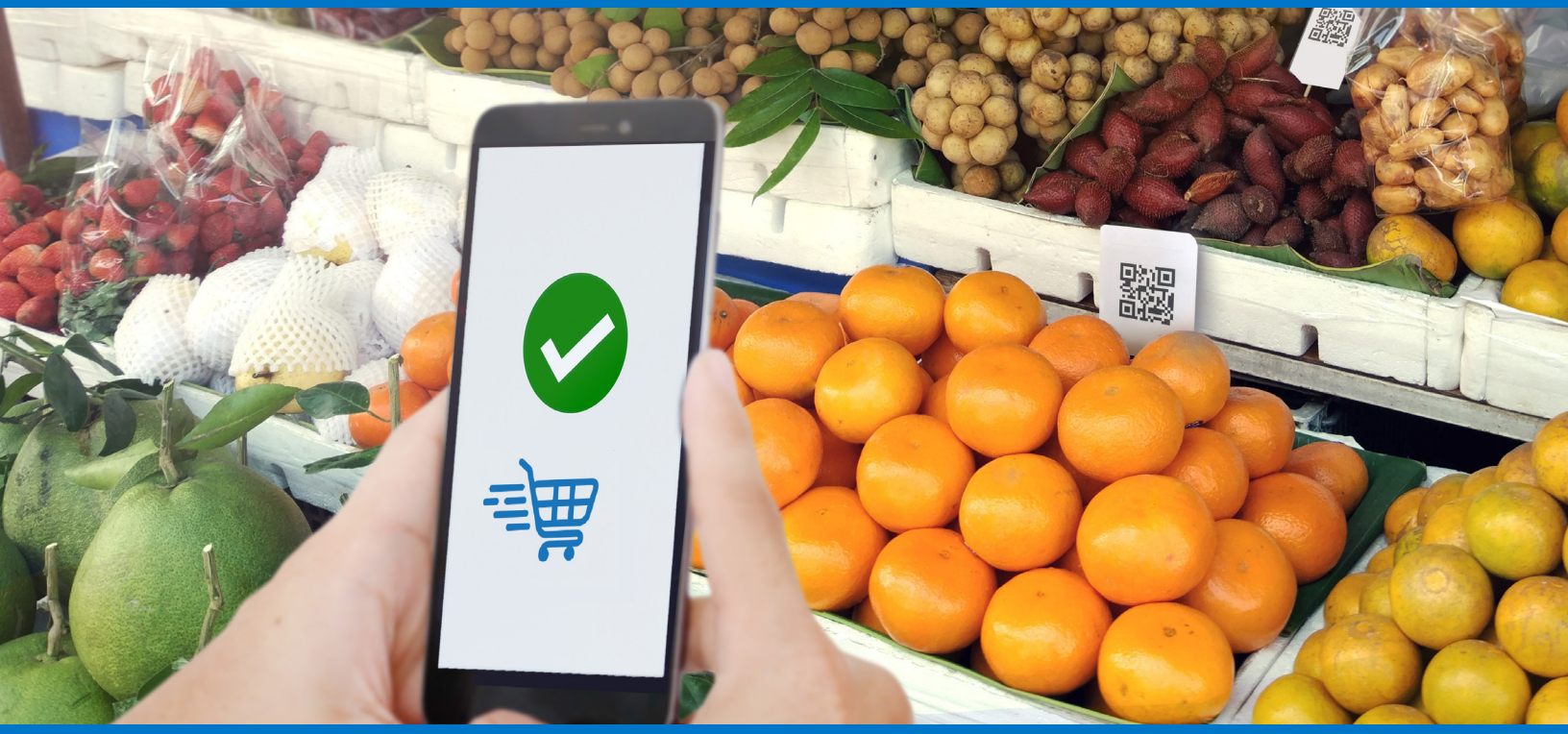
banco central Chile

# PAYMENT SYSTEMS REPORT

AUGUST 2024



# Payment Systems Report

AUGUST 2024

## Financial policy and objective of ensuring continuity of payments

One of the objectives set forth in the Constitutional Organic Law (LOC) of the Central Bank of Chile (BCCh) is "to ensure the normal functioning of internal and external payments". In order to comply with it, the BCCh regulates, permanently monitors and directly operates one of the payment systems, safeguarding its security and efficiency. These actions are part of the general framework of the BCCh's financial policy, which is aimed at promoting the stability of the overall financial system[1]/.

## Disclosure and transparency

The BCCh's Payment Systems Report allows communicating to the general public, on an annual basis, recent trends related to the use of means of payment, financial market infrastructures, and development and policy perspectives, including the BCCh's payment agenda[2]/.

## Initial considerations before reading this Report

A majority of central banks around the world have some mandate related to the payment system, as does the BCCh, because economic transactions require that the payments associated with them be carried out in a safe and efficient manner. For this purpose, modern financial systems require the operation of payment systems that allow the coordinated and uninterrupted operation of a wide range of means of payment, and a complex network of financial market infrastructures (FMIs).

For the BCCh, fulfilling this part of its mandate is becoming increasingly challenging due to the growing diversity and complexity of the means of payment, which is driven by ever-accelerating technological breakthroughs.

Banks and other financial institutions assume legal, credit and operational risks when providing large volumes and diversity of means of payment to their clients. To manage these risks, financial institutions participate in FMIs, which primarily provide rules and procedures, in addition to risk mitigation mechanisms (e.g., collateral and participation requirements, to name a few).

Large-Value Payment Systems (LVPS) are a particular FMI generally operated by central banks, as they allow making high value payment transfers, resulting from the aggregate processing of all payments in the economy. In Chile, the BCCh directly operates the Real Time Gross Settlement (named Sistema LBTR) system, which is a digital platform through which its participants transfer funds among themselves in local currency and in dollars.

A detailed review of key concepts explaining the operation of the Payment Systems and this Report is available to the public in a specialized section of the Bank's website[3]/.

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[1]/ See document Política Financiera del Banco Central de Chile (2020).

[2]/ Until 2020, part of the contents of this Report were included in our Financial Stability Report (IEF), Chapter VI in their second-half editions.

[3]/ See Key Concepts of the Payment Systems.

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## BOXES



*/ The statistical cutoff date for this Payment Systems Report was 31 March 2024.

# SUMMARY

*Since the publication of the previous Report, the use of digital means of payment (payment cards and electronic transfers) continues to grow in line with technological advances and greater availability for individuals and businesses. At the same time, two new financial market infrastructures began processing real-time payments and payments from the foreign exchange market, subject to a risk management framework convergent with international standards. In addition to these breakthroughs, that position the country near the levels of advanced economies, it is possible to identify aspects of improvement and public-private collaboration that would increase the safety, efficiency and access of people to retail digital payment services. To achieve these objectives, one essential determinant is the interoperability among payment systems.*

## MAIN DEVELOPMENTS IN PAYMENT SYSTEMS

**The use of digital means of payment is ever-increasing.** Both the number of transactions and the amounts processed via card payments and electronic funds transfers (TEFs) grew from the previous Report. More often than not, transactions with digital payment means are made with debit cards, although the greatest amounts involved correspond to payments made with TEFs.

**Various indicators of access to and use of digital means of payment show a degree of development of the retail payment system in Chile that is consistent with its economic advances and, in some dimensions, superior to it.** A large share of the population has access to digital means of payment, and card-acquiring networks are expanding, as is the use of TEFs. As a result, the number of digital transactions per person is comparable to that of some developed economies, although there is a gap with respect to the leading countries in the use of digital means of payment.

**Recent improvements to the regulations of the Central Bank of Chile (BCCh) incorporate new business models with adequate prudential standards.** These measures adapt the regulatory framework to the evolution of the industry, provide certainty and increase the robustness of the retail payment system. The Financial Market Commission (CMF) also published the regulation of the Open Finance System, which includes payment initiators, entities that can foster competition and contribute to financial inclusion.

**Maintaining the proper functioning and improving retail payment systems requires public and private efforts.** A possible expansion in the use of TEFs to pay the merchants would complement the supply of means of payment so that individuals and merchants can use the ones that best suit their needs, which poses challenges in terms of interoperability, and addressing them would require measures to be

taken by both the public and private sectors. Additionally, the high number of transactions unknown to users of digital payment methods is a risk factor that can have negative effects on the development of this system and financial inclusion, so any legal changes made to mitigate this situation must be effective.

## Financial market infrastructures

**For more than two decades, Chile has gradually implemented different financial market infrastructures (FMIs) that cover different markets, similar to those of advanced economies.** Payments derived from the processing of these markets, both listed in stock exchanges and over the counter, are ultimately settled through the Sistema LBTR, the RTGS operated by the BCCh. This system plays a central role in facilitating the settlement of all payments in the economy between financial institutions.

**During the first half of this year, two new clearing houses began operating, thus expanding the network of FMIs available in Chile in the field of payment systems.** In March and April 2024, respectively, a Retail Payments Clearing House (CPBV) specialized in TEF transactions and a Clearing House for Large-Value Payments in Foreign Currency for processing foreign exchange transactions (CCAV FX FX), specifically local peso-dollar spot transactions, began to operate. Both clearing houses settle their transactions in the Sistema LBTR.

**The start of operations of these two new FMIs is the outcome of regulatory and operational developments of the BCCh that have allowed channeling, within a scheme of appropriate safeguards and following international standards, private sector projects that will be relevant to improve and strengthen the functioning of the payments and financial market in Chile.** These breakthroughs are part of the BCCh's payments agenda which, in the area of infrastructure development and payment systems, considers continuing with the implementation of other Retail Payments Clearing Houses projects under way and the evaluation of a new phase of their regulation. Likewise, the processing of the peso-dollar spot exchange market will continue to be monitored, identifying gaps to be closed, as well as areas for improvement in order to continue promoting the adoption of the payment-versus-payment (PvP) standard, internationally recommended for this type of operations.

**As it announced in 2022, the BCCh will develop a second phase of the regulatory framework for CPBVs, while proceeding with the implementation of the current regulation.** In principle, the conditions and requirements are expected to be adapted according to the performance and behavior of each of the types of clearing houses in operation, both transversal and applicable to the processing of each means of payment. Likewise, there are plans to advance in requirements that promote adequate interoperability, both among the different CPBVs and in requirements or standards necessary for a simpler and more fluid entry of operations.

**The implementation of the Law that Strengthens the Resilience of the Financial System and its Infrastructures is expected to continue, which, among other measures, will allow the incorporation of non-bank participants to the Sistema LBTR.** The BCCh is working on regulatory developments to facilitate the connection of new non-bank institutions allowed by this Law to the Sistema LBTR, as well as on the provision of other services, including liquidity or deposit facilities, where applicable.

## Interoperability challenges in payment systems

**Increasing payment alternatives has the potential to benefit the economy by allowing individuals and businesses to carry out their daily transactions to acquire goods and services more efficiently, securely, and according to their own preferences.** In this sense, the process of transformation that the digital payments ecosystem has undergone through new technologies and different forms of organization has attracted the interest of several central banks.

**Interoperability is a fundamental attribute of payment systems, understood as the possibility for individuals and firms to use payment services, irrespective of the financial entities with which they keep an account.** Interoperability allows transactions to be performed seamlessly between different payment means providers, avoiding the need for users to participate in multiple systems. In this way, digital means of payment, such as payment cards or TEFs, can be used to pay at multiple merchants, whatever the banks or financial institutions of the parties involved.

**Higher degrees of payment system interoperability have benefits for the economy. A minimum level of interoperability is a necessary condition for the existence and development of a payment system.** The potential benefits of interoperability include boosting competition of payment services, fostering innovation, and contributing to financial inclusion by expanding the coverage, access, usability and availability of payment instruments.

**Considering comparative experiences and international developments, the main elements that define the interoperability capacity of digital means of payment are identified which, most recently, have been applied mainly to the dimension of direct payments or payments on account.** Based on this analysis, the main challenges to enhance interoperability and the development of TEF payments in Chile are identified, both for payments between individuals and from individuals to firms. In this area, development capabilities of the industry itself and alternative contributions in this direction from the authorities are visualized.

# I. MAIN DEVELOPMENTS IN PAYMENT SYSTEMS

*Digital payments, both through electronic and physical platforms for payment cards, and through systems based on Electronic Funds Transfers (TEFs), maintain the growing trend described in previous reports.*

*This steady progress has enabled the development of the retail payment system in Chile to rank above the average of countries with comparable economic development levels, especially in dimensions such as access to different digital payment methods and the use of TEFs.Still, a gap persists with respect to the leading countries in digital retail payments, and, therefore, opportunities for development are identified through additional efforts and initiatives by the industry and regulators to adapt regulatory frameworks in a timely and appropriate manner, favoring innovation while safeguarding security and efficiency.*

*In the case of card payments and equivalent systems, the BCCh recently incorporated new business modalities to its regulatory perimeter, including cross-border acquiring activities, while in June the Supreme Court settled long-standing controversies regarding some of the rules and operating conditions of this market.*

*In the case of TEF payment developments, Chile has a favorable starting point, which sets it apart from other countries in the region in attributes such as allowing immediate availability of resources, wide use among individuals, in addition to the participation of the entire banking system and, more recently, of non-bank issuers of prepaid cards. However, it is considered possible to achieve further progress, increasing its efficiency and use as a means of payment to retailers, which would boost the supply of payment methods for individuals and businesses, allow merchants to accept digital payments at lower cost and with an earlier settlement of funds, while at a general level, result in greater resilience of the payment system..*

*At the same time, opportunities are opening up with new payment modalities enabled through the Fintech Law, which establishes conditions for developing the so-called payment initiators, in the context of the implementation of the open finance system, whose regulatory framework was recently published by the Financial Market Commission (CMF). However, the increase in frauds or ignorance of payment transactions poses risks that can affect the various digital payment channels, although recent legal changes and some under implementation are seeking to reverse this situation.*

*Well-developed means of payment are essential for the proper functioning of the economy and for the efficient and safe execution of the multiple transactions and exchange of goods and services between individuals and firms. In this sense, a wide coverage of payment means or instruments is an essential attribute of a sound financial system, as they smooth the transfer of resources. The most basic way in which this can be done is through the physical handing over of cash. Alternatively, other means of payment such as cheques, payment cards or TEFs are used, which allow money transfers to be initiated.*

*28.Technological breakthroughs have led to a substantial increase in the use of non-cash means of payment, a trend that is frequently observed at a global level, although with varying degrees of intensity among jurisdictions. The development of e-wallets, QR codes and contactless payment methods, among other available technologies, expedite the payment process and encourage greater use of non-cash means of payment, which have benefits in terms of efficiency and security for individuals, financial inclusion and the formalization of the economy.*

*This chapter reviews the main recent developments in Chilean payment means.*

## EVOLUTION AND TRENDS IN PAYMENT MEANS[1]/

### *An overview of digital payment methods*

Digital means of payment on non-stop growing trend. In March 2024, 66% of household consumption was paid with a card (debit, credit or prepaid). This trend has been going on for years, and more recently there has been an emerging use of prepaid cards (Figure I.1). By construction of the indicator, the remaining 34% of household consumption is paid with means other than cards (cash, cheques or TEFs), and although disaggregated information is unavailable, it is reasonable to assume that the greater use of payment cards has as a counterpart a lower use of cash in the payment of household consumption[2]/.

**FIGURE I.1** HOUSEHOLD CONSUMPTION PAID WITH CARDS
(percentile, quarterly)

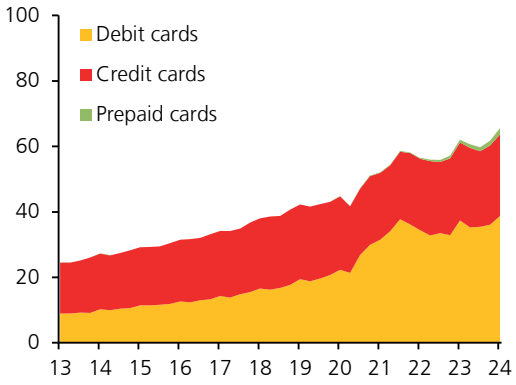
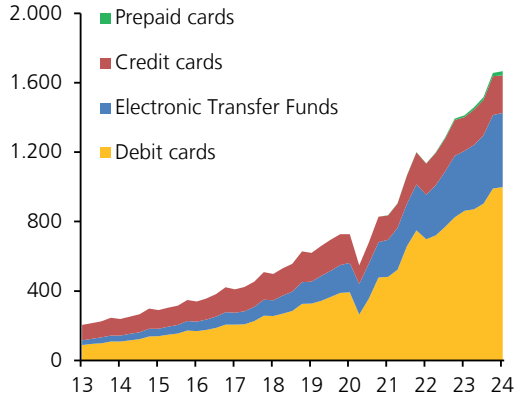



**FIGURE I.2** TRANSACTIONS MADE WITH DIGITAL PAYMENT MEANS
(millions, quarterly)




Note: Credit and debit card information contains data on firms and individuals. TEFs only consider only persons, and are both intrabank and interbank.

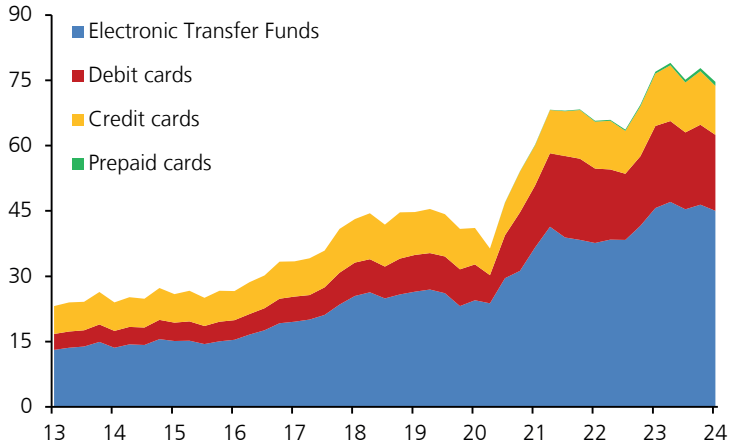
Source: Central Bank of Chile.

[1]/ According to the BIS (2022), retail payments are those made in the market of goods and services in which at least one of the parties to the transaction, the payer or the payee, is not a financial institution, thus differentiating them from payments made in the market of financial assets, known as high-value or wholesale payments.

[2]/ An in-house exercise with sales information from large retailers and disaggregated information provided by the main purchasers shows results consistent with the aforementioned trend.

**More transactions are made with digital payments every year.** When TEFs are also considered, transactions in 12 months increased from 5.29 billion in March 2023 to 6.3 billion in March 2024 (Figure I.2), which means that on average in Chile each person makes the equivalent of 315 digital payments per year.

**FIGURE I.3** AMOUNTS TRADED USING DIGITAL PAYMENT MEANS
(billions of dollars, quarterly)




Note: Credit amd debit card information contains data from firms and persons. TEFs consider only persons, and can be either intrabank or interbank.

Source: Central Bank of Chile based on data from the Financial Markets Commission (CMF).

**TABLE I.1** TRANSACTIONS AND AMOUNTS OF MAIN LOW VALUE PAYMENT MEANS

| Products | Number of transactions (millions) | | | var.24/23 | avg. var. | Amount (millions of dollars) | | | % GDP |
|---|---|---|---|---|---|---|---|---|---|
| | mar. 22 | mar. 23 | mar. 24 | %(*) | %(**) | mar. 22 | mar. 23 | mar. 24 | mar. 24 |
| Cheques - persons | 28 | 25 | 21 | -16 | -6 | 35.359 | 28.440 | 23.925 | 7 |
| TEFs and other online payments - persons (***) | 1.007 | 1.307 | 1.612 | 23 | 31 | 220.868 | 234.690 | 268.953 | 82 |
| Debit cards - persons | 2.585 | 3.149 | 3.568 | 13 | 28 | 70.090 | 65.611 | 68.295 | 21 |
| Banking credit cards - persons | 645 | 756 | 831 | 10 | 17 | 40.240 | 40.635 | 46.400 | 14 |
| Not banking credit cards | 23 | 27 | 27 | -3 | -13 | 1.558 | 1.558 | 1.455 | 0 |
| Prepaid cards - persons | 9 | 29 | 71 | 144 | - | 534 | 1.334 | 2.801 | 1 |
| ATMs withdrawals | 359 | 366 | 366 | 0 | -4 | 37.280 | 29.796 | 28.596 | 9 |
| **Totals** | **4.645** | **5.649** | **6.487** | **15** | **6** | **392.008** | **390.711** | **431.280** | **134** |

Note: Non-bank card information contains data on firms and persons. The data reflect the sum of the 12 months prior to March of each year. (*) 12-month variation, March 2024 with respect to March 2023. (**) average change is the average change in six years prior to 2024. (***) TEFs and other online payments consider transfers between individuals with different ID cards in the same and different banks, in addition to online payments.

Source: Central Bank of Chile based on CMF data.

**More transactions are made with debit cards, but the greatest amounts are for payments made with TEFs.** Sixty percent of digital payments are made with debit cards, but in terms of the amounts involved they represent just 23%. In turn, TEFs between individuals account for 26% of the number of transactions made, but the amounts involved account for 60% (Figure I.3 and Table I.1).

**The average amounts of digital payments are decreasing, reflecting a greater use of digital payments in smaller transactions (Table I.2).** Debit cards are the means of payment with the lowest average ticket, while TEFs on average are made for bigger amounts.

**TABLA I.2** MONTO PROMEDIO EN DÓLARES POR MEDIO DE PAGO DIGITAL

| Products | Average amounts (in dollars) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | mar. 16 | mar. 17 | mar. 18 | mar. 19 | mar. 20 | mar. 21 | mar. 22 | mar. 23 | mar. 24 |
| TEFs and other online payments-persons (*) | 576 | 557 | 523 | 341 | 252 | 222 | 219 | 180 | 167 |
| Debit cards - persons | 27 | 27 | 28 | 26 | 23 | 28 | 27 | 21 | 19 |
| Banking credit cards - persons | 70 | 67 | 69 | 64 | 53 | 62 | 62 | 54 | 56 |
| Not banking credit cards | 42 | 44 | 48 | 49 | 59 | 65 | 68 | 57 | 55 |
| Prepaid cards - persons | – | – | – | – | – | 78 | 57 | 46 | 40 |

Note: Non-bank card information contains data for firms and individuals. The data reflects the sum of the 12 months prior to March of each year. The average exchange rate for the respective month is considered.

(*) TEFs and other internet payments consider transfers between individuals of different IDs in the same and different banks, in addition to internet payments.

Source: BCCh based on CMF data.

**Regarding more qualitative aspects, card payment schemes are more developed than TEF payments in terms of affiliated merchants' network and interoperability dimensions.** Card payment schemes have traditionally relied on rules and coordination mechanisms between payment instrument providers and entities (acquirers) that manage merchant membership, which facilitates interoperability. On this basis, such schemes have been incorporating apps or other technologies that use QR codes, aliases, or mechanisms for contactless payment or payment with devices such as cell phones, which help users to make payments more expeditiously.

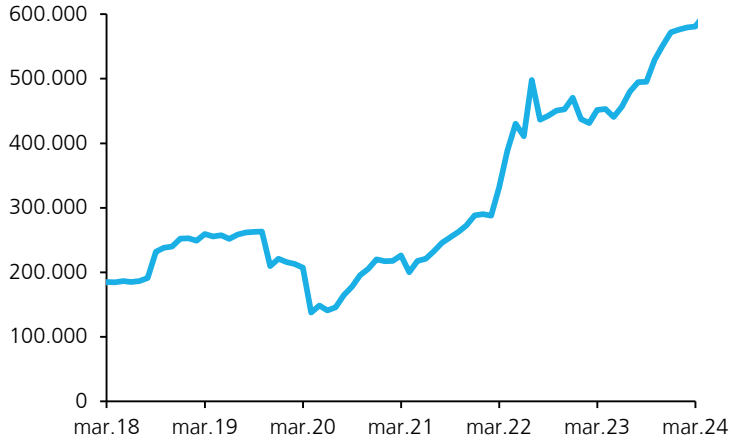
**For TEF payments, although there is coordination that allows transfers to be made between all banks and some non-bank entities, which has allowed a great development of person-to-person (P2P) payments by this means, there is still less development in its use for payments to merchants (P2B).** The TEF payment scheme in Chile presents important attributes such as immediate availability of funds, wide use among individuals, as well as the participation of the entire banking system and, more recently, of non-bank prepaid card providers. This constitutes a favorable starting point for further development of TEF payments or account-to-account payments, a topic of growing discussion worldwide and one in which central banks have promoted the development of rapid or instant payments. To move in this direction, the BCCh believes that recent advances in the implementation of its Retail Payments Clearing Houses regulation (Chapter II) can contribute to this. These advances,

together with the implementation of the Fintech Law on payment initiation services, and efforts underway in the industry, such as entities that provide services similar to those of card acquirers, should contribute to promoting greater interoperability and reach of TEF payment schemes (for a discussion on interoperability, see Chapter III).

### *Cards payments*

**The number of operational payment cards reached 27.5 million in March 2024, an increase of 5.4% over the same period the previous year[3]/.** At the same time, the number of commercial merchants that accept payment cards is increasing (Figure I.4). In March 2024, more than 580,000 merchants accepted cards, both face-to-face and remote, representing an increase of 28.7% over the same month the year before.

**FIGURE I.4** ESTIMATED MERCHANTS THAT ACCEPTED PAYMENT CARDS BY MONTH
(number of establishments)




Fuente: BCCh en base a datos de la CMF.

**There are currently more than eight million non-bank prepaid cards, but they account for only 1% of digital payments, in terms of both the number of transactions and the amounts involved.** As noted in the previous report, although there are several bank and non-bank issuers of this type of cards, factors such as their relatively new nature competing with products that are widely used --in some cases with a wider range of services-- and the problems of acceptance at the respective merchants mean that their use is still rather limited. The last of these factors may change in the future because a recent Supreme Court ruling, among other things, requires the application of the "honor all products" rule, whereby any merchant that accepts a credit or debit card of a given brand must also accept prepaid cards of the same brand.

[3]/ Considers credit, debit and prepaid cards, bank and non-bank, both personal and corporate.

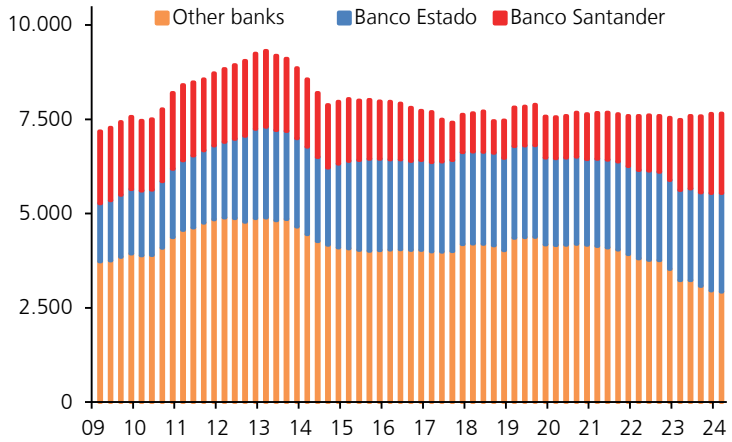
### *TEF payments*

**TEFs continue to be the main means of payment in terms of transacted amounts, although debit cards account for the largest number of transactions.** As of March 2024, TEF payments accumulated in the previous 12 months 1.61 billion transactions, for a total amount of CLP$268,953 million. This represents an increase of 23% over the previous year in the number of transactions, 69% of the total amount of digital payments, and 82% of GDP[4]/.

### *Use of ATMs*

**The number of automated teller machines (ATMs) has been relatively stable for several years (Figure I.5).** In 2013, there were approximately 9,500 ATMs in the country, but the figure fell to around 7,500 in recent years, which is partly explained by the higher costs of providing ATMs due to criminal acts, which led to increased security and minimum infrastructure requirements and higher requirements for the transfer of valuables. In addition, during this period, the two banks with the most ATMs increased their share from about 45% to 65% of the total number of ATMs. At the same time, the average amount of withdrawals made at ATMs is a decreasing trend, standing at around USD 70 in March of this year. It is worth noting that ATMs tend to be concentrated in districts with a lower poverty rate[5]/.

**FIGURE I.5** AUTOMATED TELLER MACHINES IN THE NATIONAL TERRITORYL
(number, quarterly)



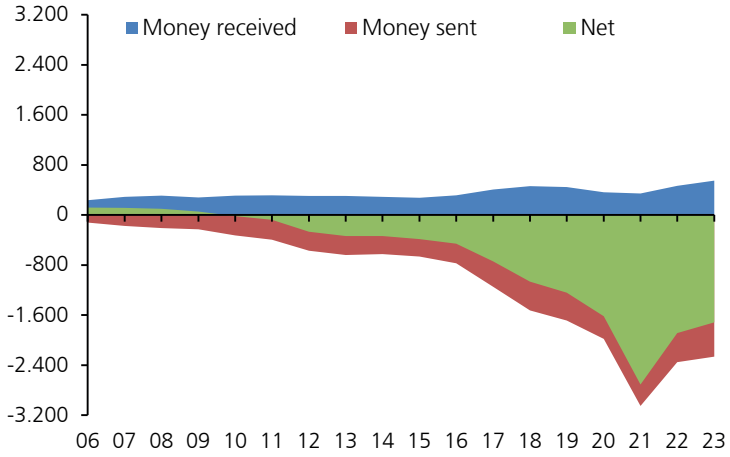

Source: BCCh based on CMF data.

### *Cross-border payments of personal remittances*

**Chile is a net originator of personal remittances; the main destination countries have varied.** With the rise in migrant flows, the transfer of money to and from abroad has become increasingly important, and since 2010 the flow of remittances has grown sharply. Thus, in 2023, remittances abroad amounted to USD 2.27 billion, while remittances from abroad were around USD 550 million (Figure I.6). The main destination countries are currently Colombia, Peru, Bolivia and Haiti, while the main countries of origin are the United States, Peru and Spain (Figure I.7).

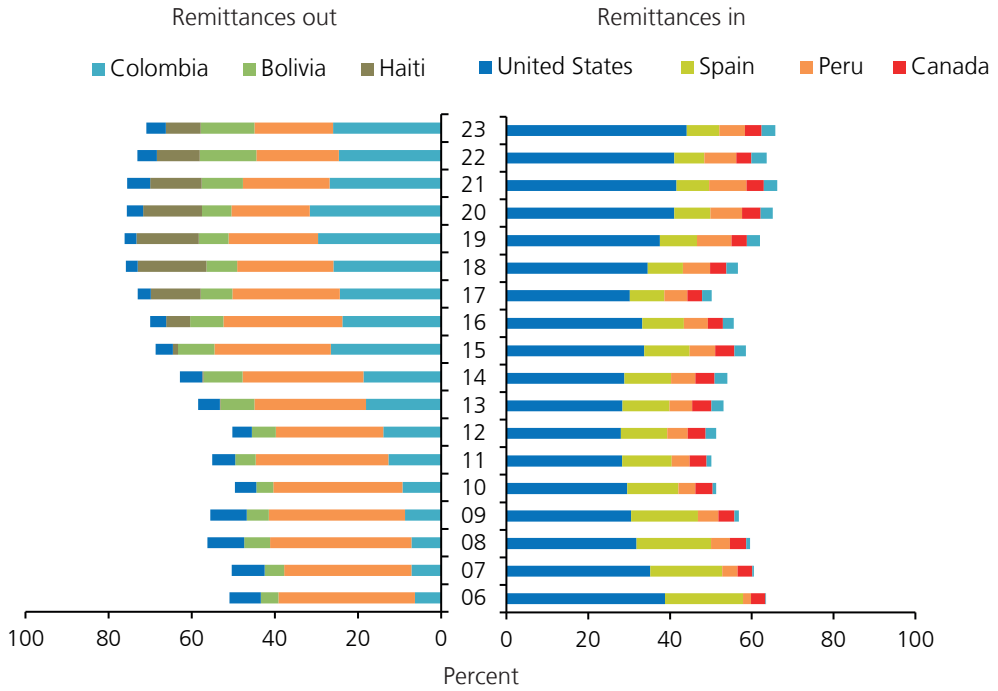
[4]/ Considers TEFs between natural persons, both intra and interbank.
[5]/ See Chapter I in ISiP 2022.

**FIGURE I.6** PERSONAL REMITTANCES FROM AND TO CHILE
(millions of dollars)




Source: Central Bank of Chile.

**FIGURE I.7** MAIN RECIPIENTS (A) AND ORIGINATORS (B) OF REMITTANCES, 2006-2023
(percent of total remittances, years)

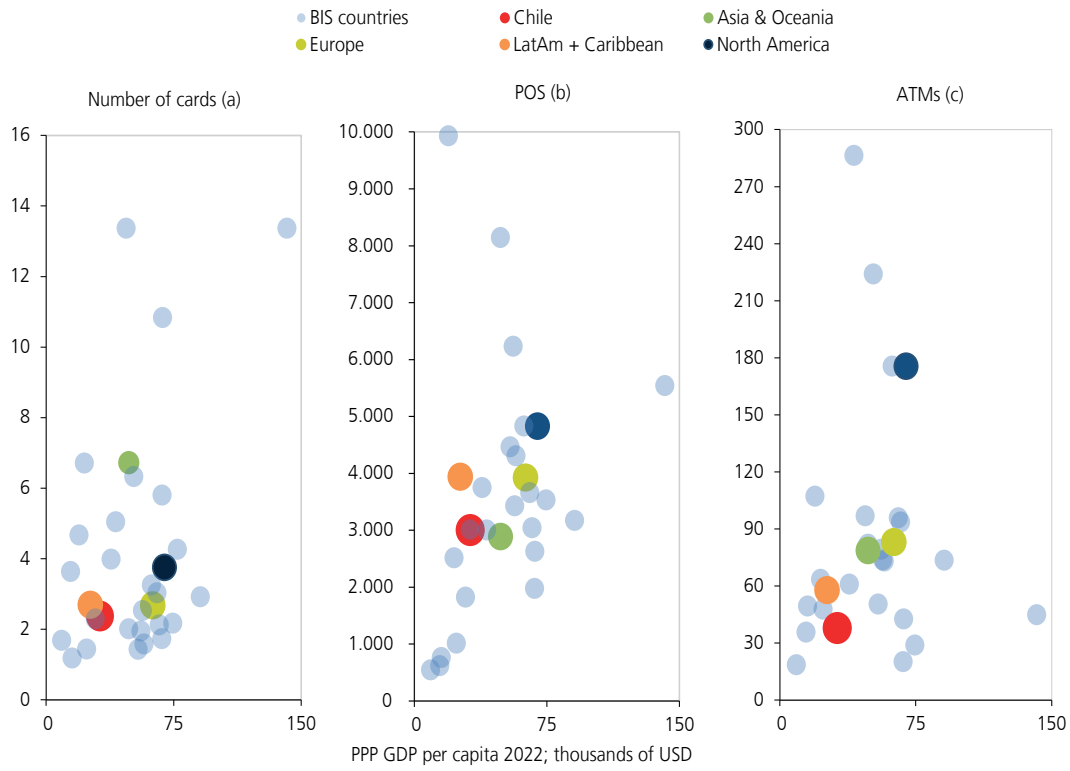



Note: The figure considers total percent of remittances sent, and total percent of remittances received..
Source: Central Bank of Chile.

## CROSS-COUNTRY COMPARISON[4]/

**Chile's retail payment system development level is consistent with its level of economic development, in terms of both access to and use of digital means of payment.** Chile has an average of two payment cards per person, which is relatively similar to the average in Latin America and Europe, but lower than in North America and Asia. At the same time, the number of points of sale (POSs) for face-to-face payments per 100,000 inhabitants is similar to the average in Asia, but lower than in other regions of the world, including Latin America, while the number of ATMs per inhabitant is at the bottom of a broad sample of countries (figures I.8.a, b and c).

**FIGURE I.8** PER CAPITA ACCESS TO CREDIT CARDS (A), POS (B) AND ATMS (C) PER 100,000 INHABITANTS, 2022

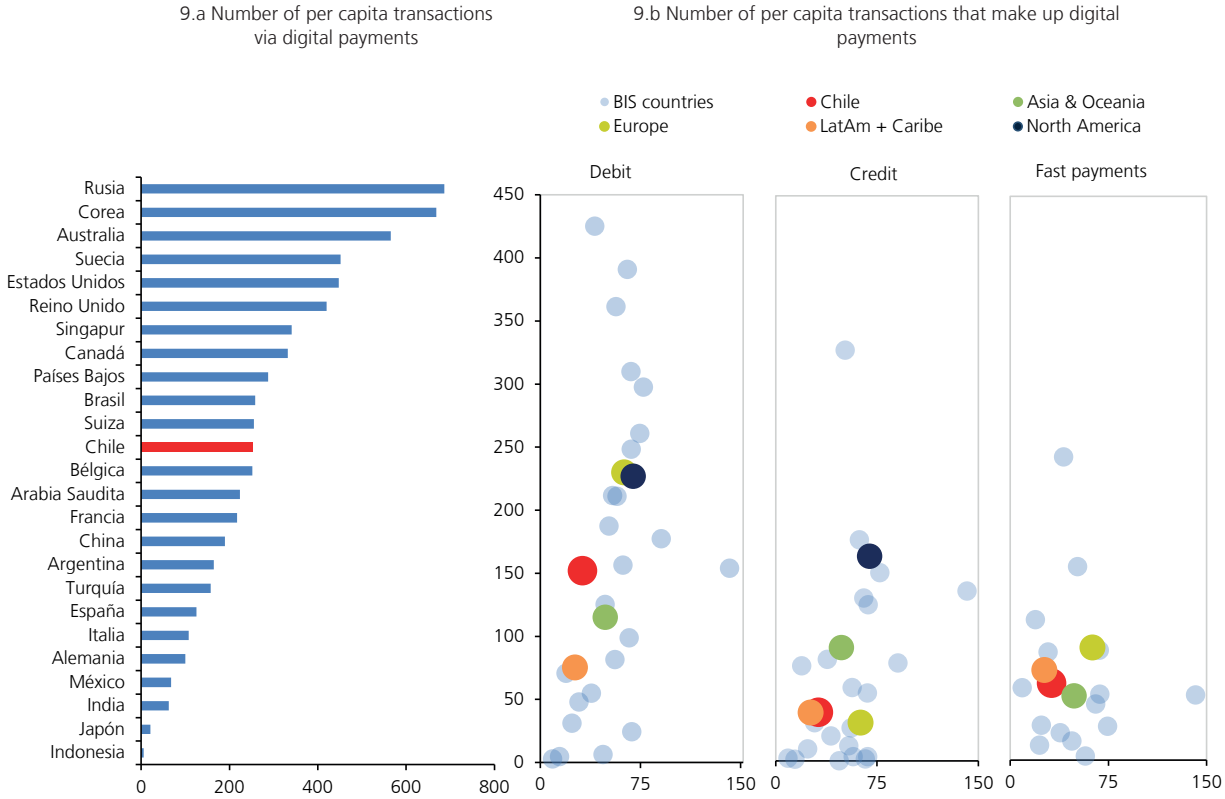



Note: Current GDP per capita in purchasing power parity (PPP). BIS countries refers to the sample of countries reporting to the BIS.
Source: BCCh based on BIS and CMF data.

[4]/ This analysis uses information submitted to the BIS by different countries, classified into the following geographical areas: Asia and Oceania includes Australia, China, Hong Kong, India, Indonesia, Japan, Korea, Saudi Arabia, Singapore, Turkey and Saudi Arabia; Europe includes Belgium, France, Germany, Italy, Russia, Spain, Sweden, Switzerland and the United Kingdom; Latin America and the Caribbean includes Argentina, Brazil, Chile and Mexico; and North America includes Canada and the United States. GDP in current dollars PPP ( purchasing power parity) is used, and per capita indicators are calculated over the total population.

**Access to digital means of payment, the expansion of acquiring networks and the use of TEFs combined led to slightly more than 250 digital payment transactions per person in Chile in 2022, which is around the median of the countries reporting to the BIS (Figure I.9.a).** When this information is disaggregated by means of payment, it can be seen that Chile has more debit card transactions per person than countries with relatively similar per capita income levels, and higher than the average number of cards in Asian and Latin American countries. The same is true for TEF payments, where Chile has a prominent position, although some countries with similar income levels have more of these transactions. Finally, more credit card payments are made per person than in Latin America and Europe, but less than in Asia, Oceania and North America (Figure I.9.b).

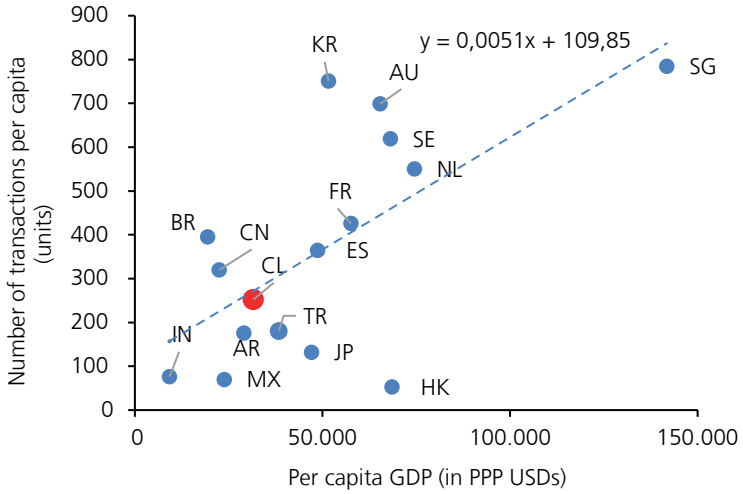
**FIGURE I.9** NUMBER OF PER CAPITA TRANSACTIONS IN DIGITAL PAYMENTS VIA SELECTED INSTRUMENTS, 2022




Note: North America does not report instant payment data for 2022; in the case of Russia, 2021 and 2022 are estimated using growth rate of previous periods. BIS countries is the sample of countries reporting to the BIS.

**By considering a more extended time span, it is observed that in the different geographic areas there is relative stability in the number of payment cards per person.** Asia and Oceania is the geographical area where, in recent years, payment card ownership has been highest, with six cards per person, while in Europe and Latin America, including Chile, the number is closer to two (Figure I.11.b).

**FIGURE I.10** TRANSACTIONS WITH DIGITAL PAYMENTS, 2022

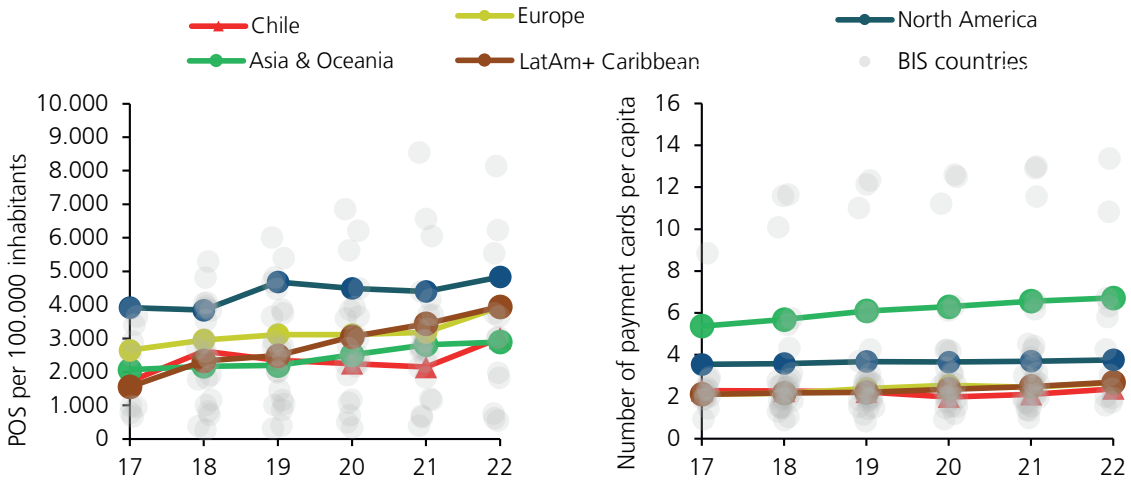



Note: AR=Argentina, AU=Australia, BR=Brazil, CN=China, CL=Chile, ES=Spain, FR=France, IN=India, SE=Sweden, KR=Korea, JP=Japan, MX=Mexico, TR=Turkey, NL=Netherlands, HK=Hong Kong, SG=Singapore. The GDP used is in PPP dollars. Digital payments are the sum of payments made with debit cards, credit cards, and TEFs.

Source: BCCh based on BIS and CMF data.

**The number of points of sale (POS) per person tends to increase in the various geographic zones, but a higher number of cards is not necessarily associated with more POS.** Although Asia and Oceania have, on average, greater availability of cards per person, it is the geographic area with the lowest number of POS. At the same time, the number of POS per person in Chile is similar to that of Asia and Oceania, but lower than that of the other geographical areas, including those with similar payment card availability (figures I.11.a and I.11.b).

**FIGURE I.11** EVOLUTION OF ACCESS TO POS (A) AND PAYMENT CARDS (B)



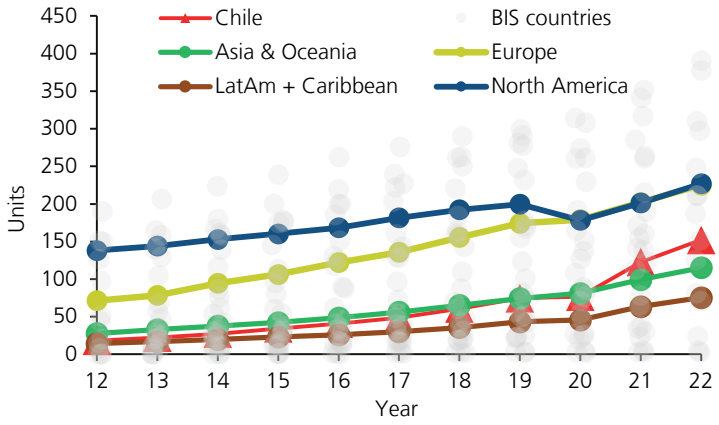

Note: BIS countries is the sample of countries reporting to the BIS.

Source: BCCh based on BIS and CMF data.

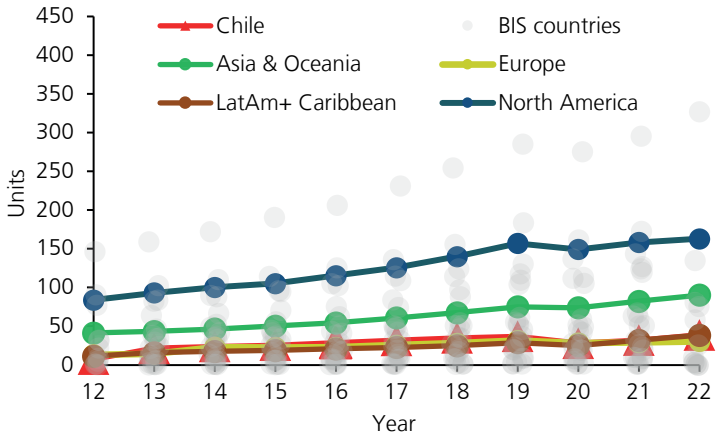
**The evolution of the number of transactions with digital media per person in Chile tends to resemble that of the rest of the world. In general terms, in most geographic areas there is a relatively sustained growth in the number of digitally paid transactions.** In this context, there are some changes that may be related to the Covid-19 pandemic, such as a decrease in debit card transactions in North America during 2020, and a subsequent acceleration in the number of debit card payments in several countries, including Chile. However, greater changes are observed in transactions made with instant payment systems through account-to-account or TEF payments, which are growing especially in Europe and Latin America, the latter strongly influenced by the operation of the Pix system in Brazil (figures I.12.a, b and c).

**FIGURE I.12** EVOLUTION OF NUMBER OF PER CAPITA TRANSACTIONS WITH DIGITAL MEANS OF PAYMENT

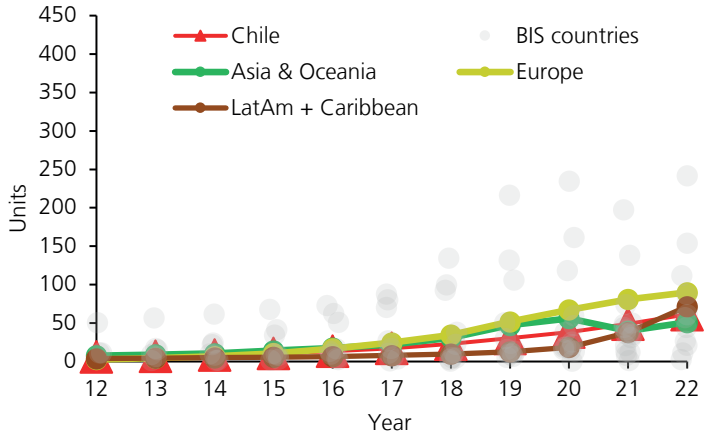
12.a Debit cards




12.b Credit cards



12.c Instant payments




Note: North America does not report instant payment data for 2022. BIS countries is the sample of countries reporting to the BIS.

Source: BCCh based on BIS and CMF data.

## POLICY DEVELOPMENTS

**Digital payments have several benefits in terms of safety, cost, and efficiency for their users.** Access to digital payments can contribute to the regularization of the economy and financial inclusion, because having a transactional account in which individuals and businesses can receive, store and manage money connects them to the financial system. It can also facilitate access to other types of financial products and services, considering the informational value of the data generated by digital transactions. Moreover, the availability of digital payments also has positive effects in terms of the resilience of the payment system, as several studies show that it has an impact on the economic performance of countries (Pesme (2023); Aguilar et al (2024)).

**As noted in the previous section, Chile's development in this area is consistent with its level of economic development, notwithstanding the fact that improving the system would require actions and initiatives by the system and regulators.** Considering that there is high availability of means of payment in the country, enhancing their use would require that card acquiring networks continue to expand, and facilitating the use of TEFs as a means of payment, particularly for transactions between individuals and merchants. The latter requires, as a first step, simplifying the way in which TEFs are initiated from the users' perspective, maintaining adequate levels of security and fraud prevention, and ensuring interoperability among the different account providers. This aspect is analyzed in greater detail in Chapter III.

**However, progress in the use of digital payments may be challenged by the high numbers of transactions unknown to users, particularly ATM withdrawals.** In the second half of 2023, 0.12% of transactions with digital means of payment were not recognized by users under Law No. 20,009, amounting to around USD 193 million. As a reference, in the European Union fraud levels in recent years have been around 0.02%. Further details of the composition of unknown transactions are presented in Box I.1.

**The legal framework on fraud in means of payment obliges issuers to absorb losses associated with transactions unrecognized by users in most cases, although legal adjustments have recently been made aimed at improving it.** Prior to the legal amendment of 2020, there were no clear rules regarding a number of common aspects observed in comparative legislation, particularly in the delimitation of the financial client's responsibilities, as well as the deadlines for the restitution of funds[7]/. However, three years after the implementation of the reform, in which abnormal growth in certain types of fraud was observed, it became necessary to introduce improvements in safety and moral hazard mitigation.

**Among the amendments to Law No. 20,009, enacted in May 2024, the CMF was empowered to regulate operational standards.** So that, it is allowed, through regulations, to modify the threshold of 35 UF below which issuers must pay the resources claimed within 10 days (formerly 5 days); a catalog of presumptions of self-fraud was defined; and it was established to require a sworn affidavit when reporting a fraud. Most of these adjustments are expected to take up to one year to be implemented, so their effects will not be fully perceived until then. The most recent information shows a significant decrease in the number of unrecognized transactions, although this must be monitored over time, since keeping fraud low is essential for developing the payment system and financial inclusion.

**The Chilean Supreme Court recently ruled on various contractual aspects of the payment card market, which provides certainty in important aspects for its operation[8]/.** Thus, in practice, some aspects that until now were part of the rules of card-branding schemes are now regulated, especially those related to the interaction between acquirers and sub-acquirers. In addition, restrictions on cross-border acquiring must be eliminated, brand costs and interchange fees must be made transparent, and the "no surcharge rule" must be applied[9]/) to card payments, as well as the acceptance of all classes of cards of the same brand for a merchant that already accepts some of them (the "honor all products" rule). Finally, a regulatory recommendation is made to the Executive to take measures such as regulating branding costs and incorporating payment service providers (PSP) more broadly to the supervision of the CMF and the Financial Analysis Unit, matters that would require a legal amendment.

**The BCCh updated its payment card regulation last July, adapting it to the evolution of the industry.** After a public consultation process, the Bank decided to make modifications to this regulatory framework. Among the adjustments made, it was established that PSPs that settle payments to affiliated merchants will enter the regulatory perimeter and the supervision of the CMF at an earlier stage, which will provide them with a series of safeguards to ensure the continuity of the payment chain to merchants. This should help to further expand the network of merchants that accept being paid by digital means. Meanwhile, a regulatory framework was incorporated for the cross-border acquiring service, which allows people to pay with their payment cards issued in Chile at affiliated merchants abroad, such as streaming platforms, for example.

**The regulation also includes new business models with prepaid cards that allow payments between customers of the same issuer, as seen in other countries.** These adjustments are in line with the aforementioned Supreme Court decision, provide certainty and increase the robustness of the retail payment system. However, the uncertainty regarding the compatibility of the fees charged to merchants

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[7]/ In comparative regulation it is common to observe the existence of deadlines for the refund or reversal of transactions, ranging from one day (in Europe) to 10 days (in the U.S.); limits on the amount to be borne by customers (no limit or no more than 50 euro); and the responsibilities of financial institutions with respect to the implementation of security measures (e.g., double factor authentication).

[8]/ The ruling relates to claims filed by various entities with respect to General Instruction No. 5 issued by the Court for the Defense of Free Competition (TDLC in Spanish) in August 2022.

[9]/ Merchants pay a fee each time they make a card sale. Under this rule of the international card brands, the selling price of goods and services should not be higher when payment is made with a card instead of cash.

by the largest acquirer with a previous Supreme Court decision has yet to be resolved; and more recently, a new controversy has been raised in court, regarding the activities that acquirers may or may not perform.

**The CMF published in July the rules governing the Open Finance System (SFA in Spanish), including providers of payment initiation services.** These entities, upon client consent, instruct debits and credits to accounts managed by financial institutions, and have the potential to contribute to increasing levels of competition and financial inclusion. The implementation of the SFA will be gradual and the recently published rules will come into force in 24 months. In the case of payment initiators, an additional period of 18 months is envisaged for the full entry into force of their regulatory framework. The BCCh is currently evaluating the regulatory framework for those payment initiators whose operating model includes payment commitments to member merchant networks.

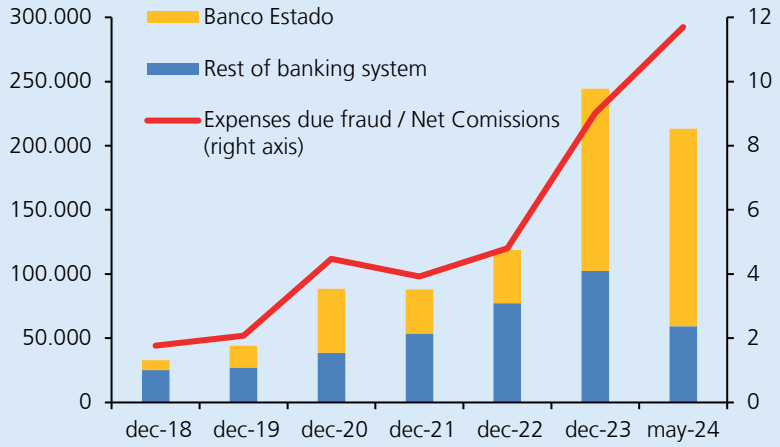
BOX I.1:

## Fraud and unauthorized transactions in the use of digital payment methods in Chile

**In recent years, there has been a significant increase in fraud and unauthorized transactions reported by users of payment methods, leading to higher system-wide costs and losses for payment service providers.** However, it is expected that the recent amendment to Law No. 20,009 will reverse the trend, considering that it incorporates several fraud-mitigating measures recommended during the legislative discussion[10]/.

**Although in absolute terms an increase in the amounts defrauded was to be expected as the use of electronic payment methods becomes more widespread, the sharp rise in the levels of unauthorized transactions in Chile are quite different from those observed in other countries.** Even though the objective of the 2020 amendment to Law No. 20,009 —which "limits the liability of holders or users of payment cards and electronic transactions in the event of loss, theft or fraud"— was to balance the relationship between cardholders and issuers of means of payment, in the face of the costs of eventual unauthorized transactions, one can see that the losses due to fraud with digital payment methods in Chile grew sharply since their implementation. Based on the available information, since 2021 there has been a significant increase in operational risk losses (35% in 2022 and 106% in 2023, compared to the previous year) experienced by banks —and especially BancoEstado— as a result of external fraud, including those related to Law No. 20,009 (Figure I.13[11,12]/.

**FIGURE I.13** EXPENDITURE DUE TO EXTERNAL FRAUD IN THE BANKING SYSTEM
(millions of pesos, percent)




Note: Net commissions are defined as the financial income corresponding to remunerations generated by services provided (including card services and account administration), minus expenses for commissions of the same nature, reported monthly to the CMF

Source: BCCh based on CMF information.

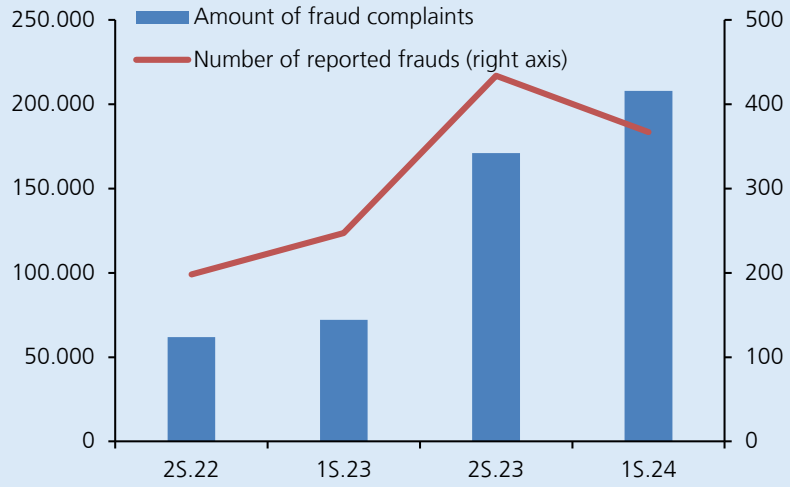
[10]/ Law No. 21.673

[11]/ Information requested monthly by the CMF, defined in the Compendium of Accounting Standards for banks as losses derived from any type of action aimed at committing fraud, appropriating assets or violating the law by third parties (unrelated to the bank), for example, computer crimes and robberies at branch offices.

[12]/ This analysis only considers the situation of banks because more accounting and administrative information is available, but the legal and regulatory framework on fraud is the same for non-bank card issuers and savings and loan cooperatives.

**This result is consistent with the sustained increase in complaints of fraud and unauthorized transactions following the above-mentioned legal modification.** By way of reference, the number of complaints during the second half of 2023 increased by 119% compared to the same period the previous year, and the amounts involved reached approximately USD 276 million during the same year (Figure I.14)[13]/.

**FIGURE I.14** UNAUTHORIZED TRANSACTIONS OR FRAUD COMPLAINTS
(millions of pesos, thousands)




Source: BCCh based on half-yearly information published by the banks.

**At the international level, it can be seen that, although in absolute terms card fraud is increasing, at the transaction level it remains relatively constant at around 6.8 cents for every USD 100 in 2020, and is even projected to decrease[14]/.** In the specific case of the European Union, the total amount of card fraud has decreased in recent years, reaching 0.028% of the total amount of transactions —in person, remote and at ATMs— and 0.021% of the total number of transactions. for the year 2021[15]/.

**In Chile these figures are higher. Measured in absolute terms —in the second half of 2023— fraud per transaction amounts to 11.8 US cents per 100 US dollars, in the case of complaints of unauthorized card transactions[16]/.** On the other hand, at an aggregate level, in the same period unauthorized transactions reached 0.12% of the amount transacted and 0.0134% of the total transactions. However, the distribution of cases of fraud in Chile, according to the type of payment method and issuer, is heterogeneous. For example, the main source of fraud —in terms of amounts involved— is ATM withdrawals using cards issued by Banco Estado (77% of its complaints in the second half of 2023), which is different from what is observed in other jurisdictions. Likewise, in the case of the European Union, ATM-

[13]/ Based on monthly supplementary financial information on external fraud published by the CMF. This amount may include not only fraud related to Law No. 20,009, but also that of other computer crimes and robberies at branch offices.

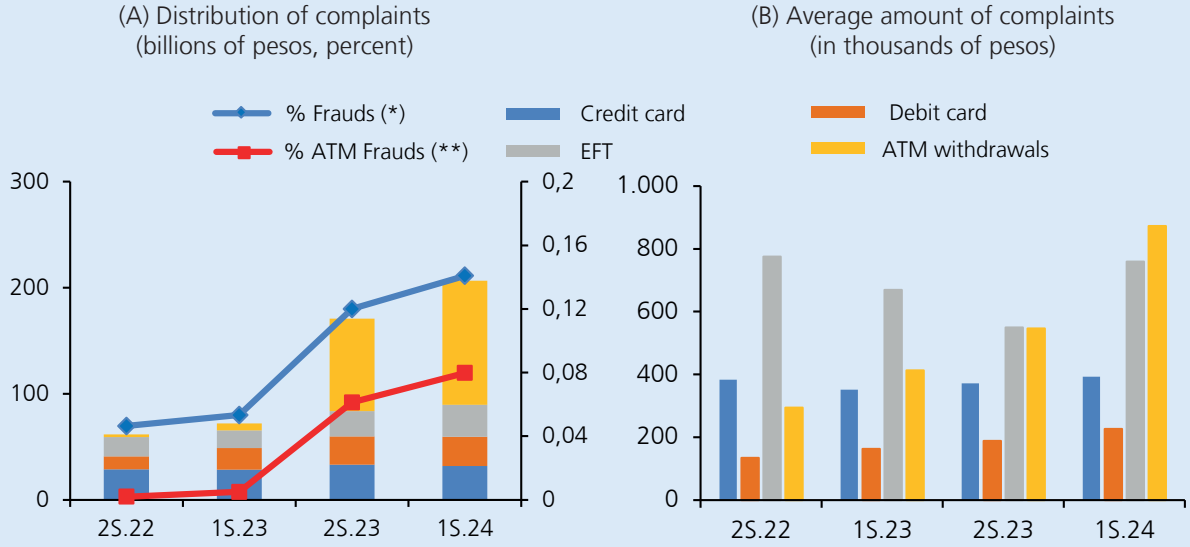
[14]/ Source: Nilson Report: https://nilsonreport.com/newsletters/1254/

[15]/ Source: European Central Bank: Card fraud in Europe declines significantly (europa.eu)

[16]/ These figures are extrapolated from reports of fraud associated with the use of different electronic payment methods: credit, debit and prepaid cards, electronic funds transfers and ATM withdrawals, published by financial institutions, as stipulated in article 11 of Law No. 20,009.

related fraud accounted for around 5% of the amounts defrauded and only 1% of total fraud, while in Chile the figures were 51% and 37%, respectively.

**FIGURE I.15** DISTRIBUTION AND AVERAGE AMOUNT OF UNAUTHORIZED TRANSACTIONS BY TYPE OF TRANSACTION




Note: Frauds (%) (*) is the total number of complaints of fraudulent or unauthorized transactions as a percentage of the total amount of transactions. ATM Frauds (%) (**) is the number of complaints of fraud or unauthorized transactions at ATMs as a percentage of the total amount of transactions. TEF is electronic funds transfer.

Source: BCCh based on half-yearly information published by the banks.

**There is also heterogeneity in the amount of losses per number of accounts.** Although it is to be expected that the more accounts a bank has, the greater its losses will be in absolute terms, when calculating the losses per number of accounts for each bank, significant differences can be seen. Thus, considering the number of unauthorized transactions reported by the banks for the second half of 2023, the total losses vary between C$2,352 and C$6,247 per account. Something similar happens with reports of unauthorized TEFs, where the losses are between C$299 and C$2,633 per account. Finally, under the same parameter of losses per account, the cost of unauthorized transactions linked to debit cards ranges between C$329 and C$1,117; and that of credit cards between C$133 and C$3,705.

**In terms of the impact on the financial situation of the banking sector, gross external fraud reached its highest historical value at the end of 2023.** Considering the financial statements for December 2023, gross external fraud is equivalent to 6.1 basis points (bp) of total assets (103% more than in 2022) and 76.7 bp of equity (82% more than in 2022). Regarding the financial results, this figure represents 5.4% of the year's profits (2.2% in 2022), and 9% of the net commissions earned by the banking sector, almost doubling the figure for 2022. All these indicators, including the total gross amount, suggest that external fraud doubled in 2023 compared to the previous year, with Banco Estado being the one with the greatest impact. Furthermore, given that losses from external fraud are part of the calculation made by

the CMF for the requirements of operational risk-weighted assets for the banking sector, if these levels of loss are maintained over time, they could have an impact on capital requirements for the banking sector.

**The latest changes to Law No. 20,009 seek to strengthen fraud risk prevention mechanisms.** More exhaustive reporting procedures are introduced (sworn affidavit and reports to the authorities); reduction of deadlines for disallowing transactions (from 120 to 60 days); possibility of establishing by means of a regulation lower and differentiated thresholds by type of payment method, for the immediate refund of disputed transactions, in the absence of fraud or gross negligence on the part of the user; mandate for the CMF to issue instructions on minimum standards of security, registration and authentication; a new system of presumptions for cases of fraud or gross negligence, among others. In this sense, there has already been a decline in losses from external fraud reported to the CMF since April 2024, from C$74 billion in March to C$35 billion and C$18 billion in April and May, respectively, as well as in the number of complaints in the last six months (Figure I.14). This must be monitored exhaustively over the coming months, for the benefit of more efficient development of the payment system and greater financial inclusion, and the way in which the regulatory implementation of the new legal standards can contribute to these objectives.

# II. FINANCIAL MARKET INFRASTRUCTURES

*Across two decades, Chile has gradually implemented a variety of financial market infrastructures (FMIs) covering different markets, both stock exchanges and over the counter (OTC), in a manner similar to advanced economies. Among these FMIs, the RTGS system operated by the Central Bank of Chile (BCCh) (Sistema LBTR) plays a key role in facilitating the settlement of all payments in the economy between financial institutions.*

*This year, two new clearing houses were incorporated, thus expanding the network of FMIs available in Chile in the payment systems field, with standards comparable to those of advanced countries. A Retail Payments Clearing House (CPBV), specialized in Electronic Fund Transfer (TEF) transactions, and a Clearing House for Large-Value Payments in Foreign Currency to process peso/dollar spot transactions (CCAV FX). Both clearing houses settle their transactions in the Sistema LBTR.*

*These two new FMIs are the result of regulatory and operational developments of the BCCh, which have allowed channeling, within a scheme of appropriate safeguards and following international standards, private sector projects that will be important for improving and strengthening the functioning of the payments and financial market in Chile.*

*These steps forward are part of the BCCh's Payments Agenda which, in the area of infrastructure development and payment systems, considers continuing with the implementation of other CPBV projects currently under way, and evaluating a next phase of this regulation. Also considered is the continued improvement of specialized infrastructures in the forex market and the implementation of the Law to Strengthen the Resilience of the Financial System and its Infrastructures, which, among other measures, will allow for the incorporation of non-bank participants into the Sistema LBTR.*

*Financial Market Infrastructures (FMIs), in every advanced financial market, comprise a network of different entities that make up an essential part of the payments ecosystem, including clearing houses, central counterparties, securities depositories, repositories of derivative transactions and Interbank Payment Systems operated by central banks or Real Time Gross Settlement (RTGS) systems[1]/.*

*The essential function of FMIs is to enable banks and other entities to adequately manage the transactions they carry out, whether they result from the use of means of payment or from the securities market or over the counter (OTC) markets. Specifically, FMIs make it possible to manage legal, financial (such as counterparty or settlement) and operating risks. For these purposes, clearing houses and central counterparties establish mechanisms to accept, clear and subsequently settle their transactions in Sistema LBTRs. Securities depositories record changes in the ownership of securities traded and derivatives repositories record the different transactions carried out in this type of markets.*

*This chapter reviews the main developments of the FMI network in Chile[2]/.*

## RECENT DEVELOPMENTS OF FINANCIAL MARKET INFRASTRUCTURES

### *General Overview*

**During 2024, two new FMIs were added to the existing payments ecosystem: a Retail Payments Clearing House (CPBV) and a Clearing House for Large-Value Payments in Foreign Currency (CCAV FX).** In March 2024, the first CPBV began operations, managed by CCA, a private entity that clears and facilitates the settlement of online Electronic Funds Transfer (TEF) transactions or account-to-account payments, as well as direct debit and credit transactions (called Batch or payroll payments or other scheduled payments). In April 2024, the CCAV FX managed by Combanc S.A., which clears and facilitates the settlement of local spot peso-dollar (spot CLP/USD) interbank transactions, also began operations. Both clearing houses accept operations during defined clearing cycles, to subsequently settle them in the Sistema LBTR in local currency (CLP) and in US dollars (USD[3]/.

**These clearing houses settle in the Sistema LBTR (operated by the BCCh) the net balances resulting from their clearing processes, modifying the profile of transactions processed in each daily cycle.** This is due to a redistribution from the settlement of interbank payments based on gross amounts, as these payments were previously settled by each banking entity in the Sistema LBTR, to a payment on a net basis settled directly by each clearing house, which is detailed below under "Recent developments in the Sistema LBTR".

### *Retail Payments Clearing House for TEFs*

**The widespread use of payment instruments such as payment cards and TEFs has increased risk exposure of financial institutions in Chile.** As shown In Chapter I above, card payments exceed USD 320 million daily, corresponding to payment orders from card issuers to operators or acquirers, who in turn must pay merchants. Online TEFs, meanwhile, have reached a total annual value equivalent to

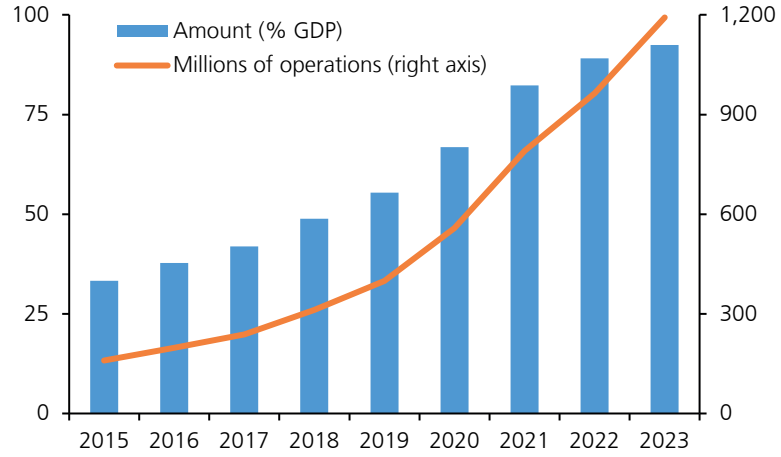
[1]/ See document "Key concepts of payment systems" for a better understanding of the different FMIs.

[2]/ For more statistical information on the follow-up of the different FMIs, see the Statistical Appendix the web site corresponding to this version of the Report.

[3]/ Both clearing houses settle in the CLP Sistema LBTR and only CCAV FX settles through both subsystems MN and USD.

roughly 90% of GDP, on an upward trend over time (Figure II.1)[4]/. According to various international organizations (BIS, 2020) since 2008, TEF processing in Chile has had the characteristics of instant payments, since it ensures real-time, around the clock availability of funds in the receiving client's account[5]/. However, although the funds transferred are immediately available in the accounts of the TEF destination bank and, therefore, from the users' perspective they are perceived as immediate transfers, their settlement between the banks or institutions that offer these accounts takes place hours or even days after the transfer.

**FIGURE II.1** EVOLUTION OF ELECTRONIC FUND TRANSFERS
(annual volume and value)




Source: BCCh based on CCA data.

**To process both payment card and TEF transactions, financial institutions have outsourced the processing and clearing of payment orders to specialized institutions.** In the case of acceptance and reconciliation of payment orders from card payments, the brands (i.e., Visa, Mastercard, American Express) organize and manage the clearing process through a series of rules and protocols, which are settled at commercial banks. In the case of TEFs, the banks have outsourced this process to CCA and Redbanc, for the processing of clearing orders, i.e., verification, acceptance, disposal and aggregation, which was subsequently settled by each bank in the large-value payment systems. This situation does not deviate much from the rest of the world, where card brands are present, and where there are institutions such as Automated Clearing Houses (ACHs) that process interbank transfers, usually not instantaneous.

**The main objective of the regulatory framework for CPBVs issued by the BCCh in 2022 was to strengthen the clearing and settlement processes of the main retail payments (TEFs and payment cards)[6]/.** Formerly, since they were not regulated as FMIs, the clearing of retail payment orders had no risk management systems in place that met international standards, including the necessary financial safeguards in case such risks materialized. For this purpose, the clearing of this type of operations contracted by financial institutions through a CPBV was made mandatory, together with the requirement for CPBVs to have a definition of safeguards applied directly to both the clearing house and its participants. These safeguards also include conditions for the acceptance of clearing orders, guarantees, funds available for settlement, definition of clearing and settlement processes in normal times and in critical situations in case of default by any of its participants, among other requirements.

**The first CPBV to start operations in Chile was the CPBV for TEFs of the Automated Clearing House (CCA), as of March the 6th.** This integrates into the regulatory perimeter a clearing house

[4]/ Percentage calculated using information provided by the CCA clearinghouse administrator, which may differ from statistics compiled by the Financial Market Commission (CMF).

[5]/ See, among others, the documents associated with the World Bank Fast Payments Toolkit (2021); BIS (2017), entre otros.

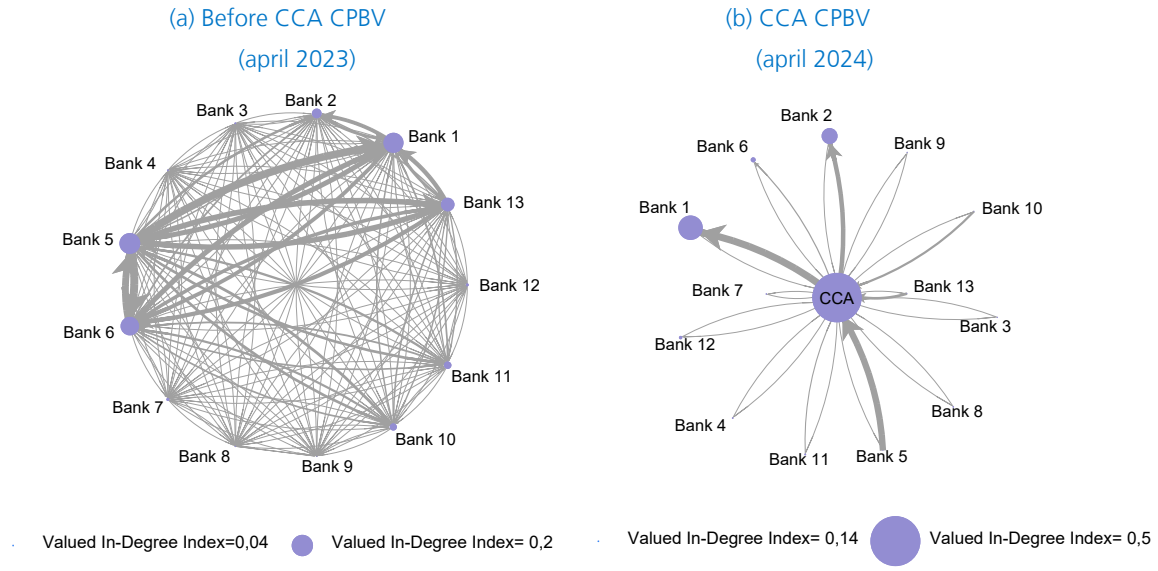
[6]/ See Capítulo III.H.6 in the Central Bank of Chile's Compendium of Financial Regulations.

that currently clears an aggregate amount of annual transactions representing three times the GDP, considering online TEF payments and Batch payments.

**The start of CCA's operation as a CPBV has contributed to closing gaps with respect to international standards in terms of risk management for this type of FMI, thus enhancing the resilience of immediate payments in Chile.** By operating under this regulation, payments accepted by the CPBV become firm and irrevocable, which provides a robust legal support to its operations. This condition implies that the payment must be honored by the participant that has entered it, irrespective of subsequent circumstances affecting it, such as lack of liquidity or even insolvency. In practice, the clearing house must impose mitigating factors, such as limits or guarantees, to safeguard this principle.

**The implementation of this risk management framework allowed for a practical transition from a bilateral gross payment scheme to one based on multilateral net balances, reducing credit and liquidity exposures among participants[7]/.** The operation of CCA under CPBV standards (CCA CPBV) involved implementing a risk management framework with appropriate systems, policies, procedures and controls to identify, monitor and manage risks. Having this more robust management framework in place allows for the management and reduction of the credit exposures of the Clearing House participants and for settlement processes on multilateral net debit balances to be settled at the end of each cycle, instead of settling bilateral gross payments. This reduction of credit risk or exposures between participants is important, depending on their degree of interconnections and TEF activity (Diagram II.1).

**DIAGRAM II.1** NETWORK OF TEF CCA PAYMENT EXPOSURES BEFORE AND AFTER ITS OPERATION AS A CPBV[8]/




Note: The circles vary depending on the Valued In-Degree index, i.e., the proportion of payments received by the participant over the system's totals. The grid is constructed from the daily settlements of the TEF cycles, excluding Batch.

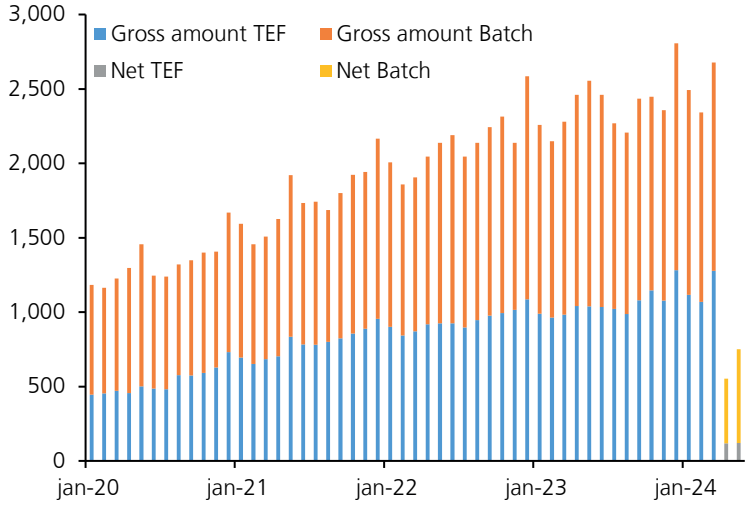
Source: BCCh.

[7]/ The netting of gross positions between CPBV participants is equivalent to the cumulative sum and subtraction of the TEFs sent and received, respectively, by their clients during a trading cycle.

[8]/ It should be noted that the CCA is responsible only for providing a risk management framework for the proper settlement of obligations among its participants and does not assume credit or liquidity risk as an FMI. It is the participants who assume these risks when operating through the Clearing House.

**Because of this, the operation of the CCA CPBV has significant effects on the liquidity management of its participants, which have materialized since the beginning of its operations.** This new way of clearing their obligations implies that participants require almost 80% less liquid money to comply with the obligations resulting from this Clearing House's cycles with respect to the previous gross settlement model, thus reducing their own interbank payments in the Sistema LBTR (figures II.2 and II.8) (ISiP, 2023).

**FIGURE II.2** DAILY AVERAGE AMOUNT PAYABLE FOR CCA OPERATIONS
(billions of pesos)




Note: The average amount settled includes the constituted cash guarantee.
Source: BCCh based on CCA information.

**While in terms of liquidity the entry into operation of CCA CPBV has brought benefits, it has also entailed a better planning of payments by the participants.** In this sense, participants are obliged to settle their balances on a specific schedule, avoiding fines and suspensions. In addition, prior to participating in the cycles, they must establish financial safeguards, either in instruments or prefunding (available liquid funds), which implies making adjustments to their liquidity management.

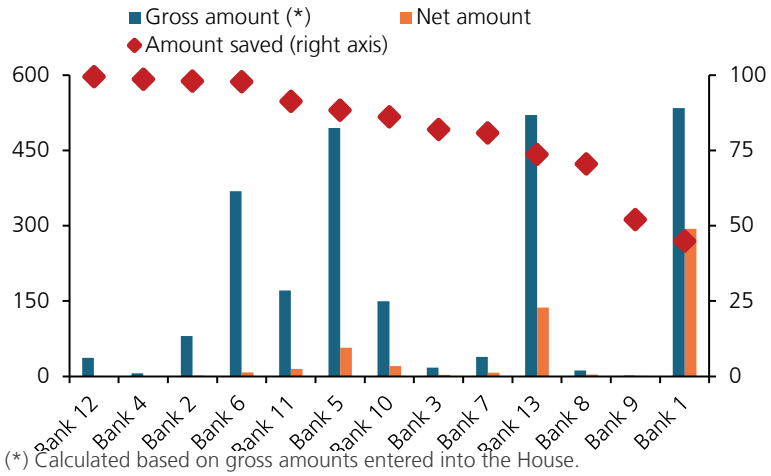
**Liquidity savings, measured as a percentage of compression, are not equal among CCA cycles or among the same clearing house participants[9]/.** With respect to the cycles, the relevant ones for TEF operations show a compression percentage close to 90%, while for Batch operations, it decreases to 65%. On the participants' side, there are net creditor participants, such as banks 2, 4 and 12, and net debtors, such as banks 1 and 13 (Figure II.3). In other words, if all the debit balances of the House's cycles are added up by participant, these banks are, on most days, creditors or debtors, respectively.

**Finally, even for net debtor participants, the compression of positions implies significant liquidity savings compared to the previous situation (Figure II.4).** Thus, net debtor banks, such as banks 1, 5 and 13, reduced their liquidity requirement by an average of almost 70% thanks to the net CCA settlement, while net creditors (banks 2, 4 and 12) reduced their liquidity requirement by almost 100%.

[9]/ Compression percentage refers to the ratio between the value of the net balances settled in a clearing house after the multilateral netting process, over the total of the clearing orders entered.

**Finally, even for net debtor participants, the compression of positions implies significant liquidity savings compared to the previous situation (Figure II.4).** Thus, net debtor banks, such as banks 1, 5 and 13, reduced their liquidity requirement by an average of almost 70% thanks to the net CCA settlement, while net creditors (banks 2, 4 and 12) reduced their liquidity requirement by almost 100%.

**FIGURE II.3** GROSS AND NET AMOUNTS SETTLED BY CCA – APRIL 2024
(average daily amount in billions, percent)




(*) Calculated based on gross amounts entered into the House.
Source: BCCh based on CCA information.

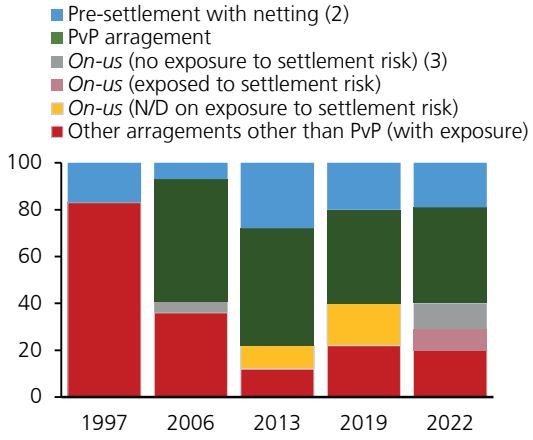
### *Clearing House for Large-Value Payments in Foreign Currency for peso/dollar operations*

**Foreign Exchange (FX) transactions are commonly associated with settlement risk, which is the risk of loss when one of the counterparties delivers the currency it sells but does not receive the currency it buys[10]/.** To mitigate this risk, over the years regulators and international bodies have pursued the adoption of the Payment versus Payment (PvP) standard, which is a settlement mechanism that ensures that the final payment or settlement of a payment in one currency occurs if and only if the final settlement in the other currency has taken place. In 2023, the Committee on Payments and Market Infrastructures of the Bank for International Settlements (BIS) reviewed the adoption of this standard around the world[11]/. According to this report, in April 2022 about one-third of the deliverable foreign exchange turnover was settled with potential exposure to settlement risk (Figure II.4).

**In Chile, the depth of the Chilean spot market stands out when compared to similar economies, so adequate risk management is relevant.** Measuring depth as the level of annualized traded amount divided by GDP, Chile remains above the averages of emerging and Latin American economies, and above advanced economies during the last decade, with a dominant share of the U.S. dollar currency and above 98% of GDP (Figure II.5)[12]/.

[10]/ For further information about this risk, see Box II.1 in ISiP (2023).
[11]/ Facilitating greater adoption of payment versus payment (PvP), BIS (2023)
[12]/ Information calculated by BCCh based on information BIS and IMF data. When compared to advanced economies, only in the year 2024 did Chile obtain a slightly lower index.

**FIGURE II.4** SETTLEMENT OF BUSINESS VOLUME IN FOREIGN CURRENCY (1)
(percent of deliverable business volume)



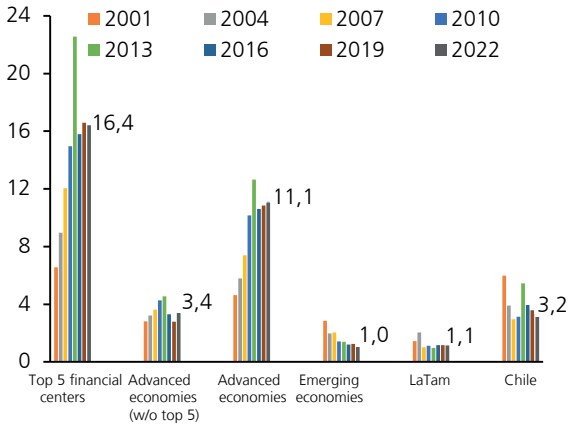

(1) Daily averages in April.

(2) Pre-settlement with netting: participants can clear bilaterally their payments in order to reduce settled amount.

(3) On-Us settlement: is where both legs of a trade are settled across the books of a single institution. The operation is free of settlement risk if both legs are settled simultaneously or there is evidence that the operation will be settled with autorized credit lines.

Source: BIS (2023)

**FIGURE II.5** DEPTH OF SPOT FX MARKET[13]/
(annual transactions/GDP)




Note: Top 5 financial centers are Hong Kong, Japan, Singapur, England y USA.

Source: BCCh, BIS and IMF.

**The BCCh has promoted a set of measures to improve risk management in the processing of FX market transactions.** In a first stage, the BCCh decided to implement an Sistema LBTR that would allow the settlement of transactions in dollars (USD Sistema LBTR), as a necessary condition to ensure an efficient and safe settlement of this type of transactions --coming from the interbank market and other FMIs-- instead of settling these transactions in commercial banks abroad. For this purpose, in 2020 the BCCh issued a regulation defining the characteristics and standards of a new USD Sistema LBTR, which operates in a complementary manner to the traditional Sistema LBTR in local currency (CLP Sistema LBTR).

**These advances made it possible to create the proper conditions to issue a regulatory framework that would establish the requirements to develop a Clearing House for Large-Value Payments in Foreign Currency (CCAV FX), as a complementary measure to strengthen the resilience of this market.** Clearing through a clearing house reduces the underlying risks associated with the forex market, by strengthening its resilience. In particular, it allows the application of financial safeguards, gives finality and irrevocability to payments accepted by the clearing house and facilitates settlement under the PvP standard, thus minimizing settlement risk.

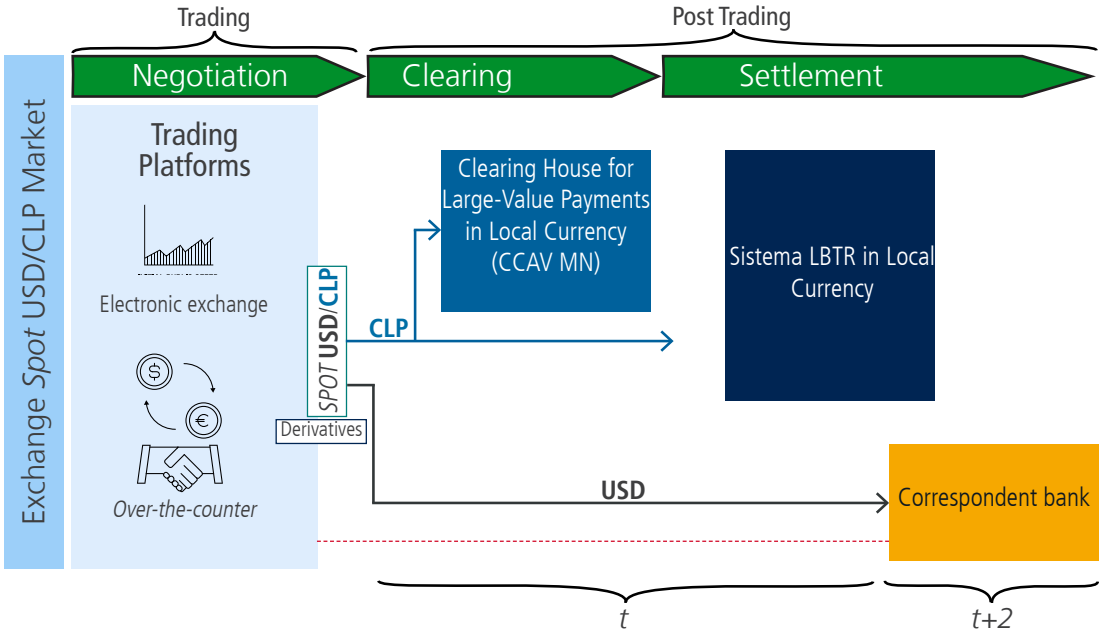
**In particular, an CCAV FX makes it possible to accept, clear and facilitate the settlement of interbank CLP/USD spot market transactions.** This modality was established as an alternative to the bilateral operations commonly carried out in this market, which entail exposure to settlement risk, since the final payment or settlement of each currency does not occur simultaneously (Diagram II.2a). In contrast, the CCAV FX clears and facilitates the settlement of payments by applying a PvP standard,

[13]/ The methodology used to draw up the figure can be found in Appendix 2 of the Bank's Economic and Statistical Study No. 132 (Villena & Hynes, 2020)

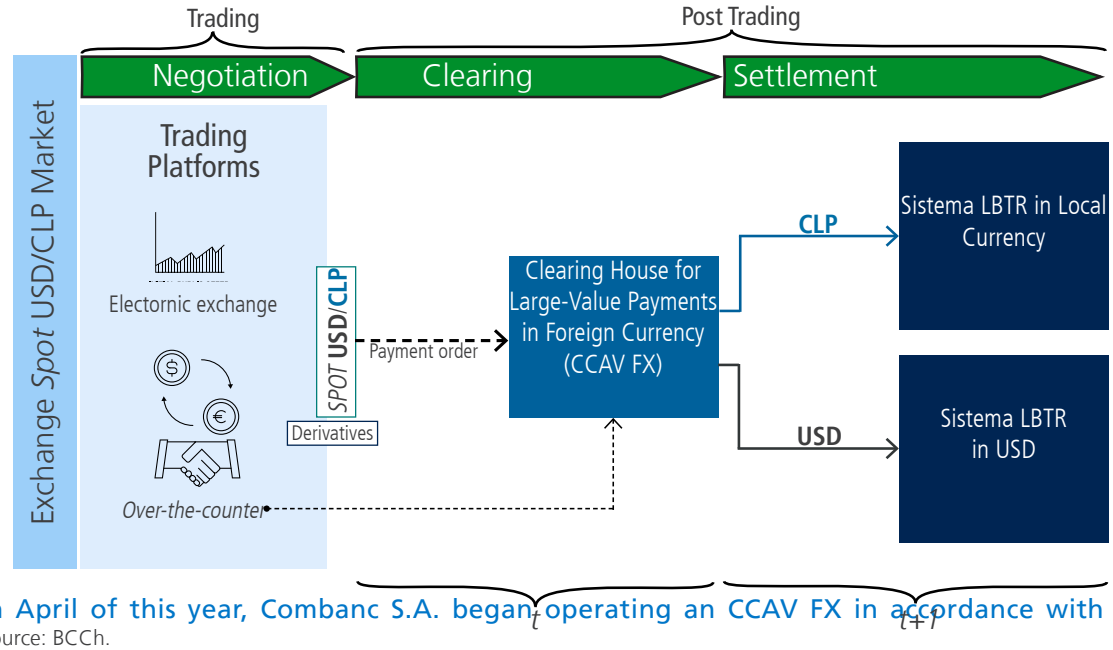
coordinating the payment of each currency of the respective spot operation simultaneously, both in the Sistema LBTR in local currency and in dollars (Diagram II.2b).aplicando un estándar PvP, al coordinar el pago de cada moneda de la respectiva operación *spot* de forma simultánea, tanto en el Sistema LBTR en moneda nacional como en dólares. (Diagrama II.2b).

**DIAGRAM II.2** SPOT CLP/USD PROCESSING BEFORE AND AFTER CCAV FX

(a) Before CCAV FX




(b) After CCAV FX



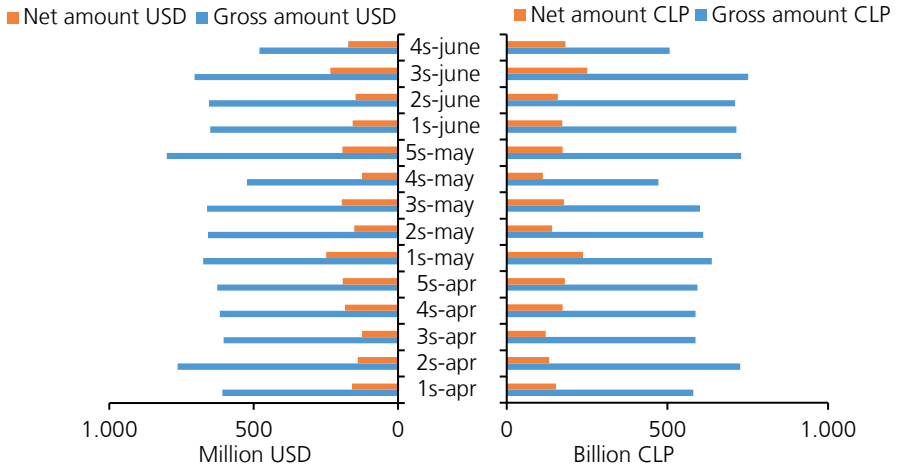

In April of this year, Combanc S.A. began operating an CCAV FX in accordance with the

Source: BCCh.

**regulations issued by the BCCh.** This allows for the acceptance and clearing on a net basis of payment orders arising from the purchase/sale of dollars in the interbank spot market, subject to the corresponding simultaneous settlement conditions in the CLP Sistema LBTR and in the USD Sistema LBTR, for the peso and dollar tranches involved in these operations.

**Since the beginning of the CCAV FX operation, liquidity savings have materialized for its participants in the two currencies, estimated at an average of 74%, as they moved from payments made on a gross clearing basis to a net one (Figure II.6).** Similar to the CCA CPBV, the CCAV FX allows the netting out of payment orders from the purchase/sale of dollars in the interbank spot market. Thus, in the case of a CLP/USD spot transaction, instead of having to pay the full amount of the pesos required to complete the dollar purchase, the participant can pay only the net amount resulting from the difference between the dollar buy and sell orders entered during a trading cycle[14]/.

**FIGURE II.6** AMOUNTS CLEARED AND SETTLED BY CCAV FX
(daily average per week)



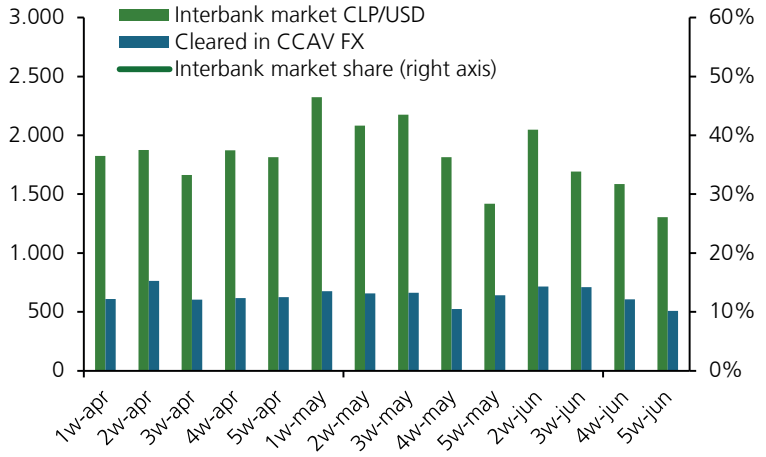

Source: BCCh based on Combanc FX information

**In its first month of operation, the CCAV FX is estimated to have processed on average about 36% of the local interbank spot market, with potential for growth (Figure II.7).** In particular, this entity is currently processing mainly USD/CLP spot transactions made directly between banks through the interbank transactional platform commonly used for these operations. However, transactions arising from some derivatives contracts with physical delivery, such as FX Swap, for the time being can only be entered by banks directly to the Clearing House or continue to be processed bilaterally[15]/.

[14]/ In case the participants are net buyers of US dollars, they will obtain liquidity benefits in pesos, since by netting their buying/selling positions of dollars during a cycle, they will have to pay a lower amount in pesos in relation to the total amount of dollars purchased. The same applies for net sellers, but in reverse. Liquidity savings levels are, by construction, equivalent in both currencies.

[15]/ As for non-delivery forwards ot NDF USD/CLP, they are processed for clearance and later settlement by the ComDer Contraparte Central infrastructure.

**FIGURE II.7** INTERBANK CLP/USD SPOT OPERATIONS
(daily average amount in millions of dollars, percent of total interbank market)




Source: BCCh based on SIID-TR and Combank FX information.

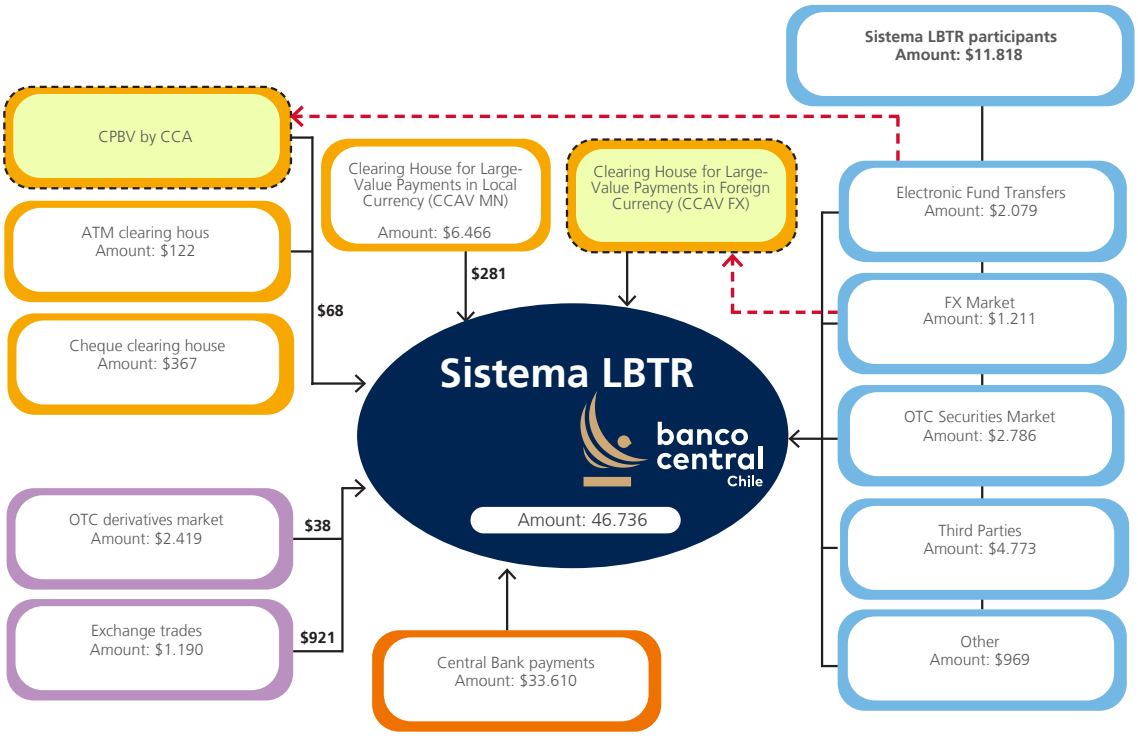
**It is expected that, after an initial period of operation, both this Clearing House and its participants will identify and incorporate the necessary adjustments that will allow a greater proportion of operations to be incorporated.** In the immediate future, there are possibilities for improvement. The option of connecting other platforms or brokers directly to this clearing house is envisaged, which could also expand the processing of spot from deliverable derivatives and add the participation of entities such as brokers or securities agents. On the other hand, it is possible to improve the internal operating mechanisms of the clearing house in terms of operating limits for each participant or extending working hours. About this last point, in June 2024 the BCCh decided to extend operating hours for fund transfer requests (OPB) and credit advice notices (ABN) in correspondent banks, in dollars, made through the Payment Portal Systems[16]/.

## RECENT DEVELOPMENTS IN THE SISTEMA LBTR

**The Sistema LBTRs are commonly considered the backbone of robust financial markets, as they facilitate the settlement of all payments in the economy between financial institutions (Diagram II.3).** In Chile, the Sistema LBTR settles or extinguishes payments that can be grouped according to four main categories: i) payments coming from net balances obtained by clearing houses and central counterparties for the purchase/sale of securities (in purple) or ii) those obtained by clearing houses from transactions based on high and low value payments (in yellow); iii) payments coming from the Sistema LBTR's participants themselves (in light blue); and iv) payments coming from transactions between the BCCh and banking institutions (in orange).

[16]/ See Carta Circular Bancos N°725

**DIAGRAM II.3** PAYMENTS SETTLED IN SISTEMA LBTR (2023)
(average daily amounts in millions of dollars)




Source: BCCh.

**The total daily average value of settlements of the Sistema LBTR MN and Sistema LBTR USD amounted to USD 46.74 billion in 2023 and USD 1.646 billion in 2023, respectively (tables II.1 and II.2)**[17]/. The amount of both systems is equivalent to 14% of GDP at current 2023 prices. The variations in the amounts settled in the Sistema LBTR MN and USD between 2022 and 2023 are mainly explained by the decrease in payments between banks and the BCCh, continuing the normalization trend after the pandemic and exceptional measures applied by the BCCh. The opposite occurs in the USD Sistema LBTR during the first quarter of 2024, where payments for the constitution of overnight deposits of a particular participant led to an increase in payments with the BCCh.

**The new FMIs settle their payments processed in the Sistema LBTR, reconfiguring the existing payment network (Diagram II.3, dashed red lines).** Prior to their entry into operation, the payments associated with the transactions currently accepted by these two new clearing houses were settled directly by the banks themselves as interbank payments, either gross through the Sistema LBTR or, to a lesser extent, with prior processing on a net basis through the Clearing House for Large-Value Payments in Local Currency operated by Combanc S.A[18]/.

**31.Since the implementation of these new FMIs, almost all the payments associated with the settlement of TEF transactions are settled on a net basis by the CPBV CCA, while a proportion close to 40% of the CLP/USD spot transactions in the interbank market are processed through the CCAV FX[19]/.** As mentioned above, the CPBV settles the net balances derived from its respective trading cycles through the CLP Sistema LBTR. Meanwhile, the CCAV FX settles the net balances derived from

[17]/ The amount in dollars settled in the CLP Sistema LBTR was calculated considering an exchange rate of 839 CLP/USD.

[18]/ In the case of TEF transactions, payments were settled interbank in the Sistema LBTR or through ComBanc, in a 75% and 25% proportion, respectively. In turn, in the case of USD/CLP spot transactions, payments in dollars were 100% settled gross through correspondent banks, while payments in pesos were settled interbank in the Sistema LBTR or through ComBanc, in a 60%/40% proportion.

spot transactions accepted during the previous business day's clearing cycle, under the PvP mechanism in the Sistema LBTRs in pesos and in US dollars.

**The above has an impact on the amounts settled in the CLP Sistema LBTR, as it reduces the own interbank payments settled for TEF and CLP/USD spot transactions.** As anticipated in the ISiP

**TABLE II.1** AVERAGE DAILY AMOUNT SETTLED IN THE CLP SISTEMA LBTR
(millions of dollars)

| | Annual | | | | Quarterly | |
|---|---|---|---|---|---|---|
| | 2020 | 2021 | 2022 | 2023 | I.23 | I.24 |
| **Participants** | **13.979** | **12.851** | **10.874** | **11.820** | **10.807** | **11.672** |
| Interbank | 3.065 | 3.385 | 3.400 | 4.260 | 4.148 | 3.708 |
| Third-parties | 5.317 | 5.875 | 4.505 | 4.773 | 4.388 | 4.764 |
| Settlement of OTC securities | 5.598 | 3.591 | 2.969 | 2.786 | 2.271 | 3.200 |
| **Clearing Houses Settlements** | **1.316** | **1.280** | **1.171** | **1.309** | **1.273** | **1.337** |
| ATMs and Cheques clearing houses | 88 | 103 | 76 | 68 | 69 | 56 |
| CCA | - | - | - | - | - | 269 |
| CCLV ECC | 43 | 54 | 50 | 36 | 36 | 30 |
| CCLV SCLV | 858 | 787 | 735 | 886 | 864 | 695 |
| ComDer | 46 | 57 | 47 | 38 | 30 | 33 |
| ComBanc | 282 | 280 | 262 | 281 | 274 | 255 |
| **Payments with the Central Bank** | **35.048** | **49.045** | **34.742** | **33.607** | **33.788** | **23.599** |
| **Total Payments Sistema LBTR** | **50.344** | **63.176** | **46.787** | **46.736** | **45.868** | **36.609** |

Source: BCCh.

**TABLE II.2** AVERAGE DAILY VALUE SETTLED IN THE SYSTEM USD SISTEMA LBTR
(millions of dollars)

| | Annual | | | Quarterly | |
|---|---|---|---|---|---|
| | 2021 | 2022 | 2023 | I.23 | I.24 |
| **Participants** | **31** | **33** | **27** | **28** | **25** |
| Interbank | 23 | 21 | 18 | 18 | 17 |
| Third-parties | 0 | 0 | 0 | 0 | 0 |
| Cheque clearing house | 8 | 12 | 9 | 10 | 8 |
| **Payments with the Central Bank** | **7.016** | **2.372** | **1.609** | **1.591** | **2.846** |
| Correspondent banks (debit+credit) | 1.825 | 1.076 | 757 | 802 | 1.108 |
| Overnight deposit movements | 5.002 | 1.127 | 702 | 664 | 1.607 |
| Other | 189 | 169 | 150 | 126 | 131 |
| **Total payments Sistema LBTR USD** | **7.047** | **2.406** | **1.636** | **1.619** | **2.871** |

Source: BCCh.

[19]/ A smaller share of TEF-related payments is processed by another market entity, which is currently in the process of being incorporated as a CPBV.

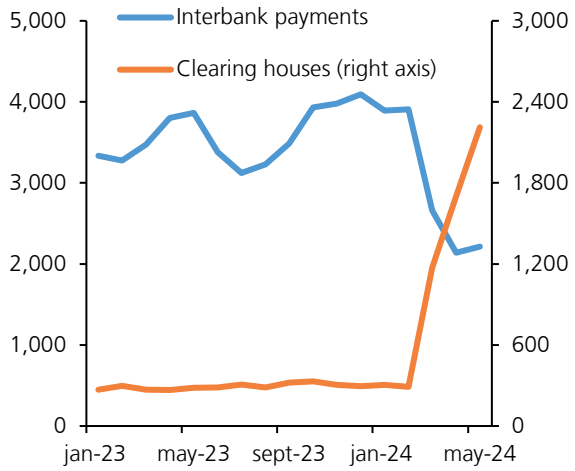
2023, the entry into operation of both clearing houses led to a significant decrease in the settlement of interbank payments on own account in the Sistema LBTR, since part of the transactions accepted by the new FMIs were previously settled gross by this subsystem (Diagram II.3)[20]/.

**At the same time, there is a significant increase in the settlements of net balances of payment clearing houses in both subsystems.** Given that these FMIs settle their net balances through the Sistema LBTR MN and Sistema LBTR USD, payment clearing house settlements, i.e., processing payments from cheque and teller transactions, high and low value and spot CLP/USD, have increased almost 6 and 35 times over the previous quarter, respectively (figures II.8 and II.9; Table II.1).

**As a result of the provisions of the Law to Strengthen the Resilience of the Financial System and its Infrastructures (Resilience Law, approved in December 2023), both FMIs are expected to become non-bank participants in the Sistema LBTR.** Although these clearing houses currently settle their payments in the Sistema LBTR, they do so through the use of accounts owned by the BCCh. Under the new regulatory framework, both administrators and participants of the CPBVs will be entitled to open accounts in the Sistema LBTR to exclusively process payments related to their activities in the CPBVs[21]/.

## As for the migration of the BCCh's Sistema LBTR to ISO 20022 messaging, it is progressing

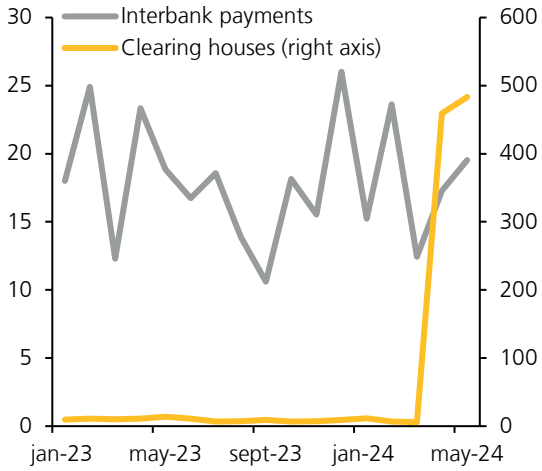
**FIGURE II.8** CLEARING HOUSES' SETTLEMENT IN CLP SISTEMA LBTR
(billions of CLP)




Note: Clearing houses include net balance payments settled by Combanc CLP, Combanc FX, cheque clearing house, teller clearing house and CCA.

Source: BCCh.

**FIGURE II.9** CLEARING HOUSES' SETTLEMENT IN USD SISTEMA LBTR
(millions de USD)




Note: Clearing houses include net balance payments from cheque and Combanc FX clearing houses.

Source: BCCh.

[20]/ Interbank payments under the USD Sistema LBTR do not decrease, as prior to the FX CCAV most of the gross USD amounts of CLP/USD spot transactions were settled through correspondent banks and not through the USD Sistema LBTR.

[21]/ Settlement accounts for CPBV participants will allow them to settle only payments related to cash collateralization or to settle net balances derived from their trading cycles.

**according to its implementation phases.** As announced in the ISiP 2023, the BCCh will modify the acceptable financial messaging in the Sistema LBTR that allows its participants and third parties to give instructions to transfer funds and settle other transactions, pursuant to the regulations in force[22]/. In this regard, the BCCh will use a two-phase approach, with the first phase scheduled for the third quarter of 2024 and the second phase for the second quarter of 2025, thus complying with this change in worldwide messaging[23]/.

## CROSS-COUNTRY COMPARISON

**Most jurisdictions in the world have some type of FMI in their financial system, the most common being real-time gross settlement payment systems and securities depositories, due to their contribution to the settlement of the different operations performed in the economy.** The results of the latest Global Payment Systems Survey conducted by the World Bank (2023) show that, for example, large-value payment systems with real-time gross settlement are widely used in the almost 100 jurisdictions surveyed (Figure II.10). At the same time, less developed countries process their large-value payments through alternative systems that do not offer gross settlement.

**However, higher development degrees require a more diverse set of infrastructures to support the processing of transactions of greater diversity and complexity.** This is the case of Central Counterparties (CCPs) and Transaction Repositories (TRs). CCPs are present in 70%-80% of OECD and East Asia and Pacific countries, and in only 20%-30% of developing economies (Figure II.10). Transaction repositories are even rarer than CCPs, being present in only 30% of OECD countries, mainly because they were promoted after the Global Financial Crisis of 2008.

**In Chile, for more than two decades, different FMIs covering different markets have been gradually implemented, where the Sistema LBTR plays a central role (Diagram II.4, Box II.1).** Today, Chile has at least one institution fulfilling the role of each type of FMI, similar to advanced economies. In the exchange-listed financial instruments market (fixed income, brokerage, equities and exchange-traded derivatives, among others), CCLV Contraparte Central S.A. is the clearing CCP. In the over the counter (OTC) derivatives market, ComDer Contraparte Central S.A. is the CCP that mainly clears non-deliverable forward (NDF) contracts.

**All transactions cleared through the aforementioned infrastructures converge with and are settled through the Sistema LBTR managed by the BCCh, in the case of payments in cash, and through the Central Securities Depository (DCV), in the case of settlement in financial instruments.** Regarding the registration of OTC derivative transactions, the BCCh administers the local RT called Integrated Information System on Derivative Transactions (SIID-TR), which covers the exchange rate, interest rates and inflation derivative markets. Since its entry into force in November 2022, it has developed in line with international standards and best practices, having made significant progress in terms of market transparency and having a new regulation to expand its coverage to other underlying assets[24]/.

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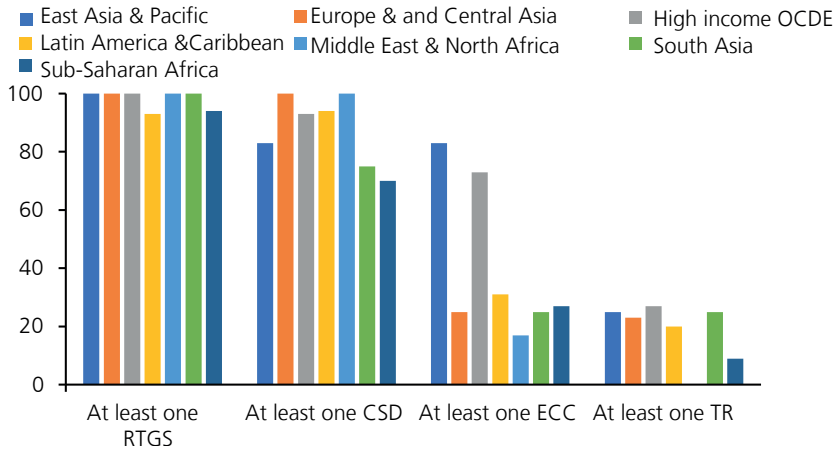
[22]/ The current MT messaging will be migrated to MX messaging. The MX format uses XML (eXtensible Markup Language) to structure financial messages, making them easy to read and automatically processed by computer systems. MX messages cover a wide range of financial transactions, including credit transfers, direct debits and interbank payments, among others.

[23]/ For details see Carta Circular Bancos N°718 and Box III.3 (ISiP, 2023).

[24]/ In January 2024, a new regulation was approved that will allow the incorporation of derivatives transactions on commodities, equities and stock indexes that are carried out in international markets. This regulation will come into force in January 2026. For more information on the SIID-TR, see previous editions of the ISiP or click here.

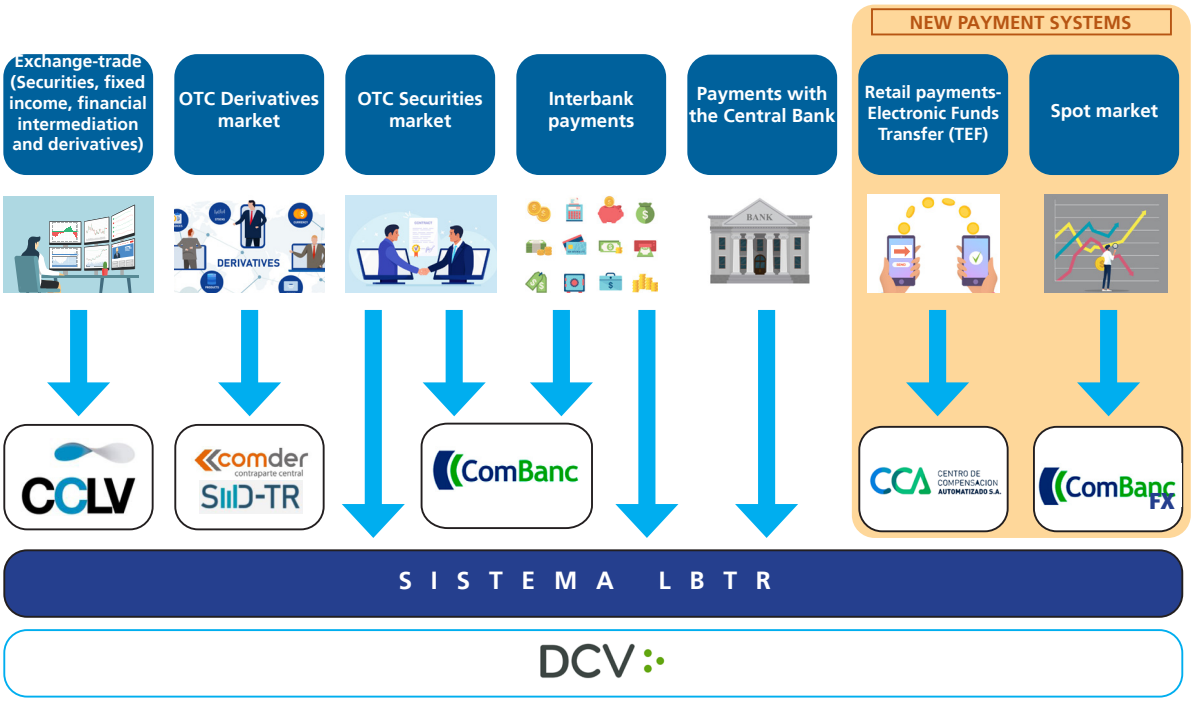
**FIGURE II.10** PRESENCE OF FINANCIAL MARKET INFRASTRUCTURES IN THE WORLD
(percent of total jurisdictions surveyed)




Note: Questions are mutually independent, so the total number of respondents may vary. For these questions, the total number of jurisdictions that responded was 98, 86, 81 and 78, for the RTGS, DCV, ECC and TR system, respectively. Chile is included in the "OECD" group.

Source: BCCh based on the document Global Payment Systems Survey – 6th iteration (October 2023), the World Bank.

**DIAGRAM II.4** FINANCIAL MARKET INFRASTRUCTURES




Source: BCCh.

**Although the presence of payment systems and other infrastructures is extensive, there is room for greater coverage in the processing of financial transactions by them.** All high value interbank payments are made in regulated payment systems, either the Sistema LBTR and/or Combanc; however, interbank payments in foreign currency are processed to a lesser extent by the Sistema LBTR in U.S. dollars. It is expected that this situation will tend to improve significantly with the operation of the CCAV FX, as described in this Chapter. Regarding OTC derivatives, ComDer processes around 60% of inflation and peso-dollar NDFs, but other derivatives such as rates are not processed by this ECC or other local FMI.

**In the case of fixed- and variable- income instruments, on average 40% and 70% of the total amounts traded in these markets are processed by the clearing house or ECC of the Santiago Stock Exchange, CCLV.** At low value, until February 2024, all interbank payments from TEFs and card payments were cleared outside regulated FMIs, a situation that changed substantially with the incorporation of CPBVs. Meanwhile, card payments are on the way to being cleared through this type of clearing houses, because there are projects in the process of obtaining operating authorization from the Financial Market Commission (CMF).

## POLICY DEVELOPMENTS

**As announced in 2022, the BCCh will develop a second phase of the regulatory framework for CPBVS, while continuing with the implementation of the current regulation.** As reported in the previous ISiP, the BCCh is developing a second phase of regulation for CPBVs; in principle, adapting conditions and requirements based on the performance and behavior of each of the types of clearing houses that may be developed, considering the implementation process so far. Likewise, it is planned to advance in requirements that promote adequate interoperability, both among the different CPBVs and in requirements or standards necessary for a simpler and more fluid entry of operations (in line with the objectives reviewed in Chapter III). In relation to the implementation of current regulations, during 2024 new CPBVs are expected to be integrated to the infrastructure network, in either a definitive or experimental mode, which will process both payments from payment card transactions and electronic fund transfers[25]/. In this regard, it is important that the financial institutions participating in these future clearinghouses adopt in a timely manner the measures or actions that may be necessary to ensure the smooth start-up of the operation of each CPBV.

**The Resilience Act will allow the BCCh to expand the capacity of the Sistema LBTR to new functionalities and participants.** To this end, the BCCh is working on regulatory developments to facilitate the connection of new non-bank institutions allowed by this Law to the Sistema LBTR, as well as on the provision of other services, including liquidity or deposit facilities, where applicable. Along these lines, some FMIs, as is the case of ECCs, could have access to the remuneration facility for deposits they make in BCCh accounts for cash collateral, for which the BCCh is currently evaluating the terms and conditions necessary for its materialization (Box III.2 ISiP 2023).

[25]/ The purpose of the CPBV experimental modality is to facilitate the clearing of operations based on new business models or the integration into the regulatory perimeter of entities already operating, but which clear a low volume of transactions (average daily gross payment orders for less than 2.5 million UFs for 24 months).

**Regarding the processing of the CLP/USD spot foreign exchange market, gaps and areas for improvement that need to be overcome will continue to be identified in order to continue promoting the adoption of the PvP standard.** In this matter, in addition to continuing to monitor the implementation of the CCAV FX regulation, the BCCh is evaluating the incorporation of this standard in the settlement of payments of this type of transactions entered directly into the Sistema LBTRs, allowing the simultaneous settlement of both currencies in gross terms.

**The BCCh, in line with its mandate to safeguard the normal functioning of payments, will continue to monitor the functioning of the FMIs currently in operation in this field.** Its objective is to detect areas for improvement and follow new technological breakthroughs and trends that may be applicable to them, in accordance with the guidelines of its Strategic Plan 2023-2027 in terms of modernizing and adapting BCCh infrastructures to the challenges ahead.

BOX II.1:

## Twenty years of the Sistema LBTR in Chile: Main developments, initiatives and challenges

**Real-time gross settlement payment systems in central bank money, such as the BCCh's RTGS system called Sistema LBTR, are indispensable for the proper functioning of modern economies.** These systems allow for the settlement of payments for all transactions between financial institutions in the market, regardless of whether they involve low or high value transactions, or the exchange of securities or instruments.

**By operating the Sistema LBTR, in a manner that complements the role of regulating payment systems and means in the country, the BCCh fulfills its legal mandate of safeguarding the normal functioning of payments.** In both roles the objectives are to enhance the security and efficiency of payment systems and, in particular the operation of the RTGS system to mitigate credit and settlement risk between financial institutions, taking into account international principles and standards.

**In 2024, after 20 years of operation of the Sistema LBTR, it is important to highlight its performance, development and constant strengthening, as well as to review the next challenges it faces in order to continue fulfilling its objective and central role in Chile's payment ecosystem.**

### *The beginnings[26]/*

**Prior to the existence of the Sistema LBTR, interbank payments, both high-value and retail, were processed in a decentralized manner in clearinghouses.** In particular, the clearinghouse for cheques and other documents processed payments from the banking system, the net balances of which were offset on a deferred basis at the end of the day or the following day. This clearinghouse was operated by the very banking institutions and did not have its own liquidity safeguards, nor limits on the bilateral or multilateral obligations that the participating banks could assume. Despite these weaknesses, the system functioned smoothly because the BCCh played an indirect role, assuming the settlement risk, that is, covering any net balance if an institution failed to make a payment[27]/.

**At the end of 2000, in accordance with its legal mandate, and like other economies in the world, the BCCh initiated a program to modernize the large-value and systemically important payment systems, which had as its core the creation of the Sistema LBTR.** With the aim of bringing these systems into line with current international standards, increasing the security and efficiency of payments, the BCCh issued a regulation creating the Sistema LBTR at the beginning of 2004, which began operations the same year. This milestone allowed participating banks to transfer funds through

[26]/ See BCCh presentations on the modernization of the payment system (2005, 2006) and box "Modernization of payment systems in Chile" in the Financial Stability Report for the first half of 2004.

[27]/ Regarding securities settlement, the only payment services available for non-bank financial intermediaries were bank-issued cashier's checks, which were manually transferred and became effectively available on the following day. Settlement of transactions was generally carried out on a gross basis, transaction by transaction, for both cash payments as well as securities.

movements from their settlement accounts at the BCCh, using high-security messaging that allows payment orders to be sent for settlement one by one and instantaneously, that is, in real time and in bulk, as long as the issuing participant has sufficient funds in its settlement account. Once settled, the transfer is final and irrevocable.

**The Sistema LBTR mitigates the settlement risk for participants, but it must still have mechanisms to mitigate the liquidity risk.** In a RTGS system, a lack of funds on the part of a participant that prevents a payment from being settled can in turn prevent other payments in the system from being made, causing a gridlock in the payment chain that can materialize as liquidity risk. To mitigate this, the Sistema LBTR had automated mechanisms to resolve potential gridlocks of pending payments, such as payment prioritization, thus making the use of liquidity in the system more efficient. As a complementary instrument, the BCCh implemented the Intraday Liquidity Facility (FLI) to provide liquidity to participants through REPO contracts (repurchase agreements) with the BCCh.

**At the same time, in 2005, a Clearing House for Large-Value Payments in Local Currency (CCAV MN) began operating, run by Combanc and authorized under new BCCh regulations.** This Clearinghouse acts in a manner complementary to the Sistema LBTR, allowing for the offsetting of payments on a net basis with deferred settlement. This allows for operations with liquidity savings for the participants of the Clearinghouse, but with credit risk, so it incorporates risk mitigators. One of them is that the result of the clearing process must be settled in the Sistema LBTR in accounts at the BCCh. This also occurred with the Check and ATM Clearinghouses, which process low-value payments.

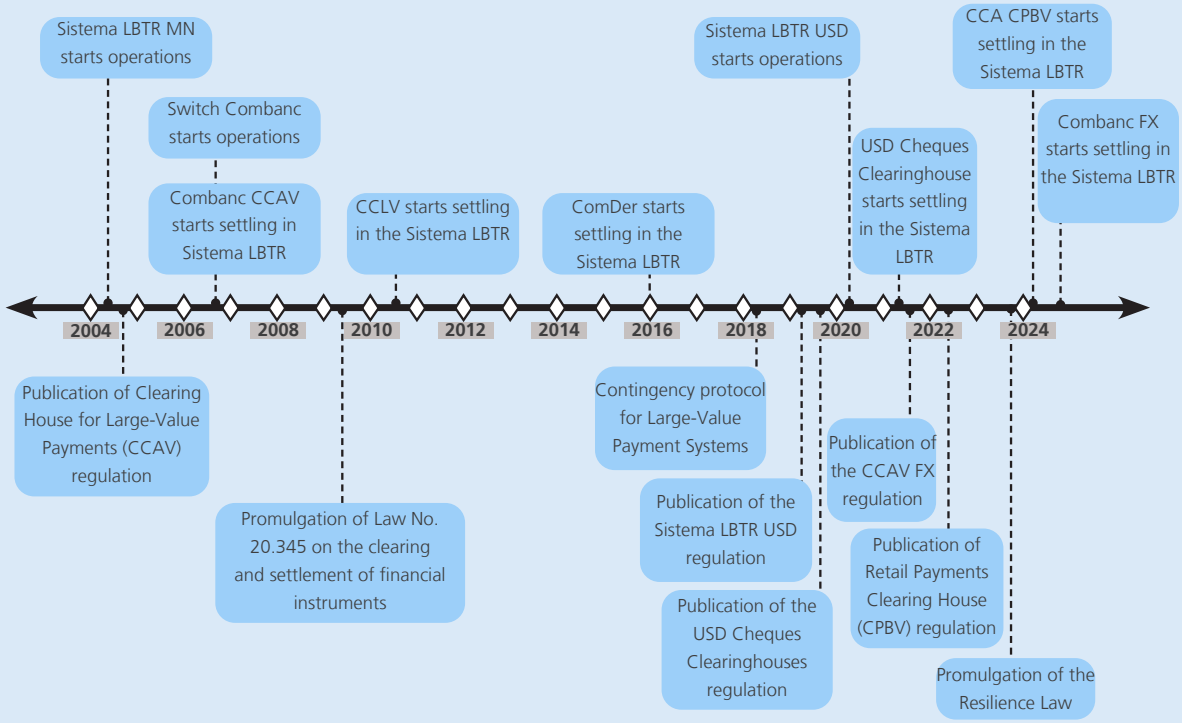
**The implementation of other financial market infrastructures and the development of the foreign exchange market involved the adaptation and further modification of the Sistema LBTR.** Allowing Clearinghouses to settle in the Sistema LBTR as a way of mitigating systemic risk has not been the only initiative. Later, after a process of modernization of securities clearing and settlement that began in 2008, the Santiago Stock Exchange's Securities Clearing and Settlement House (CCLV in Spanish) began operations in 2010 and, subsequently, the OTC Derivatives Clearing and Settlement System, operated by ComDer, began operations in 2015. These two new infrastructures were incorporated into the Sistema LBTR to carry out the daily settlement of their transactions[28]/. More recently, in 2020, it began operating in dollars (Sistema LBTR USD), which enabled a settlement system between the dollar accounts of the institutions in the BCCh, and which will be essential for the settlement of the next clearinghouses that require settlement in that currency. For a complete history of the developments associated with the Sistema LBTR, see Diagram II.5.

**Over these 20 years, the Sistema LBTR has maintained a high standard in terms of operational risk control and availability, averaging 99.96% uptime for operations[29]/.** Likewise, it has permanently complied with international principles regarding payment systems, in particular, with the Principles for Financial Market Infrastructures (PFMI) promoted internationally by the Bank for International Settlements and the International Organization of Securities Commissions.

[28]/ Additionally, the RTGS System interoperates for some financial operations with the Central Securities Depository, in particular for the synchronization of the process of money movement with the release or change of ownership of BCCh instruments, of open market operations. A similar solution, but for the transaction of other financial instruments between private entities managed by Combanc (Switch), also interoperates with the RTGS System. financial entities, as provided in Article 11 of Law No. 20,009.

[29]/ This is equivalent to an average unavailability of 50 minutes in a year.

**DIAGRAM II.5** AT 20 YEARS OF THE RTGS SYSTEM IN CHILE: MAIN REGULATORY AND OPERATIONAL MILESTONES




Source: BCCh.

### *Recent developments and more immediate challenges*

**The process of incorporating the settlement of clearinghouses into the Sistema LBTR has intensified recently.** In addition to the ACH, the first Retail Payments Clearing House (CPBV), and the Clearing House for Large-Value Payments in Foreign Currency (CCAV FX) operated by Combanc, which began to settle in the Sistema LBTR in March and April of this year, respectively, it is expected that other CPBVs will join in the near future[30]/.Although settlement in the Sistema LBTR is voluntary for the latter, the benefits in terms of risk can generate incentives to join the system.

**Added to the above is the recent promulgation of the Resilience Law, which contains provisions that will allow direct participation in the Sistema LBTR to be expanded to new non-bank entities, through current and settlement accounts.** The main new players gaining access will be systemically important Savings and Loans Cooperatives, Central Securities Depository entities, and payment clearinghouses, such as CCAVs and CPBVs, as well as their participants, who will now be able

[30]/ See Chapter II for details of CCAV FX and CPBV.

to access the system through the direct management of their own accounts[31]/.

**A greater diversity of entities participating in the Sistema LBTR imposes challenges in terms of adaptability and, at the same time, security.** The new entities that will have direct access to the administration of a settlement account have different sizes and complexities from the traditional participants of the Sistema LBTR. For this reason, the BCCh is evaluating and developing the necessary adaptations and requirements both for this system and for the communication procedures of its contingency system. However, on the other hand, it must at the same time strive to maintain the current standard of security and operation of the system.

**In that sense, the incorporation of entities with diverse business models leads to evaluate the change of traditional operational practices.** As part of the most recent measures adopted by the Central Bank of Chile to increase liquidity in the dollar market and promote the use of the Sistema LBTR, on July 1st, the processing hours for fund transfer requests (in Spanish "Orden de Pago Bruta", or OPB) which translates to "Gross Payment Order") and credit notices (in Spanish "Aviso de Abono" or ADA which translates to "Credit Notice") at correspondent banks in US Dollars were extended. In this context, the BCCh is evaluating the need to expand the operating hours of the Sistema LBTR USD, as well as other initiatives aimed in that direction. For instance, the BCCh will evaluate the need to expand the operating hours of the Sistema LBTR in local currency to facilitate the functioning of the stock market.

**The implementation of the new ISO 20022 messaging standard in the Sistema LBTR is a key part of the adoption of international standards and more robust and versatile communication systems.** The ISO 20022 standard, applied to Swift messaging and the Sistema LBTR, will enable more complex messages to be sent with more detailed information, facilitating the automation of processes and improving analysis. The implementation of the new standard consists of a first phase focused on payment messages, which is expected to be completed in the third quarter of 2024, and a second phase for the remaining messaging with an implementation deadline of the second quarter of 2025.

**The implementation of the Sistema LBTR has been one of the most important milestones in the modernization of the payment system in Chile.** As a central payment system that is fundamental to the constantly evolving financial system, the Sistema LBTR has been adapting to the new needs of the market and constantly evaluating new changes, always in accordance with its legal capacities and maintaining high standards of security and operation.

[31]/ Until now, the aforementioned clearinghouses settled in the RTGS System through delegated settlement messaging rather than through account management, as is the case with CCLV and ComDer.

# III. INTEROPERABILITY CHALLENGES IN PAYMENT SYSTEMS

*Having a wide range of payment alternatives is beneficial for every country's economy, as it allows individuals and firms to conduct their daily transactions to acquire goods and services more efficiently, securely, and based on their preferences.*

*In this sense, the process of transformation that digital payment ecosystems have undergone through new technologies, different forms of organization and a greater diversity of payment alternatives has sparked the interest of several central banks.*

*To enhance this transformation process, the interoperability of payment systems is essential, allowing transactions to be carried out seamlessly between different entities, thus avoiding the need for users to participate in multiple systems. This helps to diversify the supply of digital payment services, and is particularly relevant for the development of direct (account-to-account) or instant payments.*

*This chapter reviews the main elements that define the interoperability capacity of digital means of payment, such as payment cards and electronic transfers using various international developments for reference.*

*Based on this analysis, the main challenges to enhance interoperability and the development of electronic funds transfer (EFT) payments in Chile are identified, both for payments between individuals and from individuals to merchants.*

*In this context, considering that EFTs in the country stand out in aspects such as use, immediacy and interoperability, the BCCh has preferred to strengthen the standards of these transactions through its regulation rather than intervening more directly in their operation, as have central banks elsewhere.*

*However, there is room for incorporating new technologies that allow for simpler and more expedited EFT payments to merchants by using, for example, quick response (QR) codes and other aliases. This requires public-private efforts, as well as the strengthening of interoperability standards, in terms of both the capacities and the powers of the BCCh and other financial authorities.*

## INTRODUCTION

**Interoperability is an essential attribute of payment systems, as it allows transactions to be carried out seamlessly between different payment providers, thus avoiding the need for users to participate in multiple systems.** Just as it is possible for two persons to speak over their phones from different telecommunications company, in the financial system it would be expected that a credit card could be used to pay at multiple merchants, irrespective of the banks or financial institutions of the parties involved. Similarly, when instructing a transfer of funds to another person, it should be possible to send and receive the funds if the parties involved are account holders in different financial institutions.

**When payments flow without friction between different account providers, individuals, firms and merchant networks, transactions in the economy become more efficient.** Card payments at a merchant are possible because the customer's account provider interoperates with that of the merchant. The same applies when paying for purchases of goods and services through electronic funds transfers. When this does not happen, frictions occur that could ultimately hinder the transaction from taking place.

**Higher degrees of payment system interoperability have benefits for the economic system.** Some minimum level of interoperability is a necessary condition for a payment instrument to exist and develop. To boost the use of that means of payment, contributing to efficiency and avoiding fragmentation of the system, a higher degree of interoperability is required. This also has the potential to foster competition in payment services, encouraging innovation. Interoperability also contributes to financial inclusion by expanding the coverage, access, usability and availability of payment instruments.

**Interoperability requires that the components of payment systems be able to exchange information through compatible communication channels.** For a means of payment to be used in an open system, there must be mechanisms in place to enable the transmission of messages from the entity originating the payment to the entity receiving it. This depends on advanced technological developments that allow for expedite and secure transmission, as well as the signing of various commercial agreements between the different parties involved in the process[1]/.

**Payment schemes coordinate payment instrument providers under a common set of technical and operational rules, practices and standards that help improve interoperability.** Those that allow payments to merchants typically include the participation of entities specialized in acquiring, which expand and provide services to the network of establishments that accept said means of payment. A good example of this are the card payment schemes, which have played an important role as drivers of digital payments for decades around the world. These schemes, by having established general rules and conditions, have made it possible for cards to be accepted almost without distinction both locally and internationally. Moreover, technological advances have made it possible to extend their use of e-commerce, which has also contributed to increasing their penetration at the global level.

**Complementing the available means of payment, recent years have seen the development of instant or direct payment schemes for merchants in various jurisdictions.** Broadly speaking, these systems are advanced versions of the various direct account-to-account electronic fund transfer (TEF) models, suitable primarily for payments between individuals, with added features that allow for efficient payments to merchants.

[1]/ There are examples of closed payment systems in the world where it is possible to use payment methods expediently at a large number of merchants, if both users and merchants are part of the same system. However, such closed systems can lead to market fragmentation if they do not interoperate with other alternative schemes..

**However, there are significant differences in the way card payment schemes have been consolidated with respect to the latest breakthroughs in direct payments and the challenges they present to interoperability.** The former are long-standing developments, originated in the private sector and managed by a limited number of players who have generated operating rules that facilitate the coordination and interoperability of their components. In the case of TEF-based schemes, a number of private developments have emerged, which tend to fragment in the absence of a framework of sufficiently standardized rules among account providers. This offers a partial explanation for the emergence in some jurisdictions of direct payment schemes promoted by central banks and other authorities, which expressly contemplate interoperability standards whose implementation by the private sector is in some cases mandatory.

**This chapter reviews the main elements defining the interoperability capabilities developed by payment card schemes and, more recently, those of direct or fast payment schemes.** The main determinants of digital payment systems that have been successful in their interoperation capabilities are analyzed, reviewing the most important models that are prevalent at a global level, both for payment card payments and for transfer-based ones. Following this analysis, the main challenges identified to enhance the development of TEF payments in Chile are presented, including the development capabilities of the industry itself and alternatives for the authorities to contribute in this direction.

## INTEROPERABILITY AND PAYMENT SCHEME DEVELOPMENT

**To better describe how different degrees of interoperability can be generated between payment providers, it is important to understand the relationship between the different parties involved in a payment scheme.** A Payment Scheme consists of a set of rules, practices and standards necessary for the provision of a service or means of payment to the public, between different account providers[2]/. These schemes are structured through various combinations of the following core components: (i) one or more financial market infrastructures (FMIs) to process payments, i.e. a clearing house and/or a settlement system (usually a real-time gross settlement (RTGS) system; (ii) ancillary systems, such as messaging, authorization, registration, and even fraud detection systems; (iii) proxy databases, managed through computer programs that enable account-holder identifiers and; (iv) a network of merchants, affiliated to the Scheme through entities specialized in this function, internationally known as "acquirers" (Diagram III.1)[3]/.

**Different schemes have different contractual arrangements, where the management of the rules and protocols that define them may lie with a single institution, or with several institutions or elements that make up the scheme.** For example, in the case of card payment schemes, it is the card brands that coordinate by defining a framework of licenses and rules, but they do not own or play the roles of each component of the scheme.

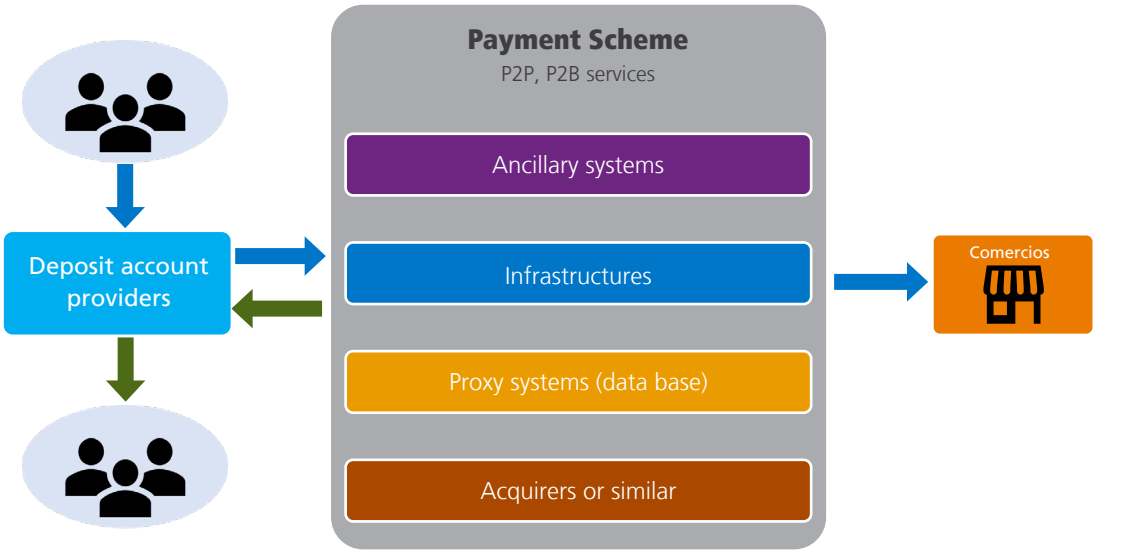
**It is important to distinguish between payment schemes and payment services or instruments. A Payment Scheme may allow the operation of one or more payment services or instruments.** For example, payment schemes with cards traditionally allow the operation of a physical card as a payment instrument accepted by various merchants. However, these same schemes have been incorporating new payment services in association with different applications provided by technological companies, such as,

[2]/ This definition of payment scheme is based on the *Glossary Of Terms Related To Payment, Clearing And Settlement Systems* and is consistent with other publications, (e.g. World Bank (2021)).

[3]/ Proxy identifiers are alphanumeric codes or terms associated with deposit accounts.

for example, various payment modalities through QR codes or the like[4]/. In turn, direct payment schemes through transfers between accounts, which until a few years ago allowed mainly person-to-person (P2P) payments, have been evolving globally towards more complex payment services, incorporating specialized acquiring systems to affiliate business networks (person-to-business or P2B). P2P direct payments have entailed a progressive substitution of payments made through other payment instruments, such as cheques and cash, and the same may occur in the case of P2B payments, by extending the options for paying digitally.

**DIAGRAM III.1** PAYMENT SCHEME AND ITS COMPONENTS




**Messaging, authorization, registration and even fraud detection systems**
**Clearing and/or settlement houses or systems (i.e., RTGS)**
**Computerized systems for the management of identifiers associated with current account information**
**Network managing the affiliation and administration of payments to the recipient, in particular those to merchants**

Source: BCCh.

**Payment means providers may interoperate with each other through the various payment schemes available in each jurisdiction.** The availability of payment schemes differs from one country to another. To the extent that a given scheme allows more open participation (membership) conditions to a larger number of account providers, a higher degree of interoperability will naturally be achieved. In general, the most successful schemes allow access to all account providers in a given financial market. However, if different payment services are provided through multiple schemes, interoperability between these schemes becomes more important.

[4]/ A QR code is a barcode containing horizontal and vertical patterns that can be scanned and decoded optically. Most smartphone users can use their cameras to scan the QR code and initiate an action, such as opening a link to a website, viewing a restaurant menu or even initiating a payment.

## INTEROPERABILITY DETERMINANTS OF CARD PAYMENT SCHEMES

**Payment schemes with cards and equivalent systems have played an important role in the massification of digital payments around the world.** These schemes emerged decades ago as an alternative to cash and cheque payments and could also provide credit. Over time, the cards, which were originally used face-to-face and their payments processed in a rather rudimentary way, were digitized, which allowed their use to expand significantly. This is reflected in the fact that, globally, in both developed and emerging economies, more than half of all payment transactions are made with one card or another (Di Iorio et al, 2024).

**One of the attributes offered by card payment schemes is their degree of interoperability.** Their technological and contractual standards and protocols are applied by card issuers and acquirers, allowing payments to be made at hundreds of thousands of merchants in different countries, without regard to the currency of the account of origin or the issuer, and without any contractual links between the issuer and the local acquirers.

**In general, financial institutions that provide or issue payment cards do so in association with international brands.** A key element in people's demand for payment cards is that they can be used in broad commercial networks[5]/. While it is conceptually possible for an issuer to directly affiliate merchants to accept its cards, and in Chile there are credit cards from non-bank issuers whose acceptance is restricted to specific merchants, it is more common for card issuers to partner with one or more of the major international brands, maximizing usage options for their customers.

**These international brands administer payment schemes to which almost every account provider and acquirer adheres.** The operation of these schemes allows individuals, whatever the financial institution that provides them with a payment card, to use it in extensive networks of merchants that accept this means of payment. But it also has the practical effect of producing interoperability, without each of the components of the schemes necessarily having to interoperate with each other, which is defined in some cases as "parallel schemes." A very important element of this is the existence of entities that adhere merchants to the networks of these schemes, which, similarly to account providers, tend to participate in the mainstream card schemes, thus allowing merchants to accept payments with cards associated to the different schemes (Diagram III.2).

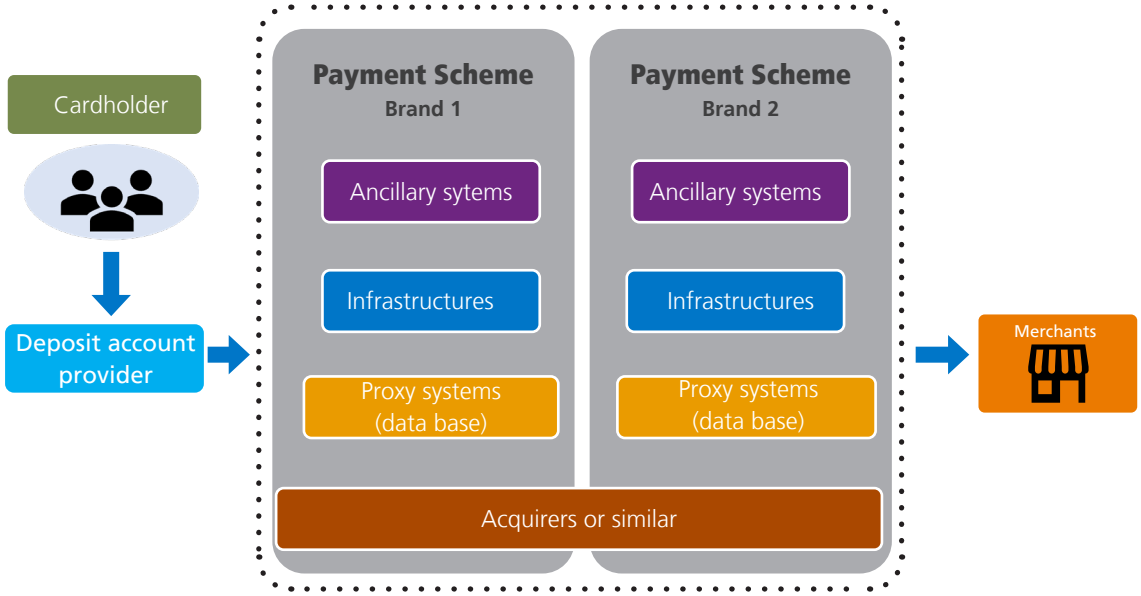
**For cards to be accepted at merchants, acquirers or sub-acquirers, they must be affiliated with the respective schemes.** These entities provide merchants with the instruments that enable payment acceptance, typically a "point of sale" (POS) or payment button, for online transactions, and assume payment responsibility for transactions made with cards. To offer their services, acquirers also contractually bind themselves to the card brands and adhere to the corresponding terms and conditions of operation.

**Usually, these schemes are organized in what is known as the "four-party model" (4PM), which facilitates the interoperability of these means of payment.** In 4PM, card issuance and acquiring are unlinked, so acquirers can affiliate merchants to the different card schemes without requiring a mandate from the issuers. Thus, an acquirer has a more complete range of services when it is affiliated to more schemes, so that, even though theoretically there could be acquirers for specific brands --which has been the case in the past in other countries-- it is usual for these entities to obtain acquiring licenses for the main brands operating in a given country. This is so because merchants usually prefer to accept multiple means of payment in order not to lose sales by not having the option to accept a particular instrument[6]/.

[5]/ Ching y Hayashi (2010) note that incentives provided by issuers such as benefits and rewards programs also influence the use of payment cards.

[6]/ It should be noted that there are common technological standards in POS and cards, such as chips and contactless technology, which allow the operation of these devices with cards associated with different brands.

**DIAGRAM III.2** PARALLEL CARD PAYMENT SCHEMES AND THEIR COMPONENTS




Source: BCCh.

**The operation of these schemes is complemented by various ancillary services.** Other entities are also involved in the processing of card payments, in technical aspects such as messaging, fraud prevention and card reading technology. The implementation of these attributes, both in issuing and acquiring, follows the Scheme's rules, which allow cards to have similar characteristics globally, and their reading and processing can be performed by any acquirer. This includes, for example, alliances with technology companies to improve the user's experience when paying, such as incorporating the card into a virtual wallet or a device such as a cell phone, watch or bracelet.

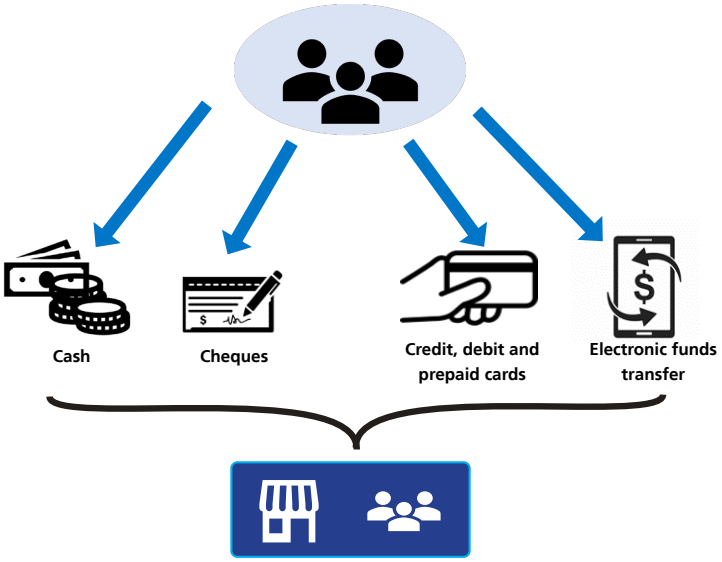
**Card payments are cleared and settled in financial market infrastructures (FMIs).** Generally, card brands have their own infrastructure for clearing transactions from the financial institutions where cardholders have their accounts to those of merchants. In some countries settlement is done with central bank money in the RTGS system, while in others they are settled through a commercial bank. The rules and standards of operation of the card brands also provide for the clearing and settlement of cross-border payments, which allows the cards to be used outside the country in which they were issued.

## DETERMINANTS OF INTEROPERABILITY IN PAYMENT SCHEMES BASED ON FUND TRANSFERS

**Traditionally, TEFs have been used for direct P2P and bundled payments (Batch).** As a means of payment, the focus of TEFs has been on making low-value payments, mainly between individuals. However, TEFs are also used to make payments from firms to individuals, such as payments to suppliers and remunerations, as well as grouped and scheduled payments (Batch). In both cases, the use of TEFs replaces cash and physical documents such as cheques and sight vouchers.

**Comparative experience shows that the transfer payment schemes can broaden payment options for individuals and firms.** The enabling of payment highways with transfers to merchants has not necessarily resulted in card payments being replaced, but has evolved as a new additional digital payment alternative, accessible to a larger and more diverse number of counterparties, individuals and companies, and in some countries it tends to supersede cash payments, at least in its initial stage (Diagram III.3).

**DIAGRAM III.3** ALTERNATIVE PAYMENT MEANS AVAILABLE




Source: BCCh.

**The P2P TEF payment schemes are generally operated by the private sector. There are a number of contractual and operational arrangements.** For example, there are jointly managed schemes between account providers and specialized entities that provide a service to financial institutions, either through a payment order communication service (i.e., switch), or through a clearing house administrator company in which account providers participate.

**However, in several countries, technological breakthroughs and public and private initiatives have made it possible to enable these schemes to make payments to merchants, in a manner comparable to that of card payment schemes.** Technological advances, such as smartphones, have created incentives to develop and incorporate account information proxies into TEF schemes, equivalent to those of cards, thus facilitating transactions. This improvement at the time of making direct payments

encourages merchants to adhere to these schemes, whose interoperability is enhanced when affiliation or acquiring networks exist (Box III.1)[7]/. In addition, in this transition towards merchant payments, in some countries the institutional arrangements of FMIs in the schemes have been moving from clearing houses or purely private arrangements to a greater involvement of regulators, both in the setting of rules or standards and through the extension of central banks' RTGS systems.

**Meanwhile, the incorporation of proxy tools that allow immediate payment origination or initiation in a homogeneous and simple manner, irrespective of the platform offered by a payment service provider, can enhance direct payments.** Proxy identifiers are alphanumeric codes or terms that are associated with deposit accounts. These can be codes, such as QR or bar codes, or aliases, i.e., telephone numbers, pseudonyms, e-mail addresses, national identification numbers, or other unique alphanumeric codes.

**The existence of a network specialized in affiliation or acquiring is another important factor in enhancing the interoperability of electronic transfer schemes for payments to merchants.** Acceptance of TEF payments at merchants with large sales volumes may require some entity to provide services similar to those described for card scheme affiliation, but not for smaller merchants, where a proxy or QR code may prove sufficient. However, independently of the size of the merchants, the safeguarding of the payment chain is as important as in card schemes, and there need to exist proportional prudential requirements in order to minimize the risks for merchants accepting this type of payments.

**Jurisdictions that have developed transfer-based payment systems, with more visible results today, have prioritized effective interoperability among the components of a Payment Scheme.** Although the international experience in the development of TEF-based schemes is relatively recent, it is possible to identify several reference jurisdictions, where high levels of interoperability between payment schemes and their components have been promoted, which has resulted in a rapid increase in digital payment usage.

**In general terms, international experience shows two strategies to achieve interoperability in TEF payment schemes.** Some jurisdictions tend to integrate some of the components of the payment schemes (mainly infrastructures, proxy databases and ancillary systems) under a centralized administration developed directly by central banks. In other words, interoperability is achieved through an integrated scheme. However, an alternative strategy is for central banks, supervisory bodies or other authorities to establish interoperability standards between components of payment schemes managed by private firms. In each of these strategies it is possible to identify different degrees of central bank involvement, which depends on factors such as market development and structure, and the powers of the respective authorities.

Below is a brief description and some examples of both strategies:

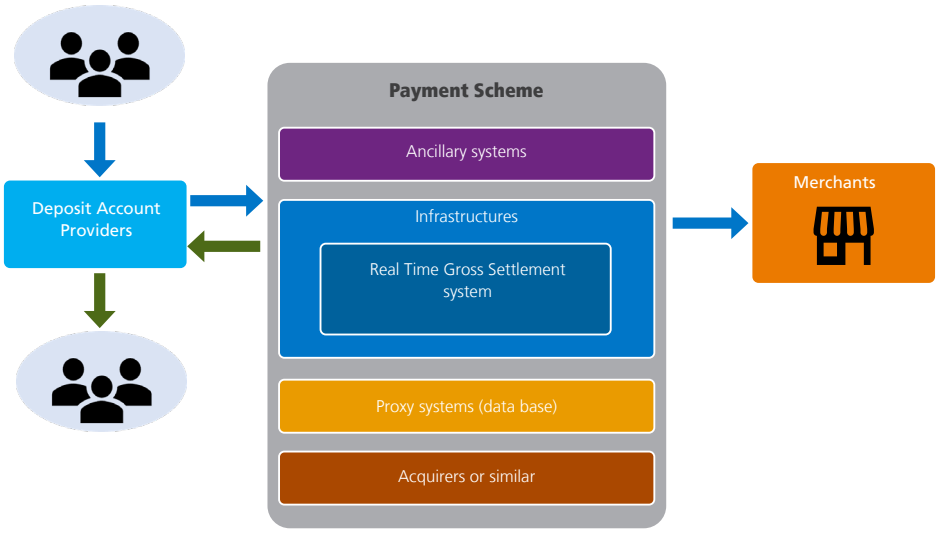
### 1.Interoperability through an integrated scheme:

**1.1 Unique, mandatory scheme for direct payments, using a high-capacity RTGS system operated by the central bank as the underlying infrastructure.** En lugar de la utilización de cámaras de compensación y otros arreglos privados, se establece una infraestructura única en la cual el banco central establece todas sus condiciones. El banco central además integra los sistemas auxiliares y, principalmente, bases de datos proxy (Diagrama III.4). Instead of using clearing houses and other private arrangements, a single infrastructure is established in which the central bank sets all its conditions. The central bank also integrates the ancillary systems and, mainly, proxy databases (Diagram III.4). In

[7]/ Payment initiators also appear to be associated with these schemes with the potential to increase payments and interoperability, by adding merchants and managing payments downstream. See Chapter III of ISiP 2023 for a discussion of payment initiators.

these cases, interoperation between components of the payment scheme is direct, since standards are established for payment instruments from different suppliers. In this sense, these are interoperable systems, in which the providers of payment instruments compete with each other through the characteristics of their applications and the attributes of their products. However, there is no interoperation or competition between different players at the level of financial infrastructures and proxy databases. One example in the application of this strategy would be Brazil, with its instant payment system, PIX[8]/, which was recently joined by Costa Rica and its National System of Electronic Payments (SINPE[9]/).

**DIAGRAM III.4** PAYMENT SCHEME WITH RETAIL REAL TIME GROSS SETTLEMENT SYSTEM

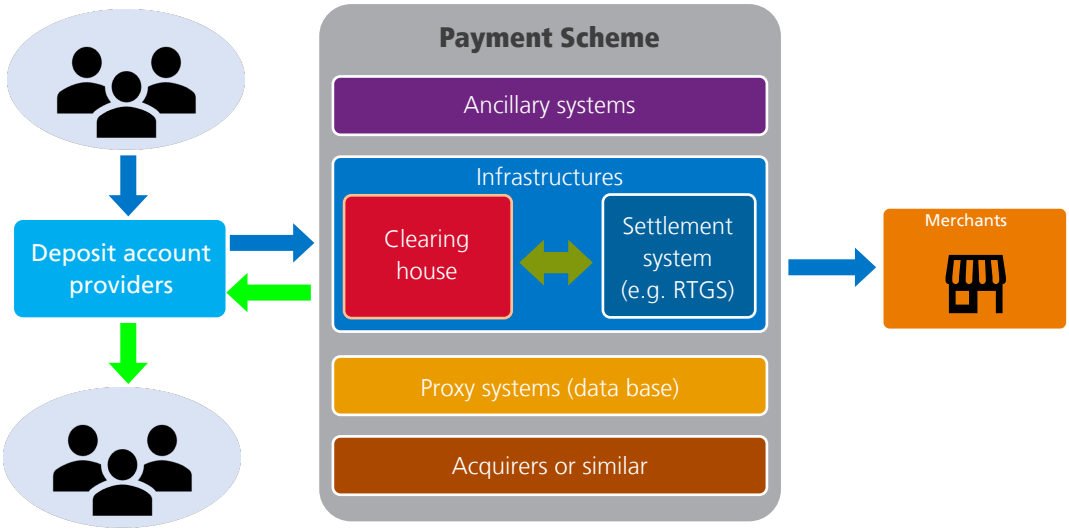



Source: BCCh.

**1.2 Single scheme for direct payments, using as infrastructure an operational arrangement in which infrastructure and other systems managed by the private sector interact with a central bank's RTGS system (not necessarily retail).** In this model, where clearing houses and other private arrangements interact with the central bank's high-value infrastructure, the costs and risks of managing the payment infrastructures underlying these schemes are jointly addressed while at the same time interoperability issues are resolved. The results obtained mirror those of the previous strategy. Prominent examples for this strategy are Australia's NPP (New Payments Platform) for retail RTGS settlement and India's UPI (Unified Payments Interface) for settlement in a high-value RTGS system (Diagram III.5).

[8]/ For further information, click here.
[9]/ For further information, click here.

**DIAGRAM III.5** PAYMENT SCHEME WITH A CLEARING HOUSE AND A REAL TIME GROSS SETTLEMENT SYSTEM




Source: BCCh.

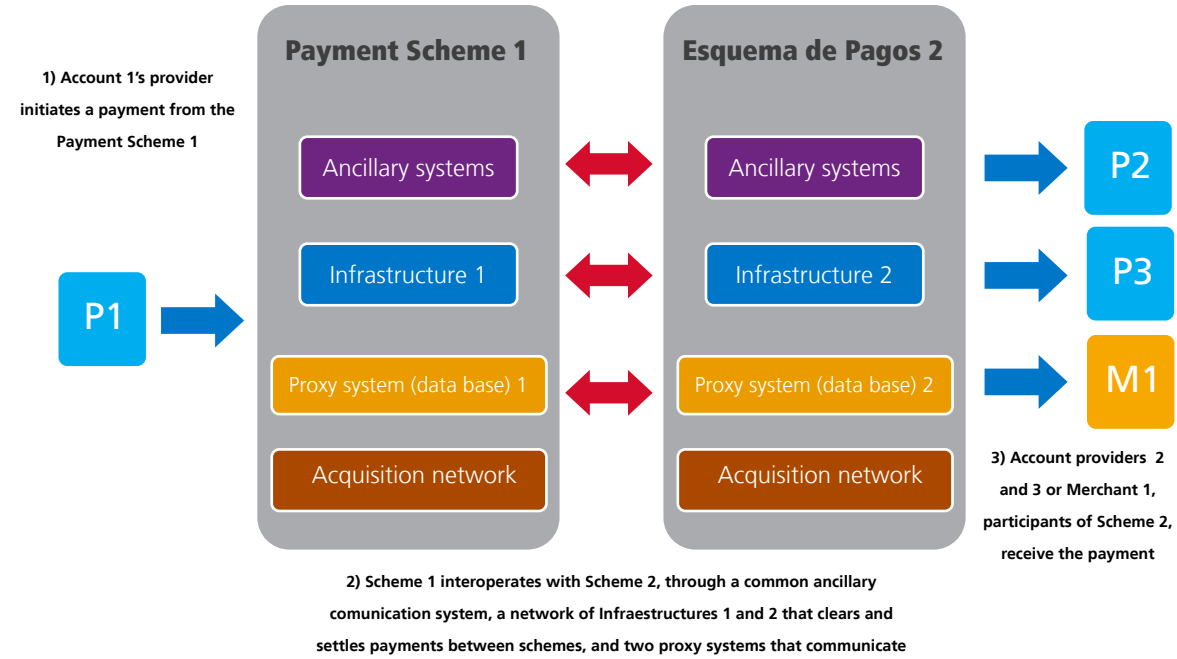
## 2.Interoperability among multiple schemes:

**2.1There is more than one scheme for direct payments in the industry, which are subject to compliance with interoperability standards in all their components.** In these cases, the private sector can develop infrastructures, such as clearing houses and ancillary systems and applications, while the role of the central bank in the operation of payment systems remains limited to high-value payments between financial institutions (Diagram III.6). These models have the advantage of keeping the responsibility for managing these systems within the industry, avoiding possible undesired effects on innovation. However, they pose more complex challenges in terms of the interoperability of the infrastructures and ancillary systems that make up each of the schemes for the definition of shared standards (Box III.2).

**Examples of these cases are Iberpay in Spain, which manages the national electronic clearing system (SNCE)[10]/, and more recently Peru, which is currently developing a project to move forward in this direction by implementing an interoperability strategy for its retail payments[11]/.** The case of Chile is also close to this model, according to the recent implementation of a clearing house for low-value TEF payments that settles in the RTGS system administered by the BCCh, as was described in Chapter II of this Report.

[10]/ For further information, click here.
[11]/ For further information, click here.

**DIAGRAM III.6** INTEROPERABILITY AMONG MULTIPLE PAYMENT SYSTEMS




Fuente: BCCh.

**2.2 Multiple direct payment schemes are allowed to develop in the industry, coexisting with a non-mandatory scheme provided by the central bank.** In the US, the Federal Reserve established the FedNow system, which has a massive RTGS system similar to the one developed by Brazil, but it is not the only payment system available, as there are private clearing houses; nor is its use mandatory for account providers. In Latin America, Colombia is developing an instant payment system similar to a clearing house, which should interact with private clearing house developments. Such strategies pose interoperability challenges between the system established by the central bank and the multiple private legacy systems.

**Although different direct payment schemes coexist in these cases, there are differences with card schemes operating in parallel.** The latter operate in a mode where each scheme has relatively homogeneous rules and standards for the different components of the Scheme. As they are managed by big international companies, they ensure in practice that most of the account providers and acquiring networks adhere at the same time to each of the currently dominant schemes. In those countries that allow the development of several schemes for direct payments, this has not been the case so far, since the schemes adhere to a fraction of the account providers and a fraction of the merchants. This explains that in the case of multiple direct payment schemes the challenges of interoperability and coordination between each of their components are more relevant, for example, for the interoperability between clearing houses explained above.

**Increasing the interoperability of payment means in the country is possible.** Throughout this chapter, the importance of interoperability has been stressed and how different schemes -both cards and TEFs- use different approaches to achieve it, which in some countries has called for the involvement of financial regulators.

**In Chile, card schemes have been operating for some years under the "4-Party Model (4PM)", which contributes to increasing interoperability.** This has allowed the entry of a large number of acquirers and sub-acquirers, which in turn has considerably expanded the number of merchants where card holders can use their cards, thus contributing to enhancing the interoperability of this means of payment.

**The transition to 4PM has not been free of difficulties which, despite having an impact on its interoperability, have been gradually resolved.** Technological interoperability should not have been a major problem when 4PM was adopted in Chile, due to the aforementioned characteristics of the card schemes. However, in the implementation of this model some frictions arose, mainly due to incentives and contractual conditions, which affected technological aspects and interoperability as a whole. For example, some merchants did not accept prepaid cards, despite accepting other types of cards from the same Scheme; some issuers had difficulties in processing their transactions through the brands' switch; and some brands have had difficulties in being incorporated in all new acquirers. By various means, including measures ordered by the competition protection authorities and supervisory actions by the supervisor, these difficulties have been corrected and at present there are no significant interoperability problems[12]/.

**Payments with TEFs, in turn, have high levels of interoperability. In recent years, TEFs have reached a very high degree of development, with an annual transaction value that currently exceeds 80% of the GDP (see Chapter I).** In practice, this is a scheme administered by the banking system, where a Retail Payments Clearing House (CPBV), which recently became a regulated entity (see Chapter II), plays a fundamental role. This scheme allows TEFs to be made to and from accounts of all banking institutions and, more recently, has also incorporated non-bank prepaid issuers. In this sense, Chile's TEF system's levels of interoperability can be considered high[13]/.

**Still, in Chile there is a gap in the development of merchant payment possibilities using TEFs.** Unlike other countries, there is no development that makes it possible to pay widely in stores using TEF, as is done with cards. There are early developments based on QR codes and/or proxies, but only users of some system providers (closed or semi-closed systems) have access to them. The development of a specialized scheme for TEF payments to merchants (P2B) would increase the availability of payment highways in the country by providing an alternative to the use of cash and card payment systems, and the payment initiators contemplated in the Fintec Law could contribute to this. This would bring benefits both for users, who would have more options for making their payments, and for merchants, who could incorporate means of payment that should be less costly and with a faster, possibly immediate, availability of funds. At an aggregate level, more efficient means of payment would be incorporated, and having an additional highway would boost the resilience of the payment system.

[12]/ See Box VI.2, Financial Stability Report, second half 2018.

[13]/ As mentioned in Chapter II, there are additional CPBV projects underway that would process TEFs. Once these new CPBVs are constituted, they could pose interoperability challenges as they incorporate a greater number of account providers to their payment schemes.

BOX III.1:

## Notable cases of diversification of digital payment services

**Worldwide, payments through card Schemes have considerably expanded their offer of digital payment services.** As a result of the proliferation of non-bank accounts and issuers (i.e. electronic money or prepaid accounts); the improvement of contactless technology, which allows cards to be paid for without having to be swiped or inserted into POS devices, including cards equipped with Near Field Communication (NFC) technology; or the dematerialization of cards, which allows them to be registered in digital wallets such as Apple Pay or Google Pay, payments by this means are increasingly widespread, fast and efficient. This has been boosted by the expansion of acquiring networks, which make it possible to reach different customers in the system (retailers and cardholders). Today it is difficult to envisage an economy with a modern payment ecosystem without a wide availability of alternatives for paying with cards.

**In addition to innovations in card payments, technological advances have been made in recent years that facilitate account-to-account (A2A) payments, particularly to businesses.** As described in this report, these innovations are increasingly allowing consumers to access their accounts through websites or smartphone applications, where they can generate and read codes (i.e. Quick Response - QR, barcodes) or passwords, or more easily record information from destination accounts linked to aliases. However, a limitation for the development of this type of service in many cases is that its availability is limited to a fraction of account providers in the market, in fragmented or closed payment Schemes, restricting its potential.

**Meanwhile, in closed payment models, some cases of widespread use in their target markets have been identified.** Prime examples are being developed in China, with Tencent's WeChat and Alibaba's Alipay. Both are payment service providers with widespread national adoption that, through an account, grant access to a virtual wallet that allows users to pay with QR codes on public transport, pay bills and make in-person and online purchases from a wide network of merchants. The ease and versatility of these products have led to a high level of adoption by consumers and businesses. Other financial services such as loans and investments have been generated through these accounts, further expanding their level of use[14]/.

**A nivel internacional existen otros casos de servicios de pagos a comercios, a través de una mayor interoperabilidad de redes proveedoras de cuentas.** LosAt an international level there are other cases of payment services to businesses, through greater interoperability of account provider networks. Account holders can use QR for direct payments to merchants in payment schemes compatible with various account issuers, integrating proxy systems into acquiring networks. The latter case occurs with the Payment Schemes of Australia (NPP), Brazil (Pix), Thailand (PromptPay), Singapore (PayNow) and India (UPI), among other countries. In those jurisdictions proxies are also used to receive payments.

**The case of Pix represents a Scheme governed by the Central Bank of Brazil and has as many QRs as proxies to initiate payments (alias or telephone).** In this case, businesses subscribe to the Pix Scheme through their accounts at financial institutions, which means that account holders can use this A2A payment method for any sale at no cost. The EFT is made directly to the merchant's

[14]/ This is so because they are Bigtechs, which amplifies their ability to evaluate customers based on their data, activities and network effects (Gambacorta, 2020; Doerr et al, 2023).

account, and the entity providing the payment service must pay a lower fee to the Central Bank of Brazil (approximately USD 0.002 for 10 transactions) to maintain the system; and merchants pay about 0.22% as a merchant discount (Duarte et al., 2022). In this way, customers who have an account affiliated with the Pix scheme pay in an interoperable way, since the account provider does not matter, as it is highly likely that they participate in Pix[15]/.

**En cuanto a aplicaciones de pago con alcance masivo en EE.UU. destacan CashApp y Venmo.** Estas As for payment applications with massive reach in the US, CashApp and Venmo stand out. These applications allow users to create rechargeable digital wallets, integrated into applications that operate as social networks. Thus, P2P and P2B payments with proxy or QR are allowed, as long as the recipient has the application installed. Merchants can digitally subscribe to these schemes and individuals can pay A2A with QR. There are also other EFT applications using digital wallets such as Wise, Revolut, Payoneer, Zelle and others that vary in interface, user experience and functionalities.

**In Chile, to pay with EFT it is necessary to enter the recipient's data manually (at least the first time), an aspect that reduces the quality of the user experience.** Leaving aside closed Schemes that allow A2A payments seamlessly with QR[16]/ or proxies[17]/ there is no mass affiliation to an EFT Scheme through an acquirer or account provider participating in this Scheme, or a system that provides a proxy or interoperable QR. However, payment initiators that affiliate merchants to enable interoperable EFTs are a type of intermediary but are not currently a mass service; and existing QRs operate in closed loops and are not interoperable. In this more practical sense, the promotion of solutions to strengthen EFT payment interoperability at merchants in Chile are prevalent public-private challenges.

**Yet, it is not only a matter of user experience that enriches A2A payment, but the technology also facilitates merchant participation in the Scheme.** Once the components of a Scheme have been established (Diagram III.1), the applications of account providers and acquirers -through commercial initiatives- can improve the experience of users and merchants at the time of paying their transactions. In general, these initiatives aim at the digitalization and fluidity of payments, with more alternatives available for merchants and greater usage incentives for payment account holders.

[15]/ Mandatory for institutions with more than 500,000 accounts, smaller entities are not required to participate.

[16]/ For example Mach from BCI, Chek from Banco Ripley, Mercado Pago.

[17]/ For example, PagoRut from BancoEstado, Paga2 from Scotia and Banco de Chile or payments to Mach's telephone contact from BCI or Tenpo.

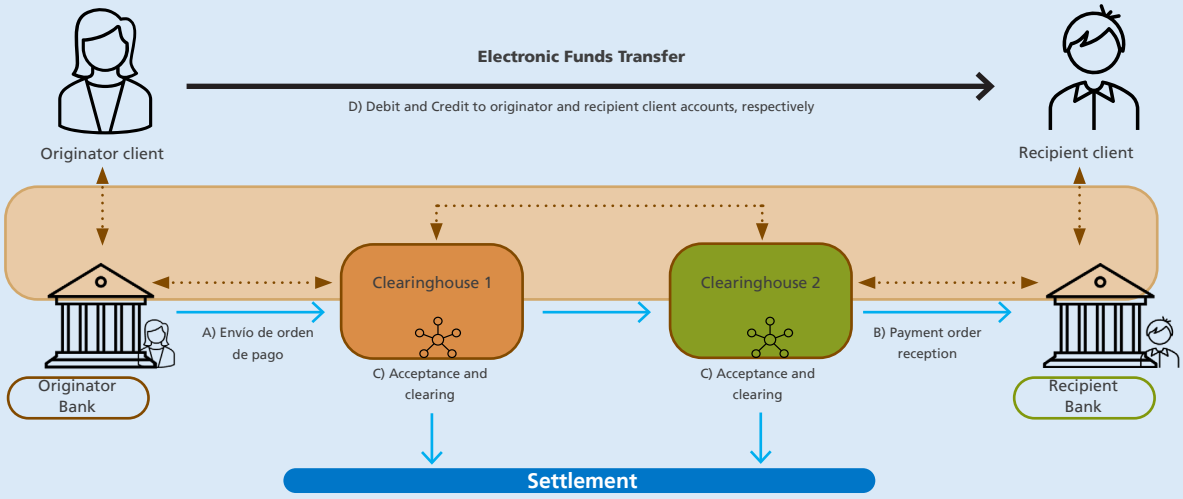
BOX III.2:

## Interoperability between schemes through their infrastructures

**Financial Market Infrastructures (FMIs) play an important role in risk management and facilitating the clearing and settlement of payment orders between financial institutions.** As has been pointed out throughout this report, local payments can be processed —that is, accepted, cleared and settled— through two types of FMI: Large-Value Payment Systems, usually a Real Time Gross Settlement (RTGS) system operated by the Central Bank; and/or through payment clearinghouses, commonly operated by the private sector, or directly by the central bank, depending the jurisdiction.

**Interoperability between electronic transfer schemes requires the underlying FMIs to be connected.** To achieve this, the clearinghouses of each Scheme must establish the conditions that payment orders and participants must meet for their payments to be reciprocally accepted and subsequently settled. Thus, to achieve interoperability between clearinghouses, coordination mechanisms or protocols are necessary to allow for confirmations and acceptances between them, before proceeding with either debiting or crediting the accounts of the participants of each clearinghouse. This mechanism must allow for the clear and exact identification of the moment when the order becomes final and irrevocable (Diagram III.7).

### DIAGRAM III.7 INTEROPERABILITY BETWEEN CLEARINGHOUSES




Note: The diagram shows an interoperability model between two clearinghouses for illustrative purposes. In it, a customer originates a payment from its account at the originating participant to another customer who has an account at the receiving participant (i). The account providers do not participate in the same clearinghouses, so for the payment to be completed, the order must first be validated by clearinghouse 1 (verifying, for example, that the order does not exceed prudential limits of the originating participant), and then routed to clearinghouse 2, which in turn must confirm whether the receiving participant is authorized to receive payment orders from the clearinghouse or whether the final account exists (ii ). Once the validity of the order has been confirmed in both clearinghouses, the order is accepted, becoming final and irrevocable, which is reflected in the debiting and crediting of the accounts involved (steps A to E).

Source: BCCh.

**Reconciling the settlement models of each Clearinghouse, which allows the extinguishing of obligations between the participants arising from the orders accepted by them, presents a challenge for interoperability.** As there is more than one settlement model, defining the exact moment at which they are extinguished becomes relevant. On the one hand, in a gross settlement model, settlement occurs at the same time as the acceptance, which means that the originating participant/debtor must have funds available at that time. On the other hand, in a deferred settlement model, the orders accumulate during a period of time (cycles), generating net obligations that must be settled at a later date.

**Coordinating the procedures for submission, acceptance, clearing, and settlement between clearinghouses requires developing guidelines that harmonize their respective requirements safeguarding their correct operation.** Thus, coordination aspects can range from requiring cross-cutting standards that may eventually become mandatory for all clearinghouses, commonly established at the regulatory level, to establishing flexible guidelines that allow clearinghouse operators to adjust to each case, complementing them with their own procedures or interoperability agreements. In both situations, it must be ensured that the clearinghouses are able to process inter-clearinghouse operations in a secure manner and in a manner that is equivalent to their intra-clearinghouse operations.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