy rate (MPR) plus 25 basis points (bp).

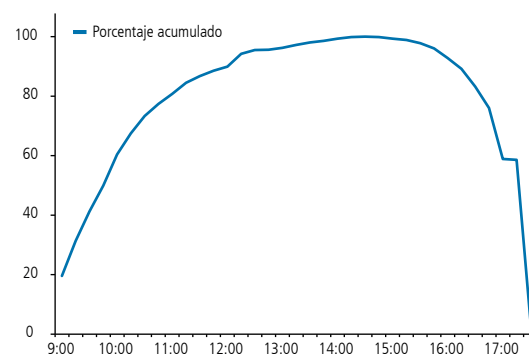
The technological platform for processing requests for the ILF and the pledged ILF is provided by the open market operations system (SOMA), which is owned and operated by the Central Bank and is available from 9:00 a.m. to 5:15 p.m. The system operates on the DEPO/X application developed by CMA Small Systems AB. It was implemented in late 2015 to modernize the previous platform, which, due to its age, represented an increasing

operational risks for participants. Moreover, the PFMI encourages the adoption of international standards in communications to facilitate interconnection, which was further addressed through the adoption of SWIFT messaging for transfer instructions and collateral pledging of eligible securities. Participating banks can choose the moment at which funds are repaid, within the aforementioned window. In the event that the participant has not repaid the full amount borrowed from the ILF or the pledged ILF, the amount pending is automatically repaid by the SOMA system, starting at 5:30 p.m.

The intraday pattern of liquidity injection from the ILF and the pledged ILF shows that participants of the RTGS system quickly increase their liquidity after the start of the business day: around 50% of the total value of their daily operations is completed by 10:00 a.m., while 80% of the total is reached an hour later (figure 2). Over the rest of the day, liquidity continues to rise until it peaks between 2:30 and 2:45 p.m. Approximately 58% of repurchases in the ILF and the pledged ILF are automatically instructed by the SOMA system after closing. Finally, the use of the ILF and the pledged ILF is concentrated in a small number of institutions: in 2017, four banks accounted for around 78% of the total.

Figure 2

Intraday pattern of liquidity from the ILF and pledged ILF (*)
(percent, every 15 minutes)



(*) Percent of maximum liquidity drawn. Daily average in 2017.

Source: Central Bank of Chile.

In accordance with legal provisions, access to intraday credit is limited to bank participants and cannot be extended to participants that are securities clearing and settlement system management corporations. Access requires signing a contract with the Central Bank (SOMA contract), which further includes the following: (i) in the case of the ILF, an access application, which identifies the securities depository company and the deposit account number maintained at that company; and (ii) in the case of the pledged ILF, a signed contract by the bank opening a liquidity line of credit in domestic currency backed by pledged collateral, including a special mandate transferring the securities pledged in guarantee. In both cases, the participant must meet the technical requirements and carry out prior connection tests.

In the case of the ILF, eligible collateral includes securities issued by the Central Bank of Chile, as well as fixed-income securities issued by banks with a credit rating equal to or higher than stipulated in the financial conditions, including letters of credit, promissory notes or time deposit certificates, and mortgage bonds. For the pledged ILF, eligible collateral includes securities issued by the Central Bank and the General Treasury, as well as fixed-income securities issued by banks with a credit rating equal to or higher than stipulated in the financial conditions,

including letters of credit, promissory notes or time deposit certificates, and mortgage bonds. Securities bought by the Central Bank with a repurchase agreement for ILF operations or that are pledged as collateral by banks for pledged ILF operations cannot come due during the respective operation or up to three bank business days later, with the exception of fixed-income securities issued by banks, where the minimum residual maturity is five bank business days. Securities are valued at their benchmark price on the previous day, with an initial margin of 101% over eligible securities, less specific discounts (haircut) depending on the eligible security and its residual maturity, in order to adequately manage market risk deriving from asset price fluctuations.

Section II of Chapter N° 2.1 of the *Compendium of Monetary and Financial Regulations* and Circular Letter 591, dated 15 November 2017, outline the general operating conditions under which participants, namely, banks, have access to the intraday liquidity facility (ILF) provided by the Bank. Similarly, Section II of Chapter N° 2.3 of the same *Compendium* and the aforementioned Circular Letter outline the general operating conditions under which participants, namely, banks, have access to the intraday liquidity facility with pledge, also provided by the Bank. In both cases, the objective is to facilitate the operational liquidity of the RTGS system.

Cost Recovery and Rate Policy

The Central Bank's rate policy for RTGS services is outlined in Chapter III.H.4 of the *Compendium of Financial Regulations*. It is intended to cover the costs associated with the implementation, operation, and maintenance of the system, including the following: (i) the opportunity cost of the resources invested in setting up the system and in subsequent improvements; (ii) system operating and maintenance costs, including hardware and software support contracts, network and connectivity contracts, and personnel expenses directly involved in operation and maintenance; and (iii) depreciation costs of the platform on which the SWIFT communications network operates and of the RTGS system itself. The cost data are reviewed annually to adjust the rates established in the operating rules for the RTGS system, contained in Chapter III.H.1 of the *Compendium of Financial Regulations* (table 4).

Table 4

Fees

(Chilean pesos)

	1st.Half 2012	2nd.Half 2012	2013	2014	2015	2016	2017
Fixed monthly fee	935,000	1,200,000	1,270,000	1,270,000	1,302,000	1,418,000	1,610,000
Fee per FTI settled in the system	650	650	650	650	650	650	700
Fee per net clearing house settlement	650	650	650	650	650	650	700

Source: Central Bank de Chile.

The current rate structure breaks down into two components: a fixed monthly fee and a variable fee based on the number of operations settled in the system. All institutions that participate in the RTGS system pay the fixed monthly fee, regardless of their activity level, while only the sender pays the fee for a given fund transfer instruction settled in the system. The same fee is charged for the daily net settlements from clearing houses in which participants are members, regardless of whether their settlement account has been debited or credited in the net settlement. The fee structure does not include any kind of incentive to influence users' behavior, such as discounts for the volume of payments submitted, the value of a given payment, the time the payment is sent, or the mode of delivery, which is always through SWIFT messaging or the contingency mechanisms.

The activities related to the provision of real-time gross settlement services that are covered in the fee structure are the operation of the settlement accounts and the provision of fund transfer services. The fees do not include the provision of intraday credit to participants, and the access to the SOMA system, which manages the liquidity facility, is invoiced separately. There is no joining fee for new members and no annual fees, such as for the volume of services used, and there are no ad hoc fees for special services, such as the use of the platform for testing or training, the provision of bank statements, and so forth.

IV. Risk Management

Credit Risk Management

A payment system can be exposed to credit risk from participants or their payment and settlement processes. However, real-time gross settlement is designed to ensure that credit risk exposure is not generated between participants during the settlement process. Thus, SWIFT payment messages and Sinacofi contingency messages are exchanged between participants simultaneously with the transfer of funds, conditional on there being sufficient funds available in the sender's settlement account. The transfer is final and irrevocable, with no possibility of any retroactive action whatsoever in the event of default by one of the participants. No specific credit risk management measures—such as solvency-based access criteria, credit limits, or loss-sharing agreements—are implemented or considered necessary in the real-time gross settlement framework, where participants' accounts cannot be overdrawn.

From the participants' perspective, the fact that the Central Bank of Chile acts as the settlement bank reduces risk, because payments are settled through a debit to funds that a given participant holds at the Central Bank ("central bank money"), eliminating the credit risk faced by participants deriving from the settlement bank. This is not the case in systems where payments are settled using "commercial bank money."

The Bank can provide additional liquidity to participants in the RTGS system in the event that they have insufficient liquidity to settle their payments, through access to the intraday liquidity facility or the intraday liquidity facility with pledge. To manage the potential credit exposure to participants, the provision of liquidity is conditional on the transfer of eligible securities with an intraday repurchase agreement, using a delivery-versus-payment facility, or on the pledging of eligible collateral. In the latter case, the pledged securities are valued at a discount, and, at the time of the sale and transfer of the securities, the pledger is obligated to purchase and acquire, or release, the securities before the close of bank business day, subject to the applicable Bank guidelines, thereby eliminating the main risk for securities transactions. If a participant is unable to pay back the funds at the end of the day, the loan is transferred to the overnight liquidity facility and is charged interest. Transferring the exposures to the following day could possibly imply a small potential residual exposure for the Bank, in the event of very high volatility in the securities price. There are no loss-sharing rules on the allocation or distribution of possible losses among the other system participants.

According to the Central Bank Basic Constitutional Act, in order to facilitate the settlement in the RTGS system of net debit balances from the check clearing house in domestic currency, the Central Bank has the option of granting emergency liquidity loans to banks that do not have sufficient funds to pay their net debit balance from the clearing house (Section 36 N° 1 of the Act and Chapter. III.H. 1, on extraordinary settlement, of the *Compendium of Financial Regulations*).

Finally, to discourage the use of funds that are still in the queue, beneficiary participants are not given any information whatsoever on the status of incoming payments, either on aggregate or on a transaction-by-transaction basis. This is to prevent participants from making payments based on funds that they expect to receive but that are currently blocked in another participant's queue. Although this risk stems from a bilateral relationship, it could have a systemic impact if a payment order in the queue is rejected at the end of the day, leaving the beneficiary with a liquidity deficit. In practice, there have been very few such rejections in the RTGS system, and they have been practically insignificant in terms of value and volume.

Liquidity Risk Management

Given its nature and legal objective, the Central Bank of Chile does not face liquidity risk in domestic currency (Chilean pesos), in that it always has the liquidity to meet its liabilities in that currency. Consequently, for participants, liquidity risk arises not from the Bank, but rather from the possibility that their counterparties will not make the established payments.

The RTGS system uses a series of mechanisms and instruments to minimize the risk that scarce intraday liquidity will back up payments in participants' queues. These are designed to facilitate the flexible use of liquid resources and thus to increase the fluidity of payments over the course of the day. They include the following:

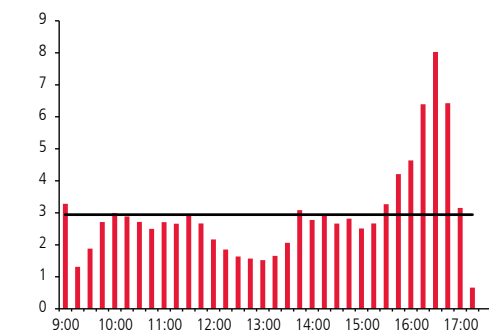
- (a) End-of-day balances are used to verify banks' compliance with their reserve requirements, so that participants can freely use the funds in their settlement accounts to settle obligations during the day. Moreover, reserve requirement compliance is based on averages in a given period. This means that a bank can use all of its reserves at any given time, as long as the final average is sufficient to meet the reserve requirement.
- (b) The Central Bank provides an intraday liquidity facility (ILF) and a pledged ILF, both of which are interest free, where the former is backed by repurchase agreements and the latter operates as a credit line subject to the pledge of collateral securities to the Bank. The eligible securities are valued at a discount depending on the type of asset offered by the participant. The Bank also provides a standing liquidity facility (SLF) in the event that a participant does not have sufficient funds, at the established time of day, to fulfill the ILF agreement. As mentioned, in this case the intraday loan is converted, either in full or in part, to an overnight loan using the same initial collateral that the participant is unable to repurchase, with an interest fee. A similar mechanism is used for the pledged ILF, wherein the fraction of securities signed over to the Bank that the participant is unable to release due to insufficient funds is transferred to a collateralized standing liquidity facility (pledged SLF).
- (c) A first-in-first-out (FIFO) queuing mechanism is used to facilitate the flow of transactions in the event that a payment cannot be settled due to a lack of funds and to allow participants to send payment messages continuously. At the same time, the FIFO mechanism allows the queue to be managed based not only on the order in which FTIs are received, but also on their priority.
- (d) Participants can continuously manage their liquidity by monitoring their RTGS account balance in real time. Senders can view their outgoing payment queues and can remove payments from the queue or move them up or down to change the order in which they are settled.
- (e) The RTGS system has an optimization mechanism for avoiding gridlocks and shortening queue times, thus reducing liquidity needs. This mechanism consists in a bilateral gross offsetting process (without netting), which operates automatically and periodically while respecting the order of payments in the queue.

- (f) The Central Bank settles its own operations during the business day by processing transactions that credit participants' account in the first hour of business and transactions that debit their accounts later, so as to facilitate liquidity management.
- (g) System operations are continuously monitored by the Bank staff to avoid the risk of draining liquidity from the system, as a result of one member being unable to send (but not unable to receive) payments. Fund transfers are executed using a contingency procedure that is not based on SWIFT messaging.

There are no regulatory guidelines on executing settlements at specific times of day or pricing incentives for early settlement in the RTGS system. In terms of value, approximately 75% of total payments sent by participants are settled by 3:45 p.m., with low rates of rejection after closing, as mentioned, and few extensions of operating hours, which are mainly due to hardware or software problems (figure 3). Notably, the time at which 75% of the total value of transactions is settled has been stable over time, with only occasional deviations. The greatest activity occurs after 4:00 p.m., following the close of the business day in the LVCH operated by ComBanc, which leaves the RTGS system as the only high-value payment system available for settling payment obligations between participants.

Figure 3

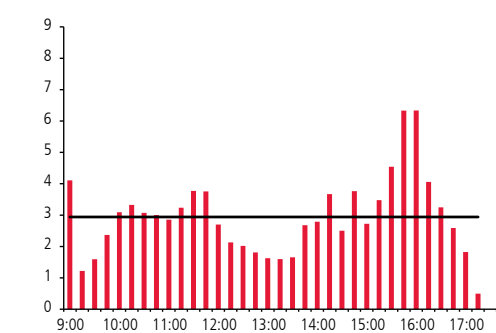
Intraday Pattern of FTI Settlements, by Volume (*)
(percent, every 15 minutes)



(*) Daily average in 2017.

Source: Central Bank of Chile.

Intraday Pattern of FTI Settlements, by Value (*)
(percent, every 15 minutes)



(*) Daily average in 2017.

Source: Central Bank of Chile.

Sources of liquidity in the RTGS system

A key aspect of the design of high-value payment systems is the balance between intraday liquidity and settlement risk. Real-time gross settlement systems generate a constant need for cash balances to cover payments in real time, while net settlement systems reduce the use of cash in relative terms but are vulnerable to default at the end of the business cycle. The CPMI defines intraday liquidity as “Funds which can be accessed during the business day, usually to enable financial institutions to make payments in real time.” The business day, in turn, is defined as the operating hours of the payment system, during which it is possible for a bank to receive and send payments—currently from 9:00 a.m. to 5:30 p.m.

The sources of intraday liquidity available to participants of the RTGS system are as follows: (i) balances held at the Central Bank; (ii) unencumbered assets on the member bank's balance sheet that can be freely transferred or pledged to the Bank and converted into funds in the respective participant's Central Bank account (“central bank

money”); (iii) payments received from other participants of the payment system, including operations carried out in the interbank money market; and (iv) payments received from external netting systems. These resources allow participants to cover their intraday liquidity needs for making own-account and client-account payments.

The empirical evidence indicates that on aggregate, there is now relatively ample liquidity in the payment settlement infrastructure (that is, liquidity sources exceed liquidity needs). This is reflected in the scarce lag between the moment a payment order is received and the moment it is effectively settled, which on average is just a matter of seconds. This could be explained by the relatively low opportunity cost of holding liquid funds, to the extent that the Central Bank accepts an adequate range of securities in exchange for liquidity in the RTGS system and the discount between the monetary policy interest rate and the return on the standing deposit facility is just 25 basis points.

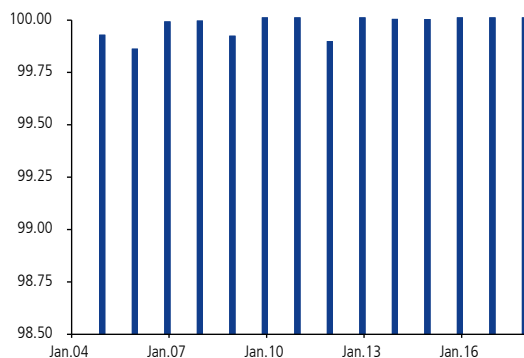
Operational Risk Management

Given the importance of the RTGS system for the financial system and the potential effects of a malfunction on other market infrastructures, the Central Bank has made it a priority to ensure the smooth operation of the system, focusing on high service availability and operational continuity. As a result, the RTGS system has achieved 99.97% technical availability since it opened in 2004, and there have been no interruptions since 2014 (figure 4). Technical availability, that is, the possibility that users can access fund transfer services, is measured throughout the business day, from 9:00 a.m. to 5:30 p.m., for all financial market business days, including any extended hours necessary to complete the day’s operations.

Figure 4

Availability of the RTGS system (*)

(percent)



(*) Annual average.

Source: Central Bank of Chile.

In this context, the Central Bank has a comprehensive risk management policy and regulatory requirements, described in the operational continuity plans and procedures. This policy includes the adoption of a Business Continuity Management System, administered by the Strategic and Operational Risk Administration Management (SORMA), which establishes, implements, operates, monitors, reviews, maintains, and improves business continuity; is part of the Bank’s general management system; and includes the organizational structure, policies, planning activities, responsibilities, procedures, processes, and resources necessary for implementation. This system operates within the institutional context related to the organization, functions, and responsibilities stipulated by the Board of the Central Bank, considering the preventive and reactive management of an incident or crisis. The goal of the Business Continuity Administration System is to identify the possible impacts of interruptions that threaten

the continuity of the payment system and to provide a framework for increasing the resilience of the financial system and its ability to respond effectively to such interruptions, while safeguarding the Central Bank's main stakeholders, reputation, and critical activities. Business impact analysis provides updated information on new vulnerabilities that could emerge and affect the RTGS system, which helps determine action plans for preventing their materialization. The Business Continuity Administration System received ISO 22301 certification on 25 November 2016, covering the high-value payment systems (LVPS) and including the following activities: (a) sending and receiving fund transfer instructions (FTIs); (b) settlement of fund transfer instructions; (c) settlement of OTC market transactions; (d) intraday liquidity facility operations; (e) settlement of multilateral netting systems; and (f) settlement of monetary policy operations.

The Central Bank of Chile's comprehensive risk management policy is based on the following international standards and practices: ISO 22301 Societal Security—Business Continuity Management Systems—Requirements; ISO/IEC 27001:2005; ISO/IEC 27002:2007; ISO 31000 Risk Administration—Principles and Guidelines; BS 31100 Risk Management; and the COSO Enterprise Risk Management Framework (of the Committee of Sponsoring Organizations of the Treadway Commission), which ensures consistency and effectiveness. Both the methodology that supports the practical application of the risk policy and the aforementioned standards are reviewed periodically to verify that they are up to date and to incorporate any new elements applicable to the Bank. In this line, the RTGS System Supervisory Committee advises the Financial Markets Division with regard to the strategic vision, acceptable risk levels for the Bank, policies, procedures, organization, systems, and situations that arise, contributing expert advice on the adequate management of the risks to which the Bank is exposed, in all things related to the RTGS system.

The main operational risks identified by the Central Bank of Chile are related to problems with the hardware, software, and communications network used by the RTGS system and the SOMA system, which handles the securities for the intraday liquidity facility. To manage these risks, operational continuity plans have been developed for different critical scenarios, aimed at reestablishing or delivering a certain level of service in response to connection, communication, and operational problems, which are tested regularly with the interested parties (semiannually with account holders and annually with third-party participants). This provides opportunities for a field assessment, to explore possibilities for closing the gaps observed in the business impact analysis (BIA), and at the same time allows people to develop the necessary skills for the correct application of the plans. The continuity procedures also include changing between the Central Bank's two processing sites and sending personnel outside the Bank to operate the RTGS system from the alternative operating site (AOS). The terms and conditions outlined in the aforementioned continuity plans may be subject to change to reflect the results of the tests carried out by the Bank or to incorporate operational, technological, and/or computational developments that could affect the RTGS system. In accordance with regulations, the operational continuity plans are specified in Chapter III.H.4 of the *Compendium of Financial Regulations*, in the operating rules for the RTGS system, and in the *Operational Continuity Procedures for Participants* in Circular Letter to Banks 598 and Law 20,345 N°5 on Management Corporations.

Testing continuity plans is essential for ensuring that the facilities, business processes, and decision-making mechanisms are robust. However, it is also necessary to ensure that the arrangements are compatible with system counterparties, including with regard to functional communications. Therefore, the Central Bank of Chile, in cooperation with system participants and financial regulators, has developed a coordination plan with the local financial sector that includes the implementation of market-wide business continuity exercises called "Industry Tests," with a focus on technological continuity (comprehensive stress tests and plans that cover IT) and business process continuity (developed using standard business continuity methodology, in which users face a technology crash due to scenarios such as natural disasters, unavailable facilities, loss of critical personnel, key suppliers, and malicious acts). Based on these tests, participants can then regularly formulate their own contingency plans and coordination capacity, identifying opportunities for improvement that help increase the resilience of the securities settlement and payment infrastructures.

In 2016 an RTGS System Users Committee was established as the main channel of communication with the industry, with representatives from all the participant banks. The Committee provides a formal mechanism for users to present their interests and concerns in relation to the RTGS system, covering issues such as restrictions on a more intensive use of the system, hours of operation, updating of contingency plans, projects being developed by the Central Bank, and so forth. The Committee representatives are the executives in charge of RTGS system operations in their respective entities, and they meet at least once a year in two or three sessions to allow the free exchange of ideas. The financial market infrastructures (FMI) also meet separately in an additional session. The RTGS System Users Committee analyzes and schedules the industry tests, with simultaneous participation by all system participants and/or FMIs under a protocol designed especially for this purpose by the Bank, which includes a description of the exercise, its purpose, the date and duration, the evaluation criteria, and the operating reports to be submitted by each participant. The Committee should serve as a means for announcing important changes before their implementation so as to gather opinions and for exploring relevant new issues in order to generate a collaborative work agenda.

Finally, cybersecurity is crucial for the operational continuity of the payment systems, as it can represent a potential source of financial shocks or a key channel for transmitting shocks between domestic and international financial markets, if there is a low level of cyber resilience. Consequently, the Central Bank has implemented security controls and response protocols for possible cyber attacks on the RTGS system. The effectiveness of these controls is continuously evaluated, with support from third-party assessments. In 2017, the Bank implemented tests aimed at raising awareness of cybersecurity risks among the entire staff, given their primary role in mitigating this risk. Finally, the Cybersecurity Committee was created in September 2017, comprising Bank senior management and reporting directly to the Board.

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Glossary^{18/}

Access: The right or ability of an institution to use the services of a payment system to settle payments on their own account or on behalf of their clients.

Automated teller machine (ATM): An electromechanical device that allows authorized users (using machine-readable plastic cards) to withdraw cash from their accounts and/or access other services such as balance enquiries, fund transfers, or deposits.

Bank for International Settlements (BIS): The Bank for International Settlements is an international organization that promotes cooperation among central banks and other agencies in the search for monetary and financial stability, acting as a bank for central banks. Established in 1930, the BIS is the oldest international financial organization. Given that its clients are central banks, the BIS cannot accept deposits or provide financial services to people or private entities.

Bank Identifier Code (BIC): An International Organization for Standardization (ISO) technical code that uniquely identifies a financial institution. SWIFT is the registration authority for BICs. A BIC consists of eight or eleven characters, comprising a financial institution code (four characters), a country code (two characters), a location code (two characters), and, optionally, a branch code (three characters).

Blocking: A bottleneck arising in a fund transfer system when some transfer instructions (due to insufficient funds) prevent the settlement of a substantial number of other transfer instructions from other participants.

Business continuity: Measures or agreements in a payment system to ensure uninterrupted service even if one or more of the system components fail or are affected by an abnormal external event. Includes preventive measures or agreements for facing contingencies.

Cámara de Compensación y Liquidación de Valores (CCLV): Subsidiary of the Santiago Stock Exchange, created by Law 20,345, which acts as a clearing house for the securities and fixed-income markets and as a central counterparty for the variable-income market, settling net balances in the RTGS system. Supervised by the Superintendence of Securities and Insurance.

Central bank money: Liabilities of a central bank, in the form of either banknotes or bank deposits held at the central bank, which can be used for settlement purposes.

Check: A written order from one party (the drawer) to another (the drawee) instructing the latter to pay, on demand, all or part of the specified sum as available in the drawer's checking account. Checks can be used to repay debts and withdraw funds from banks.

^{18/} This section is based on BIS (2003b, 2006, 2012a) and ECB (2009).

Clearing house: A central entity or centralized processing mechanism through which financial institutions agree to exchange transfer instructions for funds or other financial instruments (such as securities). The institutions settle the exchanged instruments at a given moment, based on the rules and procedures of the clearing house.

Clearing: The process of transmitting and reconciling payment or securities transfer instructions prior to settlement, including the netting of transactions and the establishment of final positions for settlement.

Closed user group: A security mechanism through which the Central Bank of Chile exclusively authorizes specific members to exchange transfer messages through the SWIFT network.

Collateral: An asset or third-party commitment that is used by a collateral provider to secure an obligation vis-à-vis a collateral taker.

Commercial bank money: Liabilities of a commercial bank, in the form of deposits held at the commercial bank, which can be used for settlement purposes.

Committee on Payment and Settlement Systems (CPSS): The CPSS is a standing committee of the Bank for International Settlements for establishing standards for payment, clearing, and settlement systems. It also provides a forum for central banks to monitor and analyze developments in local payment systems, clearing and settlement systems, and cross-border and cross-currency settlement schemes.

Credit exposure: The loss that a financial market infrastructure or its participants could incur in the event that one of the participants defaults on payment.

Default: A failure to complete a transfer of funds or securities on the due date, in accordance with the terms and rules of the system in question, for reasons that are neither technical nor temporary.

Deferred net settlement (DNS): A net settlement mechanism through which net balances are settled at the end of a predefined settlement cycle.

Delivery versus payment (DVP): A securities settlement mechanism that links a securities transfer and a fund transfer in such a way as to ensure that delivery occurs if, and only if, the corresponding payment occurs.

Depósito Central de Valores S.A. (DCV): Central securities depository established pursuant to Law 18,876, which is authorized to provide custody services for publicly issued securities and thus to facilitate securities transfers. In fulfilling this objective, the DCV electronically records and processes securities transfers executed in the securities exchange and the over-the-counter (OTC) market, coordinating and also providing the necessary information for the financial settlement.

Final settlement: Unconditional and irrevocable settlement.

Financial market infrastructure: A multilateral system among participating institutions, including the operator of the system, used for the purposes of clearing, settling, or recording payments, securities, derivatives or other financial transactions.

Fund transfer instruction (payment order): An order or message (in Chile, a SWIFT FIN message) requesting a transfer of funds (in the form of monetary rights drawn on one party) payable to the receiver's account.

Haircut: A risk control measure applied to assets whereby the assets are valued at their market value less a certain percentage (the haircut). Haircuts are applied by a collateral taker as protection against losses that could result from a decrease in the market value of a security in the event that the collateral has to be liquidated.

International Organization of Securities Commissions (IOSCO): An international organization of securities regulators, whose efforts are focused on promoting high regulatory standards so as to achieve solid, efficient, and fair markets, sharing experiences to foster the development of domestic markets, and joining efforts to establish uniform standards and an effective oversight of international securities transactions. Members are mostly securities commissions or the main financial regulator in each country.

Intraday credit: Credit extended and repaid within a single business day.

Intraday liquidity: Funds that are available or can be borrowed during the business day in order to enable financial institutions to effect payments in real time. Repayment of the funds borrowed should take place before the end of the business day.

High-value clearing house (HVCH): Electronic interbank deferred net settlement (DNS) system, with procedures for ensuring the final settlement of the net balance at the end of each settlement cycle, in the RTGS system. In Chile managed and operated by *ComBanc S.A.*, a banking services support corporation.

High-value payment system (HVPS): A funds transfer system through which High-value and/or high-priority funds transfers are made between participants in the system for their own account or on behalf of their customers. In Chile, the HVPS is made up of the RTGS system and the LVCH system.

High-value payment: A payment, generally for a very large amount, that is exchanged mainly between banks or between financial market participants and that usually requires urgent and timely settlement. Often used for large financial market operations, such as money market or foreign exchange market transactions, as well as for commercial activities.

Loss-sharing agreement: An agreement among participants in a clearing or settlement system regarding the allocation of any losses arising from the default of either a participant in the system or the system itself.

Multilateral net position: The summation of the value of all transfers that a participant has received from a net settlement system during a given period of time, less the value of transfers it has made to other participants. If the result is positive (negative), the participant is in a multilateral net credit (debit), position.

Netting: The offsetting of obligations between two or more participants via a mechanism for obtaining the net balance, thereby reducing the amount or value of the delivery or payment necessary to settle a set of operations.

OTC (over-the-counter): A method of trading that does not involve a regulated market. In OTC markets, participants trade directly with each other, typically through telephone or computer networks.

Participant: An entity that participates in a fund transfer system. This generic term refers to an institution identified by a transfer system (for example, by a bank identification number) that is authorized to send payment orders directly to the system.

Payment versus payment: A mechanism that ensures that the final transfer of a payment in one currency occurs if, and only if, the final transfer of a payment in another currency takes place.

Payment: The transfer of funds by the payer, using deposits held at the Central Bank or another financial institution, to a beneficiary, who accepts the payment as a mechanism for discharging a financial obligation.

Principal risk: The risk that a counterparty loses the total value of an operation, for example, the risk that the seller of a financial asset will irrevocably deliver an asset but not receive the corresponding payment, or that the buyer of a security will execute the payment but not receive delivery of the purchased security.

Queuing: A risk management arrangement through which fund transfer instructions are held pending by the system, until there are sufficient funds in the sender's settlement account to cover the transaction.

Real-time gross settlement: Settlement in real time of payments, transfer instructions, or other financial obligations on an individual (or transaction-by-transaction) basis.

Reserve requirement: The requirement for banks to maintain balances (bank reserves) at the Central Bank as a ratio of deposits and other demand and time liabilities (in Chile, vault cash can be included in reserves).

Retail payment system: A funds transfer system that typically processes a large volume of relatively low-value payments executed using a variety of means, such as checks, credit transfers, direct debits, and card payments.

Retail payment: All payments that do not fit the definition of High-value payments. Mainly consumer payments that are not time critical and are relatively low value.

Settlement agent: The entity that manages the settlement processes (for example, determining the settlement positions, controlling the exchange of payments, etc.) for transfer systems or other arrangements that require settlement.

Settlement bank: Either the central bank or a commercial bank used to effect fund settlements.

Settlement: The completion of fund and/or securities transfers, in the process of discharging obligations between two or more parties.

SWIFT (Society for Worldwide Interbank Financial Telecommunication): A cooperative created and owned by banks, which operates a network that facilitates the exchange of payment orders and other financial messages between financial institutions (including broker-dealers and securities firms) worldwide, using FIN messages. A SWIFT payment message is a fund transfer instruction. The subsequent exchange of funds (settlement) is executed in a payment system or through **correspondent banking relationships**.

Transaction reference number (TRN): A unique reference number used to identify an individual payment (for example, SWIFT payment messages).

Value date: The date on which a payment, transfer instruction, or other financial obligation is due and the corresponding funds must be made available to the receiving participant.

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CENTRAL BANK OF CHILE
May 2018

ISBN: 978-956-7421-40-4
Intellectual property registration N° 230.940

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