

ESTUDIOS ECONÓMICOS ESTADÍSTICOS

The Chilean Foreign Exchange Market: An International Comparison, 1998-2019

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N.º 132 Mayo 2020
BANCO CENTRAL DE CHILE





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Estudios Económicos Estadísticos del Banco Central de Chile
Studies in Economic Statistics of the Central Bank of Chile
ISSN 0716 - 2502

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Resumen

Este trabajo presenta los resultados de la encuesta trienal de actividad de los mercados spot de tipo de cambio y de derivados negociados fuera de Bolsas (Over The Counter – OTC), la que es coordinada por el Bank for International Settlements y cuya última versión fue efectuada el año 2019 con la participación de 53 jurisdicciones. El objeto de la encuesta es contribuir a la transparencia y a la discusión internacional sobre las reformas globales que se han aplicado a los mercados de derivados OTC a nivel internacional desde el año 2008. Se observa que las transacciones de tipo de cambio en los mercados spot y derivados alcanzaron un promedio de US\$6,6 millones de millones diarios en el mes de abril de 2019 y que las operaciones con instrumentos financieros derivados constituyeron el 70% del mercado.

El documento también presenta una comparación internacional del mercado cambiario chileno respecto de tres bloques de economías, destacando su profundidad, normalizada por PIB, la que es superior a la de las economías emergentes y latinoamericanas.

Dentro de los hechos estilizados del mercado cambiario chileno, se observa el crecimiento que ha experimentado en los últimos años, con una participación importante de los No Residentes, los Fondos de Pensiones, Compañías de Seguros, Corredoras de Bolsa, Administradoras Generales de Fondos y Empresas del Sector Real, lo que está relacionado con el acceso que tienen al mercado internacional de capitales y de comercio exterior.

Por otra parte, este estudio expone las nuevas series por plazo para cada uno de los sectores financieros que ha dispuesto el Banco Central de Chile. Se concluye que alrededor del 50% de los contratos suscritos son negociados hasta 30 días, mientras que el 50% de los contratos vigentes son hasta 1 año. Finalmente, se hace referencia al trabajo que está realizando el Banco Central para disponer en Chile de una infraestructura de mercado relevante de estándar internacional, como lo es un repositorio de transacciones de derivados (Trade Repository), el que comenzará a funcionar gradualmente entre el último trimestre del 2020 y el año 2021, con los objetivos de promover la transparencia y buenas prácticas de gestión del riesgo financiero; mejorar la capacidad de toma de decisiones de los inversionistas y participantes del mercado y contribuir a los procesos de supervisión de la Comisión para el Mercado Financiero.

Abstract

This work presents the results of the triennial central bank survey of foreign exchange and over-the-counter (OTC) derivatives markets, carried out in 2019 and is coordinated by the Bank for International Settlements with the participation of 53 jurisdictions. The objective of this survey is to provide transparency and contribute to the discussion related to the global OTC derivative markets reforms since 2008. Global results from the survey indicate that trading in foreign exchange (FX) markets reached US\$6.6 trillion per day in April 2019 and that derivative contracts constituted 70% of total FX activity.

The document also presents an international comparison of the Chilean FX market with respect to three different economic blocks, highlighting its deepness after normalising for GDP, which is superior to other emerging and Latin American economies.

Stylized facts on the Chilean FX market reveal the growth this market has experienced over recent years. Active in the market are non-residents, pension funds, insurance firms, brokers, fund managers and real sector companies, whose participation is related to their access to international capital markets and commerce.

Furthermore, this study introduces new derivatives series by original maturity published by the Central Bank of Chile. These new series illustrate that around 50% of newly entered contracts have original maturities up to thirty days, whereas 50% of outstanding contracts extend out to one year. Final reference is made to work currently under way in the Central Bank of Chile regarding the development of a Trade Repository which will gradually begin operations towards the final quarter of 2020 and into 2021. The objectives of this new financial market infrastructure is to promote greater transparency and best-practice financial risk management, improve the decision making capabilities of investors and other stakeholders, and contribute to the supervisory processes of the Comisión para el Mercado Financiero in Chile.

* We thank Carmen Gloria Escobar and Paulina Rodríguez for comments. The ideas and opinions presented herein do not necessarily represent the opinions of the Central Bank of Chile or its authorities. Any errors or omissions are the exclusive responsibility of the authors. Emails: jvillena@bcentral.cl and ahynes@bcentral.cl.

INTRODUCTION

This document is an update of Villena and Salinas (2014), which presents an international comparison of the Chilean foreign exchange (FX) market, based on the results of the Triennial Central Bank Survey of Foreign Exchange and Over-the-Counter (OTC) Derivatives Markets coordinated by the Bank for International Settlements (BIS). It also discusses some stylized facts and introduces new derivatives series by original maturity for the main participants in the local derivatives market.

The global foreign exchange spot and derivatives markets are some of the most active in the world, with trading in the main international financial centers, including London, New York, Hong Kong, and Singapore. These markets have grown substantially due to globalization and multinational corporate operations, which are associated with capital flows, foreign trade financing, and financial risk management by the main participants.

A large share of these transactions is made directly with banks and other financial intermediaries, which operate outside the formal exchanges. Consequently, public information on the associated prices and amounts traded is limited and has a longer lag than data from the centralized exchanges.

In this context, the BIS conducts a triennial survey, dating back to 1986, of FX and over-the-counter (OTC) derivatives markets, in order to produce internationally comparable data on market size and structure and thus contribute to market transparency and the international debate on global OTC derivatives market reforms, such as the use of central counterparties and the creation of trade repositories (TRs) to record transactions. Chile has participated in this survey since 1998.

The document is organized as follows. The next section presents the main methodological aspects of the BIS survey. Section II discusses the results at a global level, while Section III provides a comparison of Chile in the international context, together with stylized facts on the Chilean foreign exchange market and the new series by original maturity for the different financial sectors in Chile. The final section reviews the main conclusions and future challenges.

I. METHODOLOGICAL ASPECTS OF THE TRIENNIAL SURVEY OF FOREIGN EXCHANGE AND OVER-THE-COUNTER DERIVATIVES MARKETS

Every three years since 1986, the BIS requests countries to provide information on activity in their OTC foreign exchange markets. This information is not freely available at a global level, because it involves transactions that are traded off-exchange between two counterparties. The BIS survey is the most comprehensive source on the

size and structure of these OTC markets. The data collection process is conducted in two phases. First, participating countries submit data on average daily FX transactions in their OTC markets in the month of April. Second, they report outstanding notional amounts of all FX derivatives at the end of June. The 2019 version is the twelfth survey in the series.

Central banks or other monetary authorities are responsible for compiling the data in their respective jurisdictions for submission to the BIS. The survey sample comprises the reporting dealers of each participating country.¹ In 2019, nearly 1,300 dealers participated.

The survey is subdivided into the following categories:

- Instrument: spot, forwards, FX swaps, currency swaps, OTC options, and other products, where derivatives are broken down by original maturity;
- Counterparty: reporting dealers, other financial counterparties, and non-financial counterparties, broken down into local and cross-border trading;
- Currency: 40 specific currencies and 47 currency pairs;
- Trading relationship: prime or retail brokerage, related-party trading; and
- Trading platform: direct voice, indirect voice, direct electronic, indirect electronic.

Countries also provide complementary information such as the following:

- Number of trading days in the month of April;
- Coverage and concentration of responses; and
- Activity trend in April (normal, above normal, or below normal)

The BIS publishes the preliminary results on volumes traded in September. The final report is released in December and includes data on outstanding positions.² Prior to publication, the information is always disclosed to the reporting central banks for verification and validation.

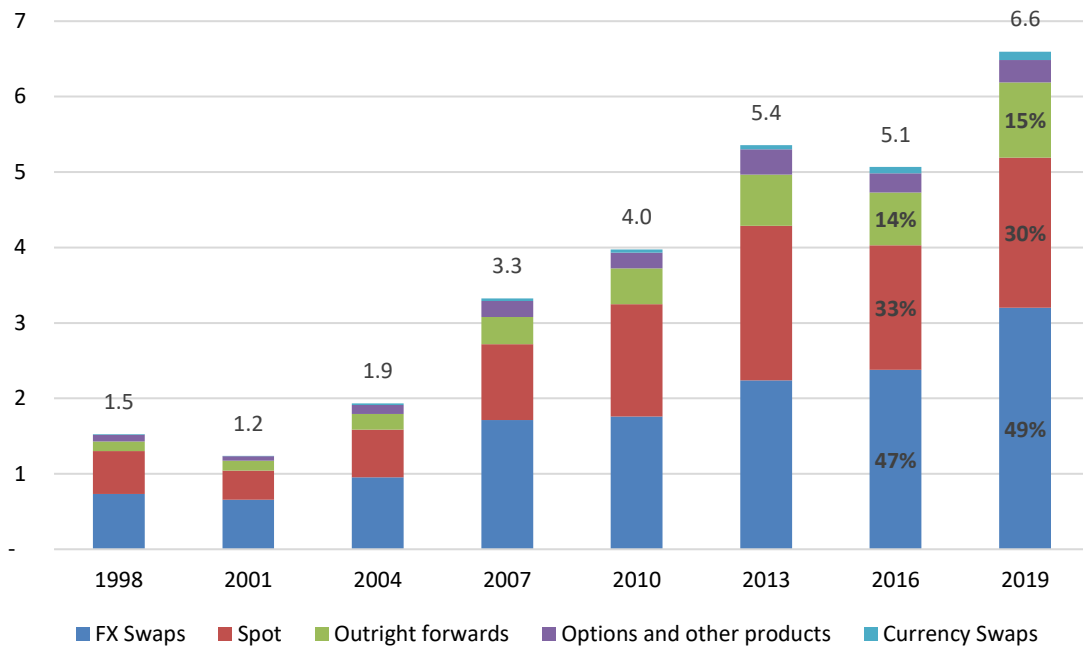
II. GLOBAL FOREIGN EXCHANGE ACTIVITY

The FX spot and derivatives markets recorded a daily average turnover of US\$6.6 trillion in April 2019, an increase of 30% over 2016. Financial derivatives contracts accounted for 70% of the market, while spot transactions represented 30%. The global increase was dominated by FX swaps (49% share), which are mainly used to manage financial liquidity and short-term currency risk hedging in US dollars (BIS, 2019) (figure 1).

¹ Commercial banks, large investment banks, and securities brokers.

² See www.bis.org/quarterlyreviews/index.htm.

Figure 1: Global FX turnover
Daily average in April
 (USD trillion)



Source: BIS.

With regard to the main markets for FX trading, that is, the countries in which the contracts are traded, the United Kingdom maintains the lead with 43.1% (2016: 36.9%), accounting for the largest market share since the start of the BIS survey; followed by the United States, with 16.5% (2016: 19.5%). Taken together, the two countries represent around 60% of the total volume traded (table 1).

Table 1: Principal FX trading markets
Daily average in April
(Percent)

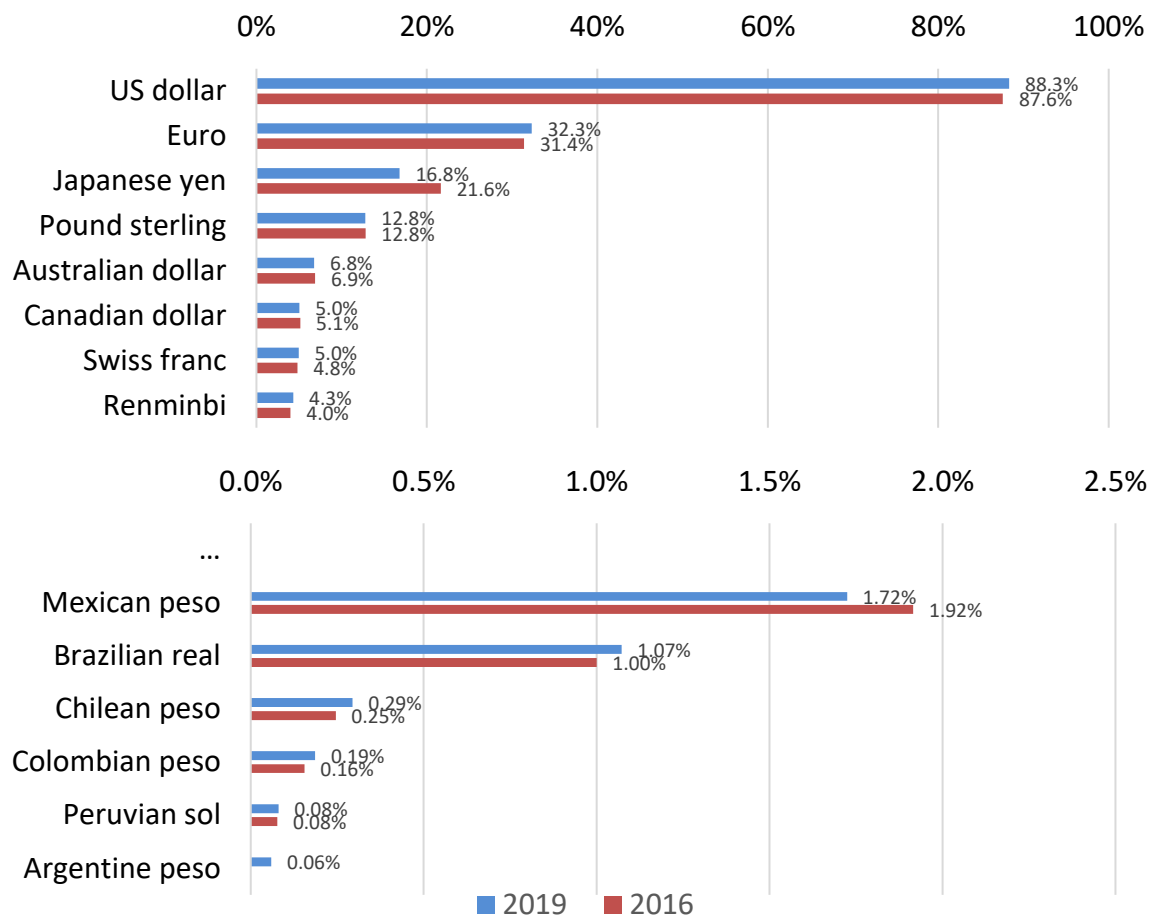
Country	1998	2001	2004	2007	2010	2013	2016	2019
United Kingdom	32.6	31.8	32.0	34.6	36.7	40.8	36.9	43.1
United States	18.3	16.0	19.1	17.4	17.9	18.9	19.5	16.5
Singapore	6.9	6.1	5.1	5.6	5.3	5.7	7.9	7.6
Hong Kong	3.8	4.0	4.1	4.2	4.7	4.1	6.7	7.6
Japan	7.0	9.0	8.0	5.8	6.2	5.6	6.1	4.5
Switzerland	4.4	4.5	3.3	5.9	4.9	3.2	2.4	3.3
France	3.7	2.9	2.6	3.0	3.0	2.8	2.8	2.0
China	0.0	-	0.0	0.2	0.4	0.7	1.1	1.6
Germany	4.7	5.4	4.6	2.4	2.2	1.7	1.8	1.5
Australia	2.3	3.2	4.1	4.1	3.8	2.7	1.9	1.4
Canada	1.8	2.6	2.3	1.5	1.2	1.0	1.3	1.3
Others	14.5	14.7	14.9	15.1	13.6	12.8	11.5	9.3
Total	100	100	100	100	100	100	100	100

Source: BIS.

In terms of traded currencies, the US dollar holds its rank in first place with 88% of total transactions, followed by the euro with 32%.³ The share of emerging market currencies increased to 25%. With regard to Latin American economies, the most-traded currencies are the Mexican peso (1.72%), the Brazilian real (1.07%), and the Chilean peso (0.29%), which is 29th in the ranking (figure 2).

³ Percentage shares sum to 200%.

Figure 2: Ranking of traded currencies
Daily average in April
 (Total share of 200%⁴)



Source: BIS.

The most-traded currency pairs in 2019 were USD/EUR (24.0%), USD/YEN (13.2%), and USD/GBP (9.6%). This reflects the fact that these currency pairs are the most commonly used for foreign trade payments and capital flows.

⁴ This is because each transaction totals 200%. For example, in a single transaction involving CLP and USD (700 CLP = 1 USD), both currencies represent an amount equivalent to the total traded (700 CLP or 1 USD).

Table 2: FX turnover by currency pair
Daily average in April
(USD billions; percent)

Currency pair	2004		2007		2010		2013		2016		2019	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
USD / EUR	541	28.0	892	26.8	1,099	27.7	1,292	24.1	1,172	23.1	1,584	24.0
USD / JPY	328	17.0	438	13.2	567	14.3	980	18.3	901	17.8	871	13.2
USD / GBP	259	13.4	384	11.6	360	9.1	473	8.8	470	9.3	630	9.6
USD / AUD	107	5.5	185	5.6	248	6.3	364	6.8	262	5.2	359	5.4
USD / CAD	77	4.0	126	3.8	182	4.6	200	3.7	218	4.3	287	4.4
USD / CNY	-	-	-	-	31	0.8	113	2.1	192	3.8	270	4.1
USD / CHF	83	4.3	151	4.5	166	4.2	184	3.4	180	3.6	228	3.5
USD / HKD	-	-	-	-	85	2.1	69	1.3	77	1.5	220	3.3
USD / Other	307	15.9	669	20.1	634	15.9	988	18.4	965	19.0	1,372	20.8
EUR / GBP	47	2.4	69	2.1	109	2.7	102	1.9	100	2.0	131	2.0
EUR / JPY	61	3.2	86	2.6	111	2.8	148	2.8	79	1.6	114	1.7
EUR / Other	74	3.8	184	5.5	233	5.9	248	4.6	240	4.7	301	4.6
JPY / AUD	-	-	-	-	24	0.6	46	0.9	31	0.6	35	0.5
JPY / Other	14	0.7	49	1.5	53	1.3	61	1.1	84	1.7	88	1.3
Other pairs	36	1.9	90	2.7	72	1.8	90	1.7	95	1.9	102	1.6
All pairs	1,934	100	3,324	100	3,973	100	5,357	100	5,066	100	6,595	100

Source: BIS.

III. THE CHILEAN FOREIGN EXCHANGE MARKET IN THE INTERNATIONAL CONTEXT

This section presents an international comparison of the Chilean FX market relative to other economic blocs in terms of depth, liquidity, financial integration, and concentration, following earlier publications.⁵

For the comparative analysis, countries are grouped into three blocs: advanced economies, emerging economies, and Latin American economies, in accordance with the International Monetary Fund's *World Economic Outlook* (appendix 2).

III.1. Depth index

This indicator measures how active a country's FX market is relative to the size of its economy. For this purpose, notional amounts traded in US dollars in April of each year are annualized based on the number of business days in the London trading calendar. GDP data are sourced from the IMF *World Economic Report* (April 2019).⁶

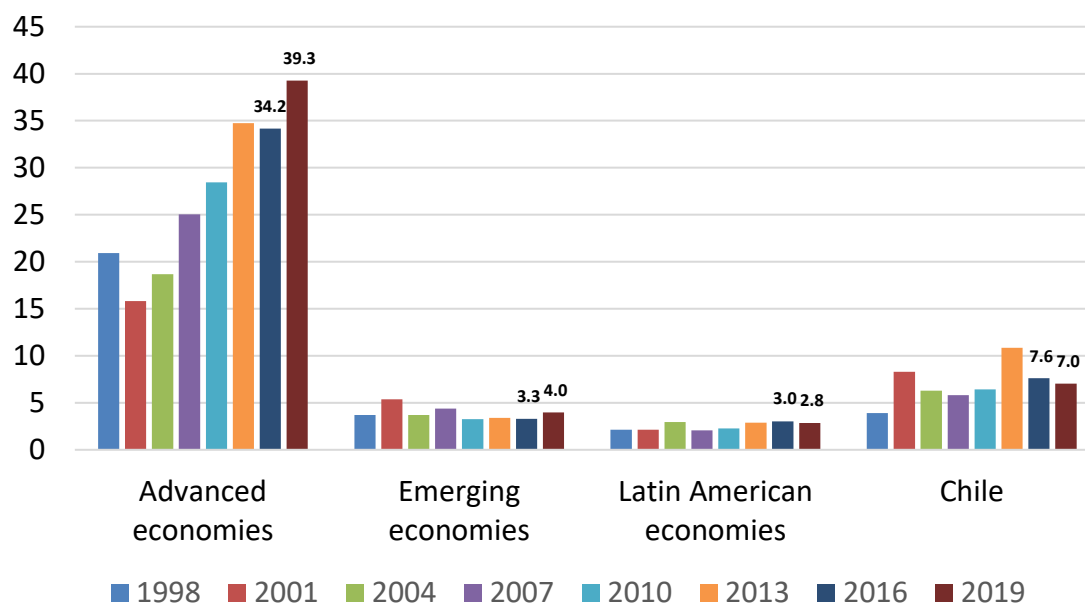
In the 1998–2019 period, advanced economies maintained the highest depth indices with respect to FX spot and derivatives turnover, with an indicator of 39.3 times GDP in 2019. This reflects the fact that these economies comprise the major international financial centers (London, New York, Singapore, Tokyo, and Hong Kong), are home to large multinational corporations, and also have the most international trade. The emerging economies have a depth index of 4.0, while the Latin American economies have an index of 2.8.

Chile has an FX market depth of 7.0 times GDP, which breaks down into 3.4 times in the spot market and 3.7 times in the FX derivatives market. This is above the average for emerging and Latin American economies. It reflects the fact that the Chilean economy is open to international trade; local companies have access to international capital markets; and there are several large Latin American multinationals with a presence in different sectors of the economy (figures 3, 4, and 5).

⁵ See Alarcón and Villena (2004), Alarcón, Selaive, and Villena (2004), Rodríguez and Villena (2009), Acharán and Villena (2011a, 2011b), and Villena and Salinas (2014).

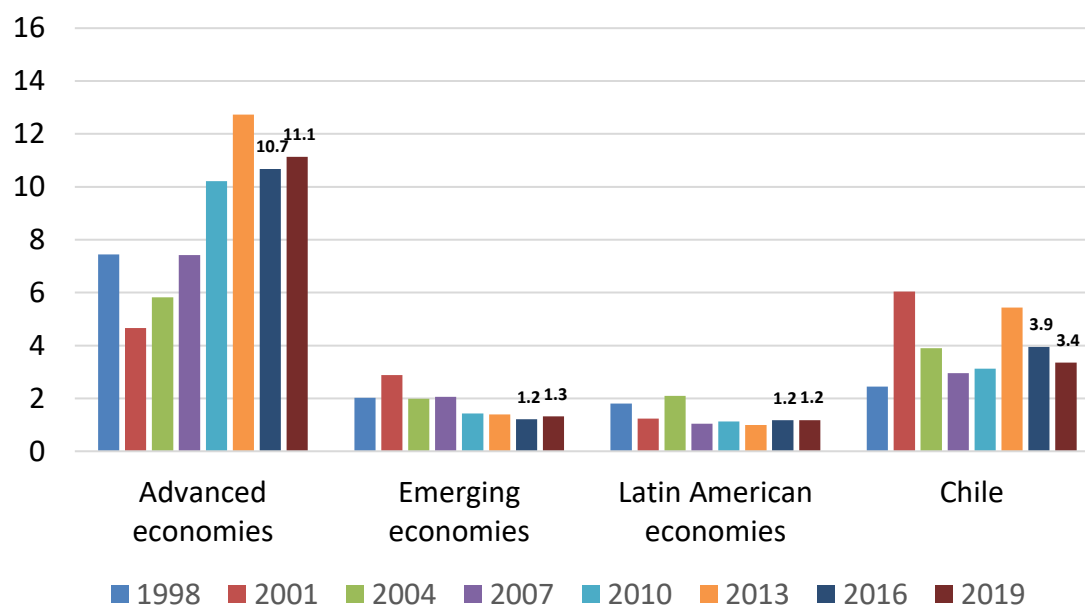
⁶ The 2019 indicators are constructed using 2018 GDP, some of which are estimates rather than real data. Appendixes 2 and 3 of this document provide further details.

Figure 3: FX market depth (spot plus FX derivatives), 1998–2019
(Annual turnover/GDP⁷)



Source: Authors' calculations, based on data from the BIS and IMF.

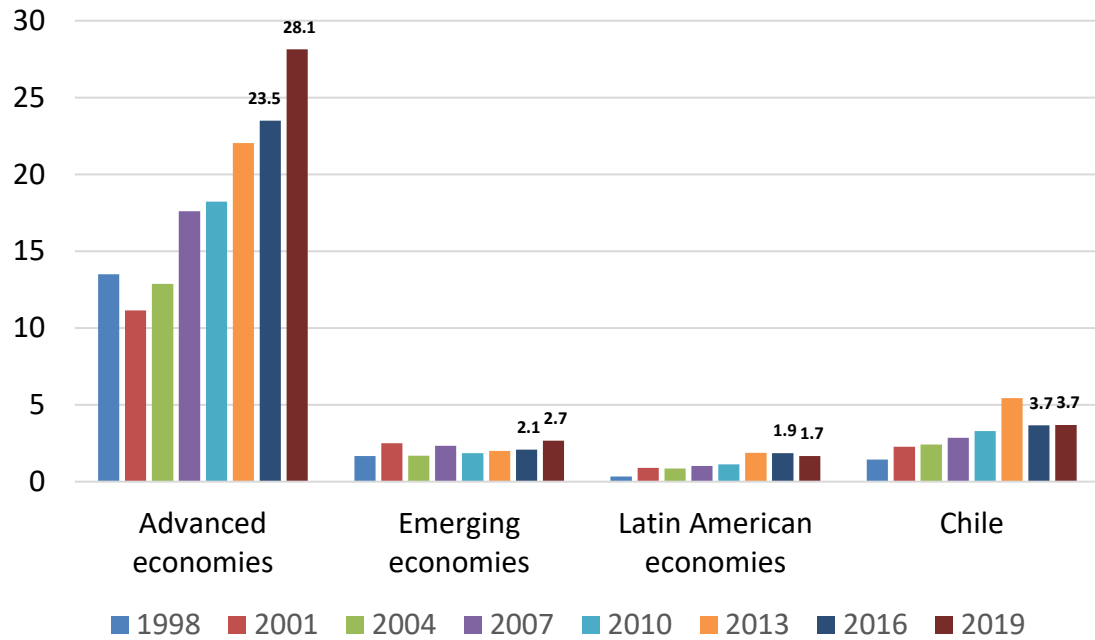
Figure 4: Spot market depth, 1998–2019
(Annual turnover/GDP)



Source: Authors' calculations, based on data from the BIS and IMF.

⁷ For figures 3, 4, and 5, see appendix 2 for an explanation of the calculation methodology; see appendix 3 for a breakdown by country. For 2019, 2018 GDP is used.

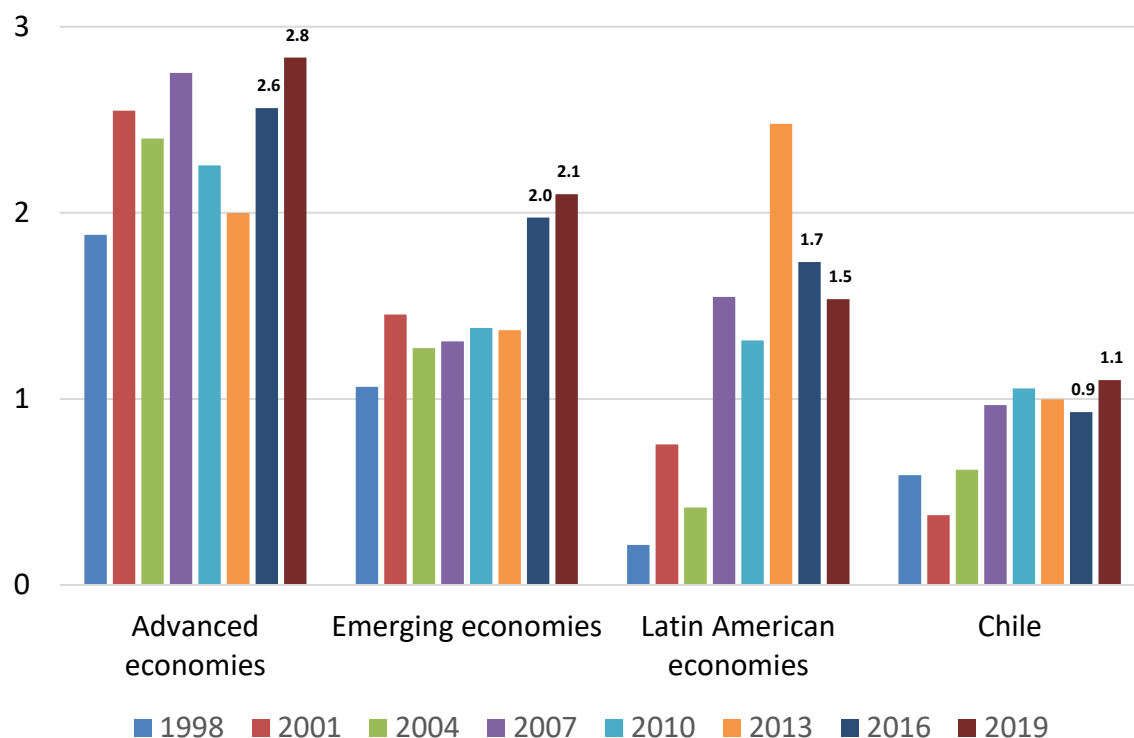
Figure 5: FX derivatives market depth, 1998–2019
(Annual turnover/GDP)



Source: Authors' calculations, based on data from the BIS and IMF.

FX turnover in the derivatives market is higher than in the spot market, with a derivative-spot ratio of 2.8 times in the advanced economies and 2.1 times in the emerging economies. In the former case, the levels were slightly higher than in 2007, before the financial crisis. In the case of Chile, the use of derivatives contracts was slightly higher than spot trading, with a ratio of 1.1 (figure 6).

Figure 6: Derivatives-spot ratio, 1998–2019
Daily average in April
 (Derivatives/spot)



Source: Authors' calculations, based on data from the BIS and IMF.

III.2 Liquidity Index

Liquidity is measured using the following index:

$$LI = \ln (AP/BP),$$

where AP is the ask (or sell) price and BP is the bid (or buy) price offered by dealers in OTC markets. The larger the bid-ask spread, the lower the liquidity.

This indicator is used to measure the liquidity of the currency being traded. In the case of exchange rates, the spread is an important part of the cost of moving capital in and out of an economy, as well as a factor in the risk management strategies of investors and hedgers. Higher liquidity implies that it is easier to sell an asset without a significant loss of value.

Below we present the weighted averages (by trading volume in the spot and 30-day forward markets in each country) of the liquidity index by economic bloc. In the case

of derivatives, 30-day forward prices were chosen because these contracts are used extensively for risk hedging in global OTC markets.

The price series were constructed using data from Bloomberg, taking the last price at the close (end) of each day.⁸ It should be noted that these prices are quotes provided to the platform by the main participants in each FX market and do not necessarily reflect actual trades.

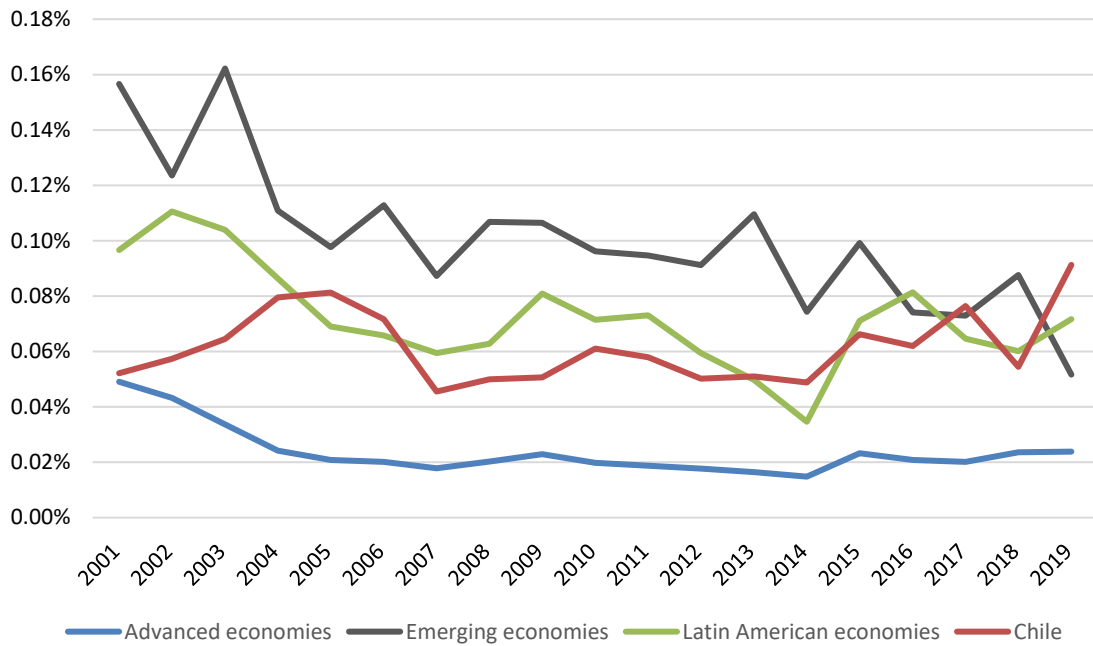
In both markets, the advanced economies have more liquidity, which is explained by the fact that they have hard currencies and are home to the dealers with the greatest buying power.

In general, economies show an upward trend in liquidity over the course of the period, probably due to the greater use of trading platforms. The one exception is the period around the international financial crisis of 2008 and 2009, when spreads increased in the emerging and Latin American economies in response to uncertainty in the markets in those years.

In the case of Chile, liquidity levels are in line with the other Latin American economies, with the exception of 2019, when social unrest triggered a significant increase in spreads starting in mid-October, which was maintained through to December 2019 (figures 7 and 8).

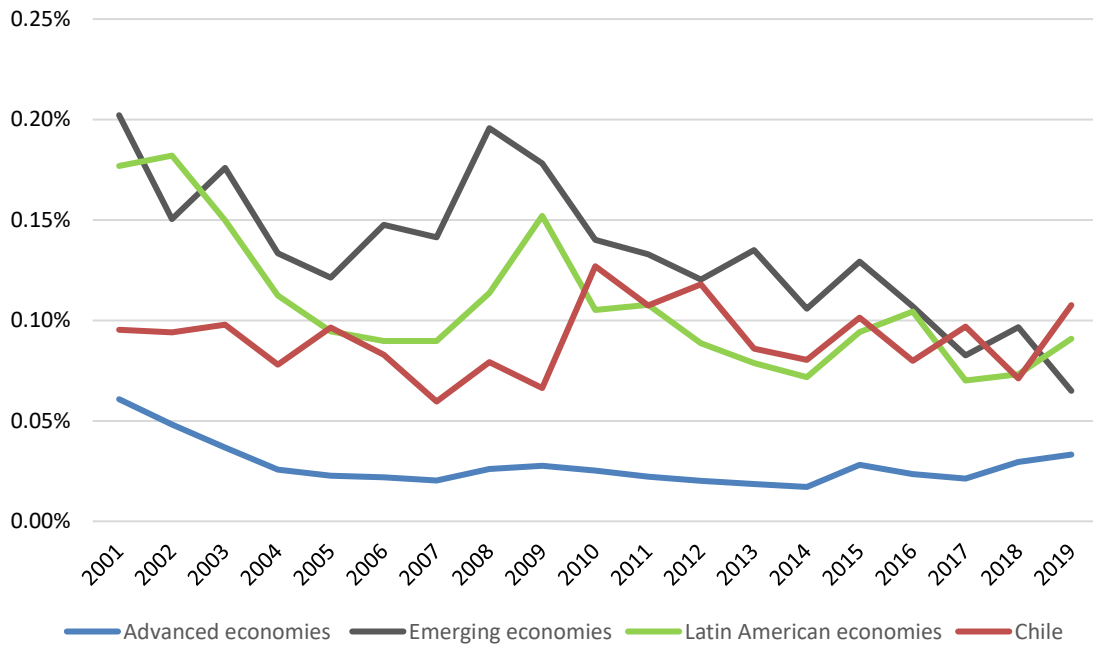
⁸ Namely, the last price at the New York close, except for Chile, which uses the Santiago close.

Figure 7: Weighted average spread of spot transactions, 2001–2019
(Percent)



Source: Authors' calculations, based on data from Bloomberg.

Figure 8: Weighted average spread of 30-day forwards, 2001–2019
(Percent)



Source: Authors' calculations, based on data from Bloomberg.

III.3. Financial Integration Index

Financial integration occurs when counterparties located in two different economies engage in trading, in what are known as cross-border transactions. This kind of trading activity reflects a country's access to international capital markets, since it requires, in the case of derivatives, an International Swaps and Derivatives Association (ISDA) contract, forward credit lines granted by the counterparties, and/or collateral arrangements. In the case of the spot market, one of the key risks is the payment or delivery of the currency (that is, settlement risk). The incorporation of a given currency in the Continuous Linked Settlement (CLS) system reduces settlement risk, thereby facilitating an increase in cross-border operations.

The derivatives financial integration index (DFII) is calculated as follows:

$$DFII = CDT / DT.$$

where CDT is the volume of cross-border derivatives transactions between resident and nonresident counterparties, and DT is the total volume of derivatives transactions, including both onshore and cross-border.

The spot financial integration index (SFII) is

$$SFII = CST / ST$$

where CST is the volume of cross-border spot transactions, and ST is the total spot turnover in a financial market, including both local and foreign counterparties.

Integration indexes are higher in the derivatives market than in the spot market, because forward contracts mostly involve hard-currency settlement and no physical delivery, whereby counterparties only have to deposit the difference between the contract price and the benchmark price, in the established currency, calculated over the notional amount. In contrast, in the spot market, the counterparties must have current accounts in both of the traded currencies, which in the case of emerging market currencies has higher costs and/or non-monetary limitations, such as the existence of financial sector regulations.

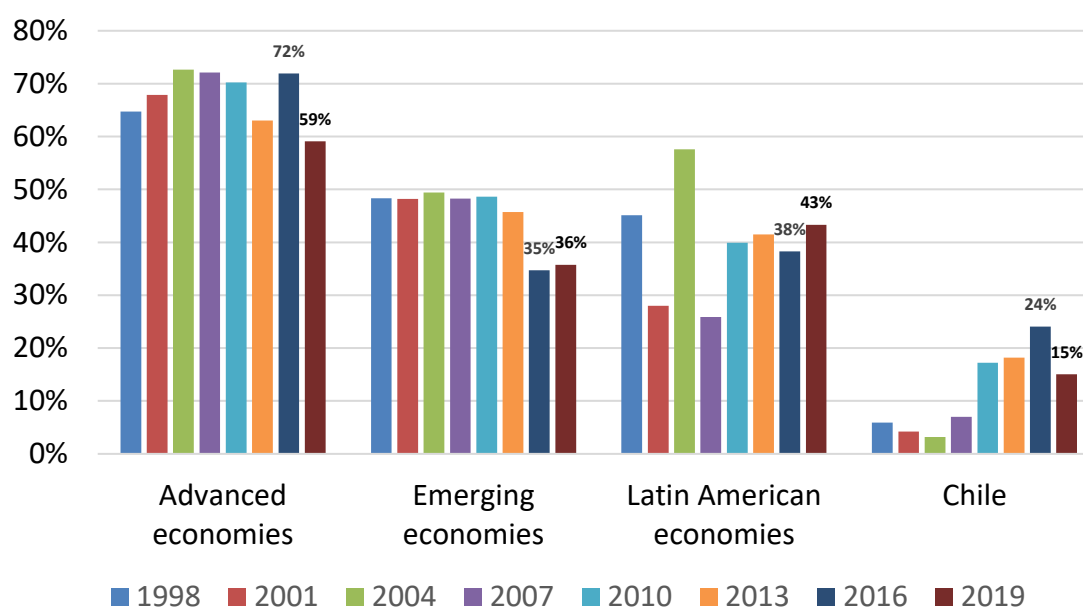
The advanced economies have the highest degree of financial integration, with an indicator of 59% and 69% in the spot and derivatives markets, respectively.

For the emerging economies, the indexes decreased between 2007 and 2019, which may reflect the implementation of new regulations in the United States (Dodd-Frank

Act⁹) and the European Union (European Market Infrastructure Regulation¹⁰) after the global financial crisis, which established higher costs for OTC transactions.

Chile has a spot indicator of just 15% and a derivatives indicator of 46%, the latter of which is very close to the emerging market average (45%). In the case of the spot market, the low level reflects the fact that there were capital controls in place through April 2001 and, subsequently, exchange restrictions on financial operations, such as the prohibition of capital contributions, loans, and investments in Chilean pesos between residents and nonresidents (figures 9 and 10).

Figure 9: Cross-border spot turnover over total spot turnover, 1998–2019
Daily average in April
(Percent)

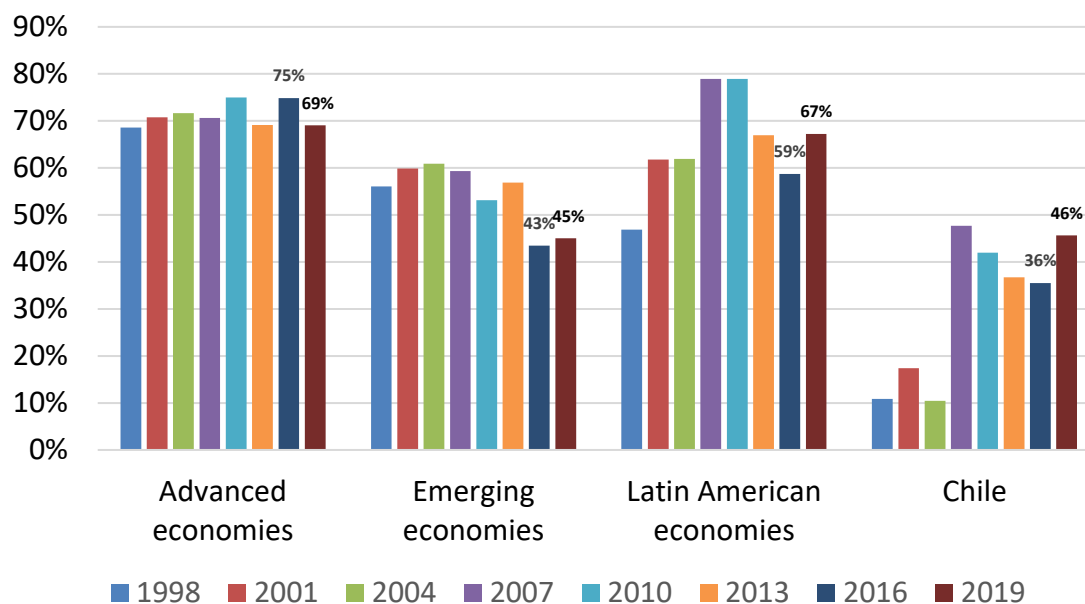


Source: Authors' calculations, based on data from the BIS.

⁹ The Dodd-Frank Act was passed in 2010 to restructure the financial regulatory system in order to restore public confidence after the 2008–09 financial crisis and to prevent additional crises in the future. A key component of this initiative was to address perceived flaws in the OTC derivatives markets and, in particular, to minimize systemic risk from OTC trading, create greater transparency, and prohibit speculative investments with customer deposits.

¹⁰ The EMIR, which entered into force in 2012, primarily aims to increase transparency in the OTC derivatives markets, in order to support the regulation and supervision of these markets by the European Union and the European Securities and Markets Authority (ESMA). A complementary objective is to reduce the number of counterparties involved in trading and lower operational risk for participants.

Figure 10: Cross-border FX derivatives turnover over total derivatives turnover, 1998–2019
Daily average in April
(Percent)



Source: Authors' calculations, based on data from the BIS.

II.4 Derivatives Market Concentration Index

Market concentration is measured using the Herfindahl-Hirschman Index (HHI), calculated as the sum of squared market shares:

$$HHI = \sum_{i=1}^N s_i^2$$

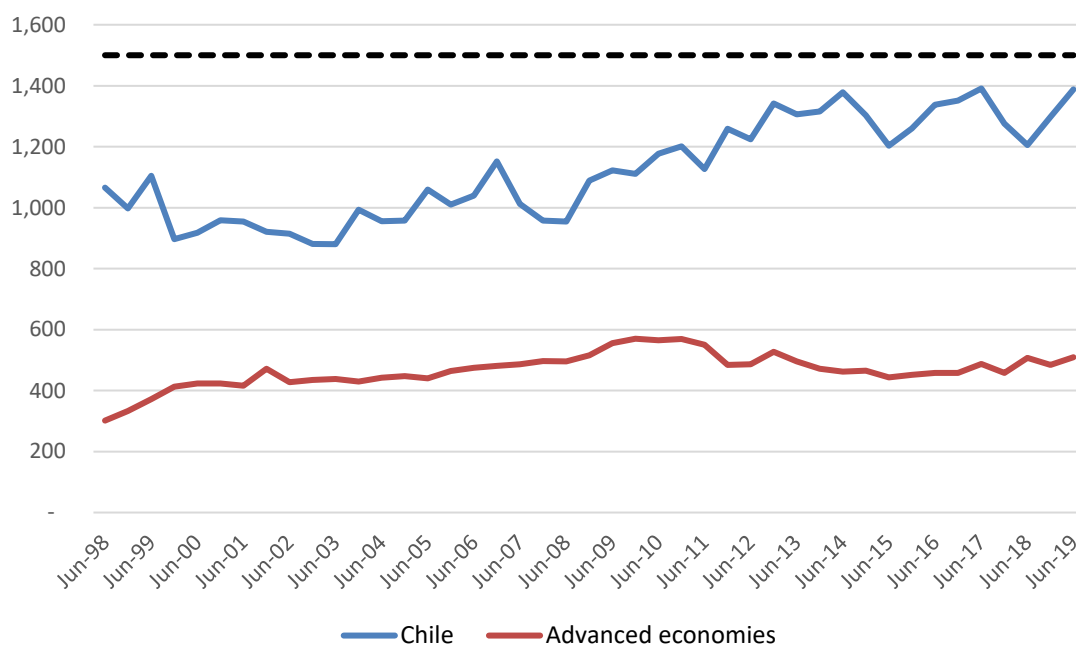
where, in the case of Chile, s_i is the percentage share of each participant or bank. For the case of extreme market concentration (that is, a monopoly), the HHI has a maximum value of 10,000. Values between 1,500 and 2,500 reflect moderate market concentration.¹¹

¹¹ According to the U.S. Department of Justice, markets with an index between 1,500 and 2,500 are moderately concentrated, while higher indexes reflect highly concentrated markets (see US Department of Justice, 2018).

The HHI is calculated for the forward, FX swap, and currency swap market in Chile and then compared with the HHI for the advanced economies, which is published biannually by the BIS.¹²

As expected, the advanced economies have lower market concentration. In the case of Chile, although the HHI is under 1,500 points, market concentration has increased in recent years due to a reduction in the number of banks in the local market, as a result of mergers, acquisitions, branch closures, and the conversion of some foreign bank subsidiaries into representative offices (figure 11).

Figure 11: Herfindahl-Hirschman Index of FX market concentration



Source: Advanced economies: BIS. Chile: Authors' calculations, based on data from the Central Bank of Chile.

¹² The following countries participate in the BIS semiannual survey: Australia, Canada, France, Germany, Italy, Japan, Netherlands, Spain, Sweden, Switzerland, United Kingdom, and United States.

IV. THE CHILEAN FOREIGN EXCHANGE MARKET

This section presents stylized facts on the evolution of the Chilean FX market since 1998. The data used are reported daily to the Central Bank of Chile by participants in the Formal Exchange Market, in accordance with chapters I and IX of the Compendium of Foreign Exchange Regulations and the associated Procedures and Forms Manual. According to the Foreign Exchange Operations Survey conducted annually by the Central Bank of Chile, the reported data account for 98% of turnover in the local market.

These data are the source of the “Monthly Report on Foreign Exchange and Derivatives Statistics” published by the Central Bank of Chile on the 23rd of each month, and are complemented with other data available in the Central Bank’s statistics database.

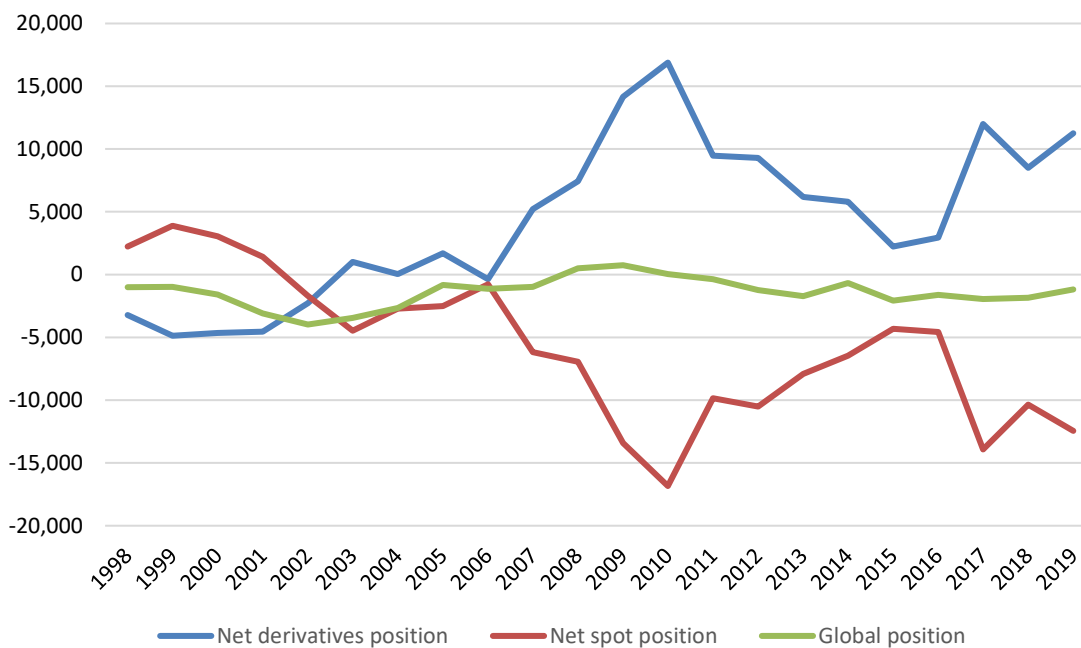
Finally, the section presents derivatives series by original maturity for the different financial market participants. These new series are being released by the Central Bank starting on the publication date of this document.

For a better understanding of the data and concepts presented in this section, see the glossary in appendix 1.

IV.1 Outstanding Positions

Banks serve as intermediaries between the FX spot and derivatives markets, as can be seen in the outstanding position in each market at each year-end (figure 12).

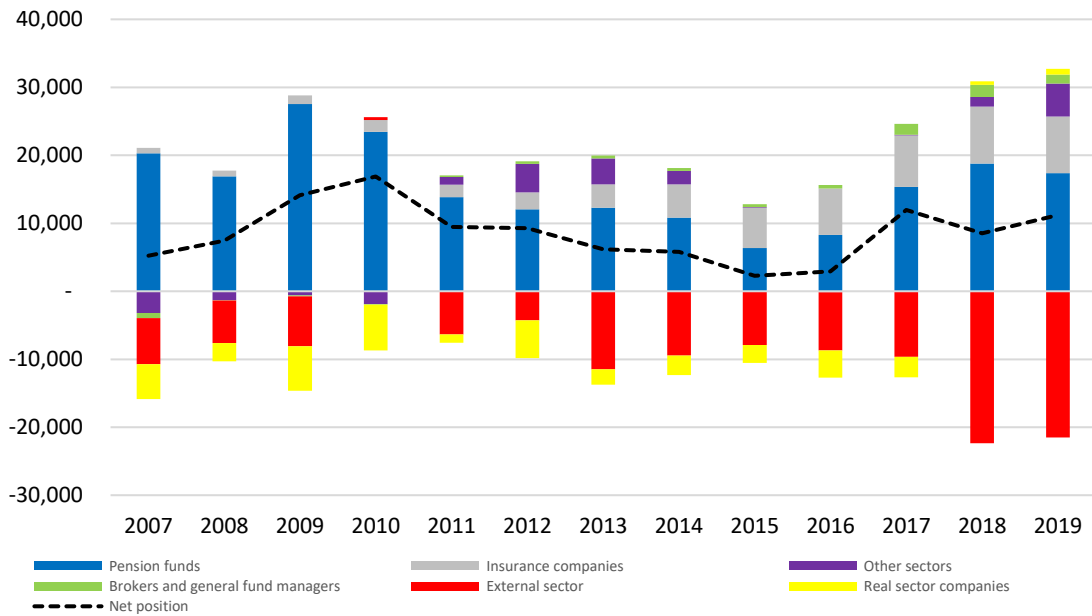
Figure 12: Net outstanding position of the FEM, 1998–2019
Spot and FX derivatives
(USD million)



Source: Central Bank of Chile.

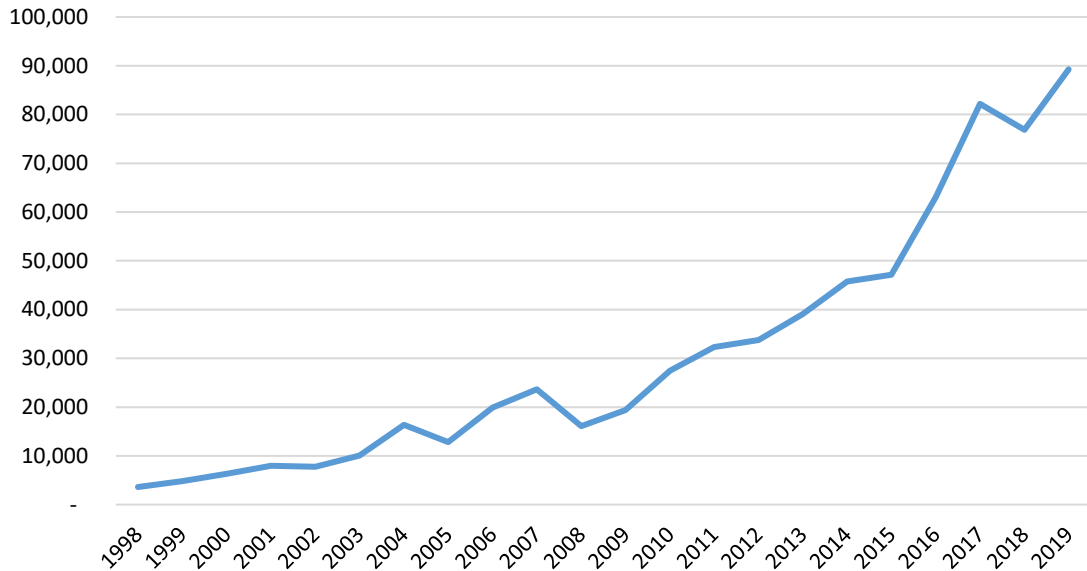
In the derivatives market, banks had a net outstanding long position of US\$11.3 billion in December 2019, where their main counterparties are institutional investors, such as the pension funds and life insurance companies, from whom they commit to buy foreign currency due the investment hedging needs of these counterparties. They hold a net short position with nonresidents, who engage in carry trades between the Chilean peso and other Latin American currencies, such as the Brazilian real and the Mexican peso, and make bets on the interest rate differential between Chile and the United States. Additionally, as a result of the greater net outstanding positions with these counterparties, the interbank open interest of CLP/Foreign currency derivatives increased more than twentyfold between 1998 and 2019, reaching US\$89.257 billion last year. This implies that the banks and regulators must establish financial management and supervision controls over an increasingly active market (figures 13 and 14).

**Figure 13: Net outstanding FX derivatives positions of the FEM, 2007–2019
by counterparty
(USD million)**



Source: Central Bank of Chile.

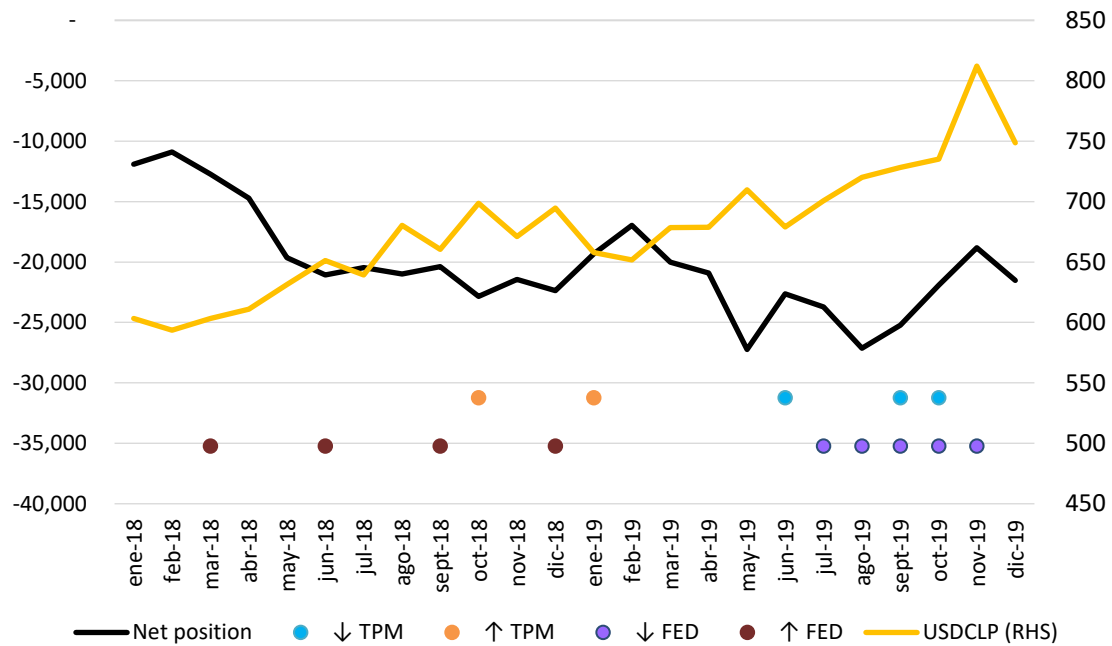
**Figure 14: Interbank FX outstanding position, 1998–2019
Interbank
(USD million)**



Source: Central Bank of Chile.

The net outstanding derivatives position with nonresidents has, for long periods of time, been correlated with the evolution of the exchange rate. For example, ceteris paribus, if foreign investors expect the Chilean peso to depreciate, then the demand for dollars will increase, depreciating the exchange rate and thereby increasing the banks' short position with these counterparties. Decoupling occurred between November and December of 2019, to the extent that the perception of increased political risk was not accompanied by a greater demand for dollars, because in that period there was also an unwinding of the carry trade relative to other Latin American economies, closing the position in dollars.

**Figure 15: Net FX derivative positions of the FEM, 2018–2019
with the foreign market
(USD million)**

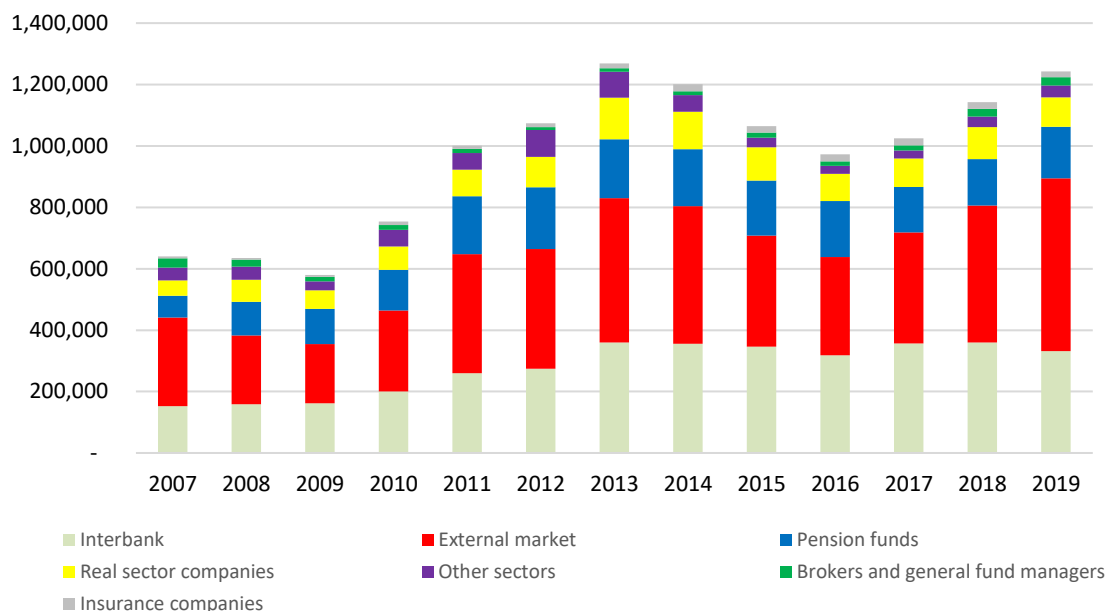


Source: Authors' calculations, based on data from the Central Bank of Chile.

IV.2. Turnover

The most active participants in the forward market are nonresidents, due to their greater short-term speculative trading, followed by interbank operations, which give depth to the market (figure 16).

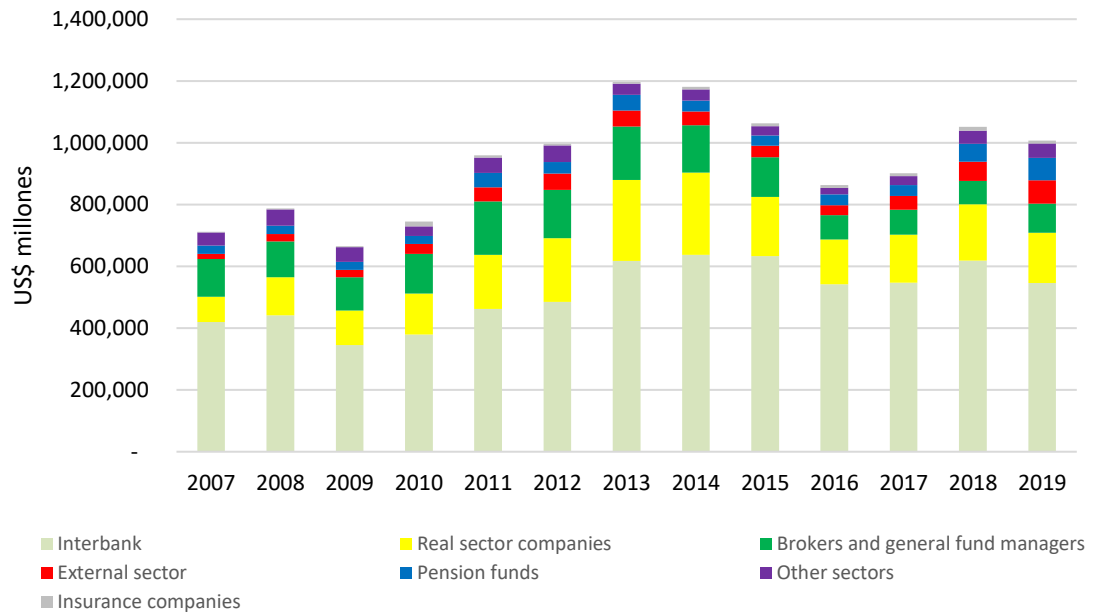
**Figure 16: FX derivatives turnover of the FEM, 2007–2019
by counterparty
(USD million)**



Source: Central Bank of Chile.

In the spot market, the most important agents are real sector companies, which buy and sell currency in relation to their foreign trading activities, their foreign currency financing through overseas loans or the issue of overseas bonds, and also the receipt of foreign investment. Note that some foreign investment is implemented through the use of physically delivered derivatives contracts, which include a recorded spot transaction on maturity. Stockbrokers, securities dealers, and general fund managers use the spot market in relation to private investors who invest in dollars. Other sectors include transactions by the Central Bank (including Central Bank spot market interventions), the Chilean Treasury, households, and other financial corporations, where the latter are mainly investment corporations that have no influence on the management of their subsidiaries. These figures include both legs of FX swap transactions (figure 17).

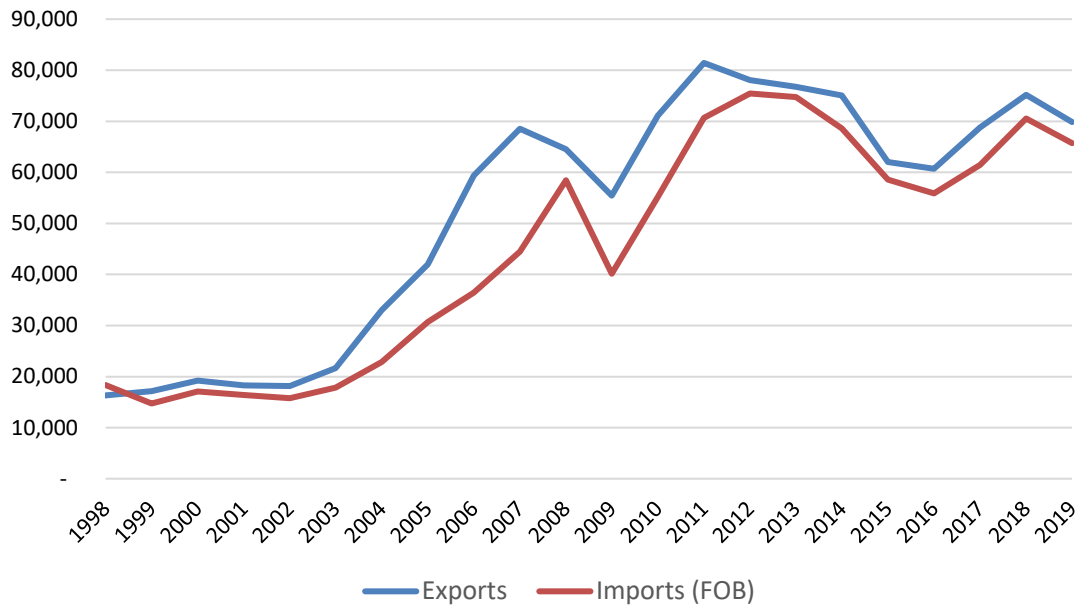
**Figure 17: Spot turnover of the FEM, 2007–2019
by counterparty
(USD million)**



Source: Central Bank of Chile.

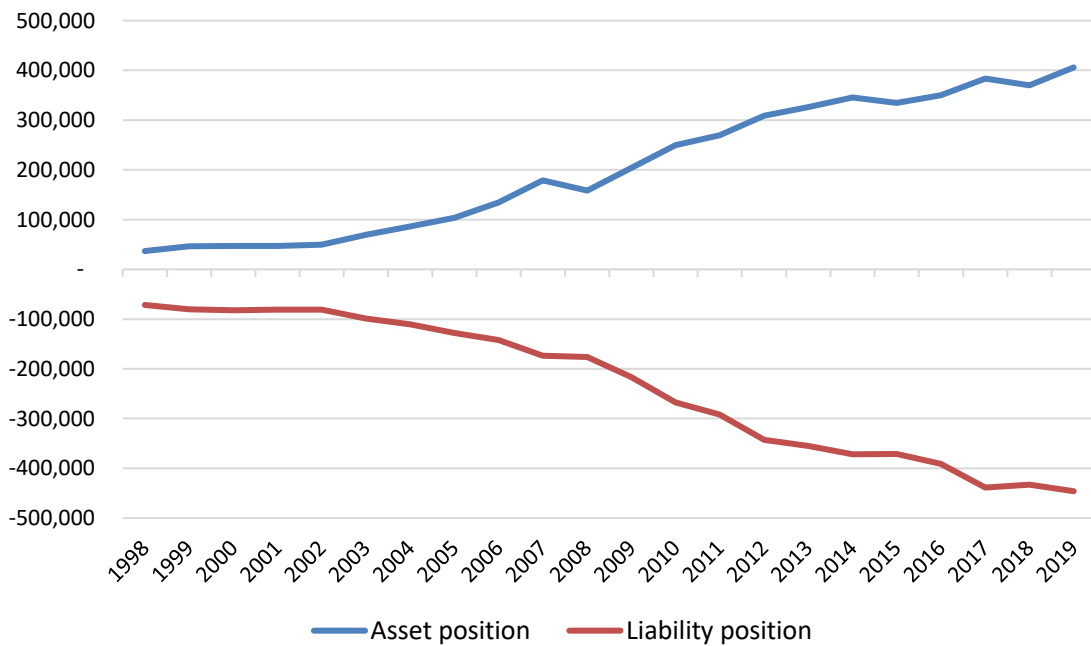
The increase in spot and derivatives trading in the last ten years is related to greater foreign trade flows. Another factor is the growth of the international investment position, which corresponds to the balance of residents' assets and liabilities with non-residents as a result of foreign investment, portfolio investment, bond issues, and foreign loans, by both institutional investors and real sector firms (figures 18 and 19).

Figure 18: Trade account, 1998–2019
(USD million)



Source: Central Bank of Chile.

Figure 19: International Investment Position, 1998–2019
(USD million)

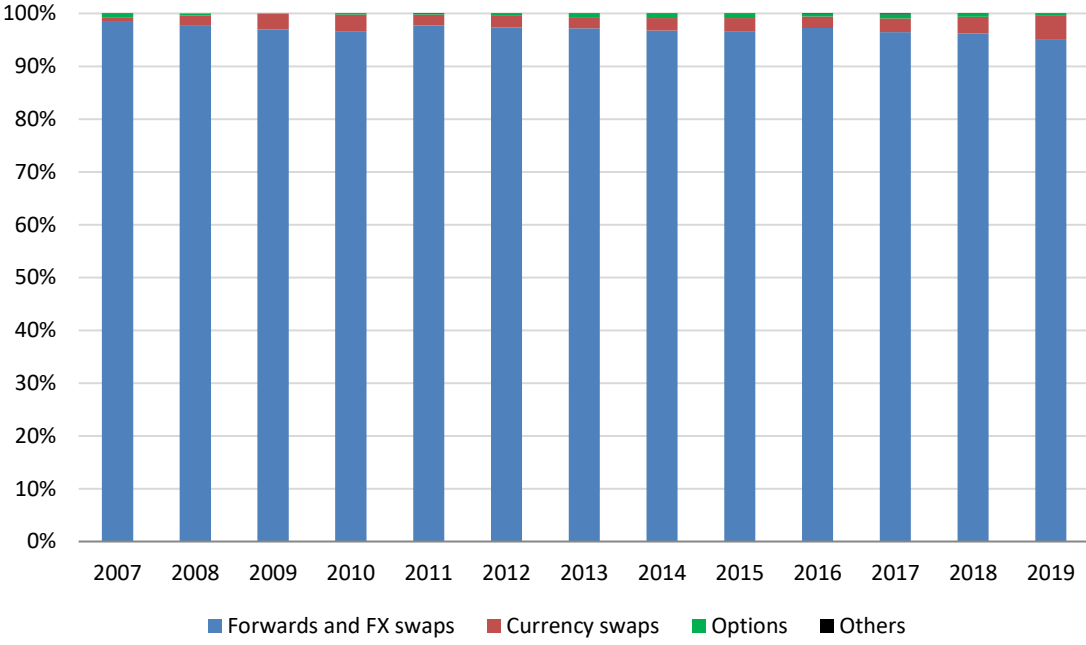


Source: Central Bank of Chile.

IV.3. Instruments and Currency Pairs

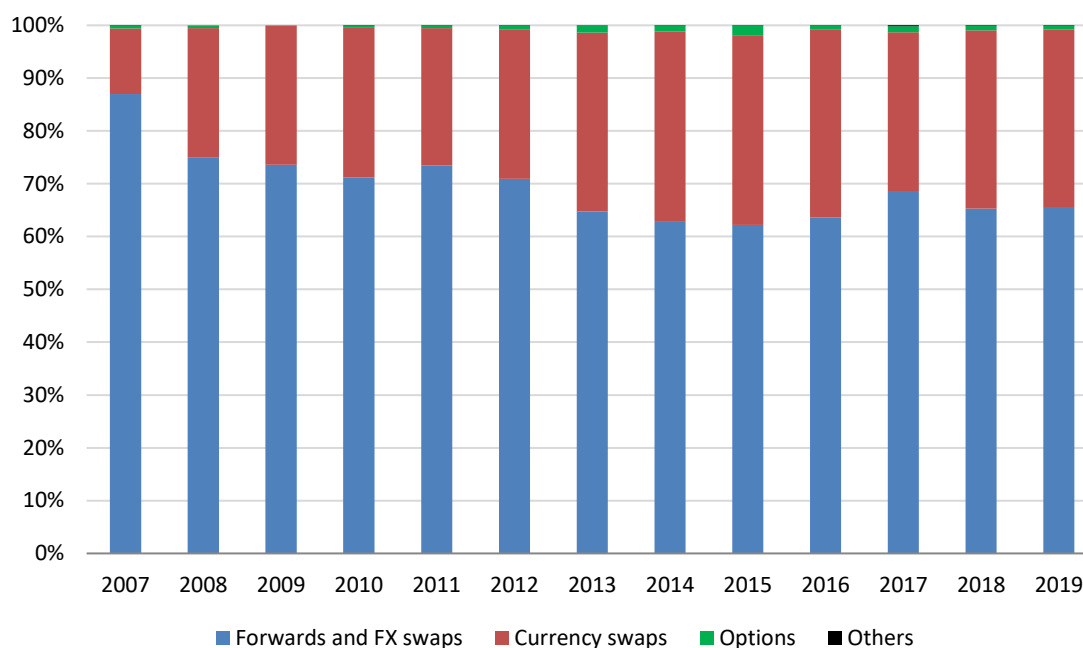
With regard to the use of financial derivatives in the Chilean FX market, forwards and FX swaps accounted for 95% of turnover in 2019, which is similar to previous years (Villena and Salinas, 2014). In the case of outstanding positions in December 2019, the share of cross-currency swaps, which are longer-term instruments associated with bond hedges, increased to 34% (figures 20 and 21).

**Figure 20. FX derivatives turnover of the FEM, 2007–2019
by instrument
(percent)**



Source: Central Bank of Chile.

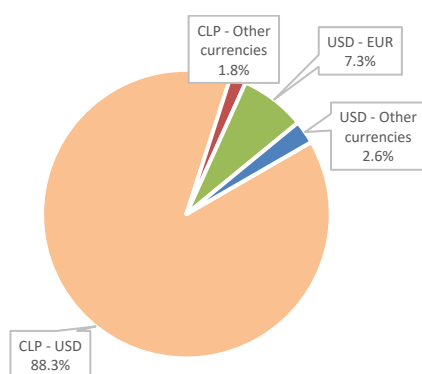
**Figure 21: Outstanding FX derivative positions of the FEM, 2007–2019
by instrument
(percent)**



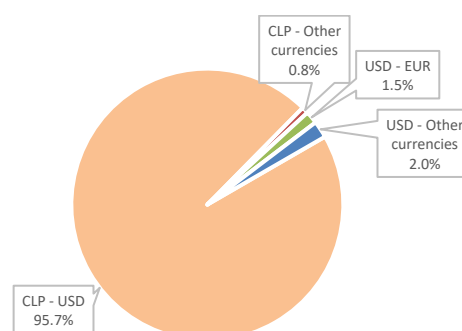
Source: Central Bank of Chile.

In terms of the currency pairs traded, the US dollar was involved in 99% of transactions on the spot and derivatives markets in 2019, continuing the trend of previous years (Villena and Salinas, 2014).

**Figure 22: Spot currency pairs,
2019
(Percent)**



**Figure 23: FX derivative currency
pairs, 2019
(Percent)**



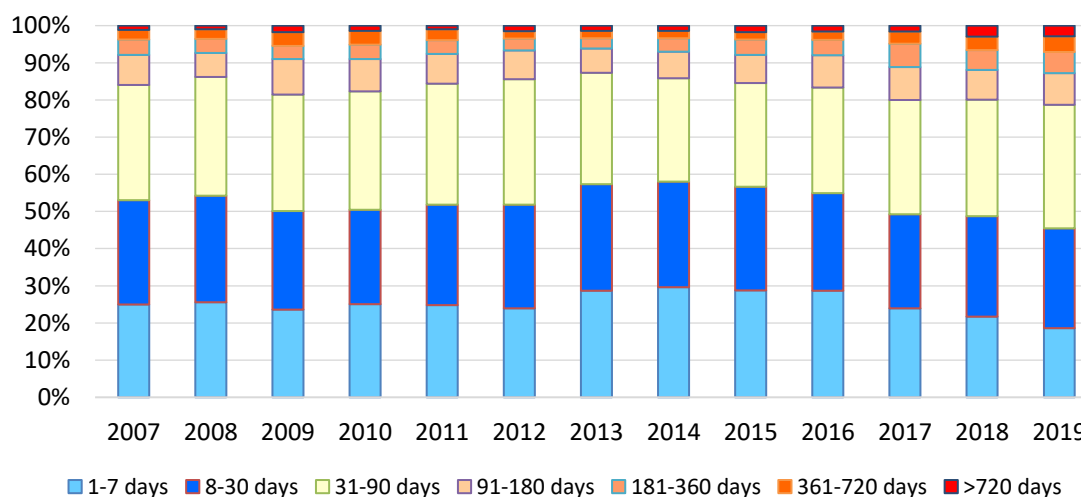
Source: Central Bank of Chile.

V. NEW DERIVATIVES SERIES BY ORIGINAL MATURITY AND FINANCIAL SECTOR

The Central Bank of Chile publishes a Monthly Report on Foreign Exchange and Derivatives Statistics, together with monthly statistics, which are available in the Statistics section of the webpage.¹³ Starting with the publication of this document, the Monthly Report will be complemented with total derivatives series by original maturity, replacing the current series, and will incorporate new maturity series for the counterparty sectors: External Sector, Pension Funds, Real Sector Firms, Insurance Companies, Stock Brokers/Securities Dealers, General Fund Managers, Other Sectors, and Interbank.¹⁴ This will provide more data for the analysis of the evolution of this market.

Typically, 50% of contracts are written for a maturity of up to 30 days, while 30% are between 30 and 90 days. The latter are associated with foreign trade operations, which normally have terms of up to 90 days, and short-term speculative trading (figure 24).

**Figure 24: FX derivatives turnover of the FEM, 2007–2019
by original maturity
(percent)**

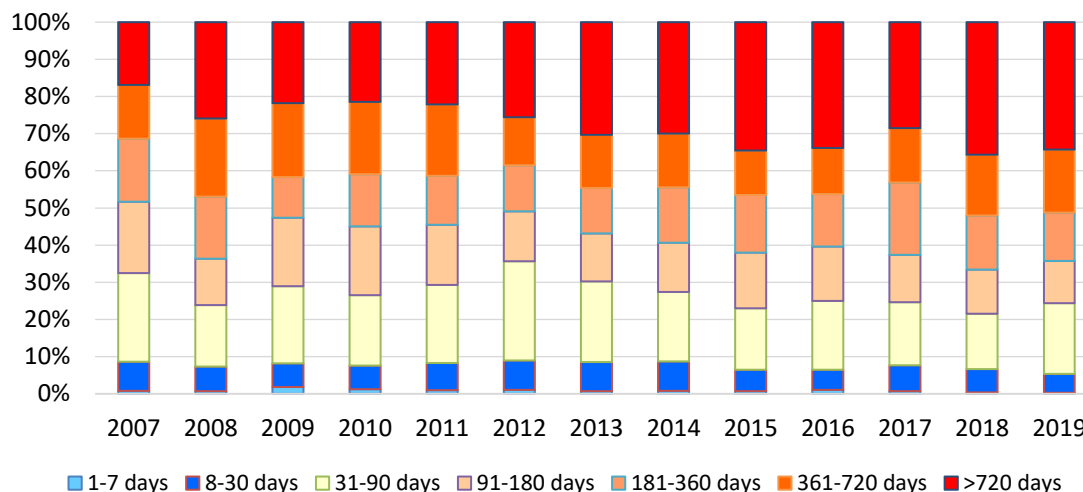


With regard to outstanding contracts at each year-end, those with original maturities of over 720 days accounted for around 30% of total outstanding. These instruments are called cross-currency swaps, which are used to hedge bonds and other long-term FX financing (figure 25).

¹³ See appendix 4 for a description of the different publication formats on the Central Bank of Chile's website.

¹⁴ For a full explanation of their characteristics and functions, see Rodríguez and Villena (2016).

**Figure 25: Outstanding FX derivative positions of the FEM, 2007–2019
by original maturity
(percent)**



V.1 Interbank

Interbank trading involves transactions carried out between participants in the Formal Exchange Market (FEM). Although both parties report the same transaction to the Central Bank of Chile, only one side is considered for statistical purposes in order to avoid double counting. Derivatives instruments include FX swaps, which are used to obtain short-term liquidity in pesos or foreign currency, where the cost (interest) is the price differential between the forward and spot transactions, or between the longer- and shorter-term forwards (figures 26 and 27).

Figure 26: FX derivatives turnover by original maturity, 2007–2019

Interbank
(percent)

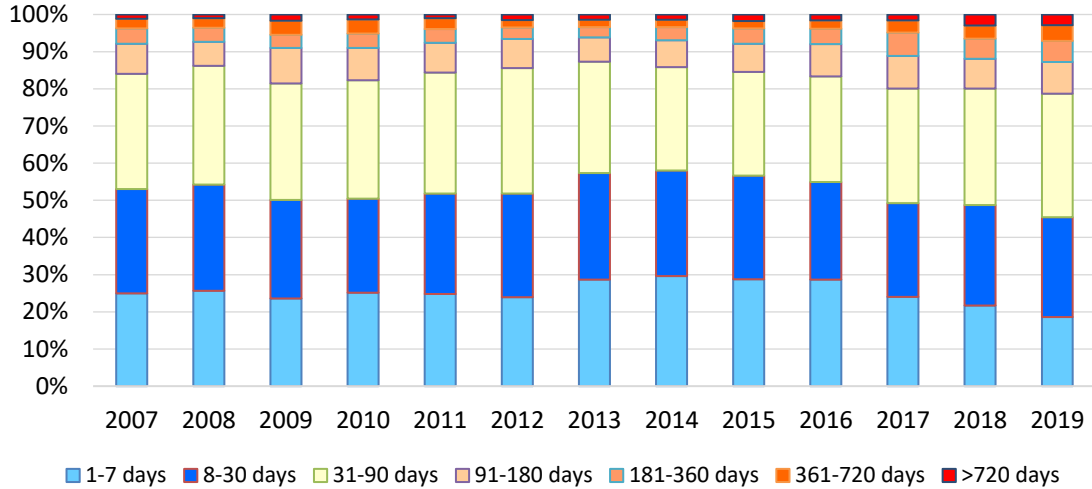
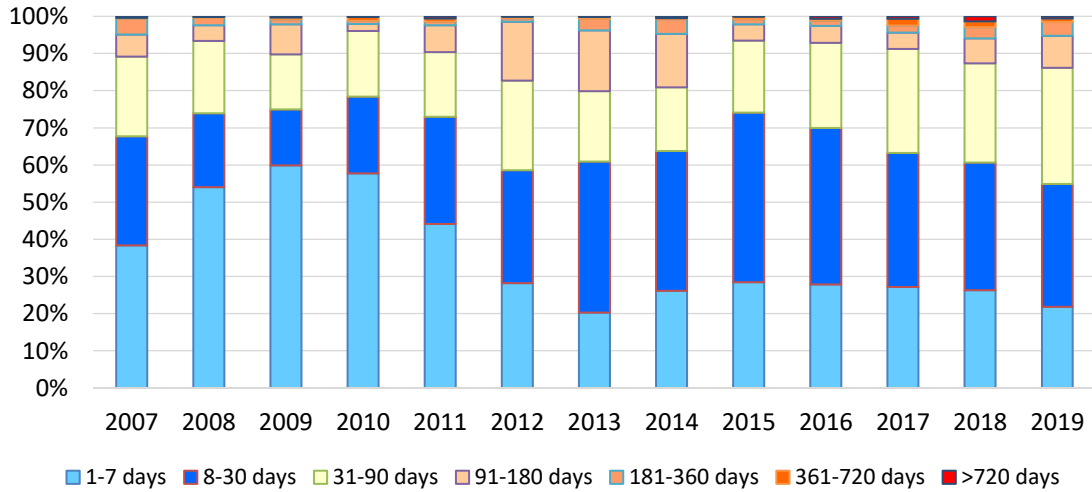


Figure 27: Outstanding FX derivative positions by original maturity, 2007–2019

Interbank
(Percent)



V.2 External Market

The external market comprises trading between residents and nonresidents. This includes transactions associated with structuring and unwinding carry trades and making bets on the evolution of the exchange rate and interest rate differentials between Chile and other countries. It also considers transactions between banks established in the country and their parent company, which carry out transactions with hedge funds and other multinationals in the international markets and subsequently record these operations in their books in Chile (figures 28 and 29).

Figure 28: FX derivatives turnover by original maturity, 2007–2019

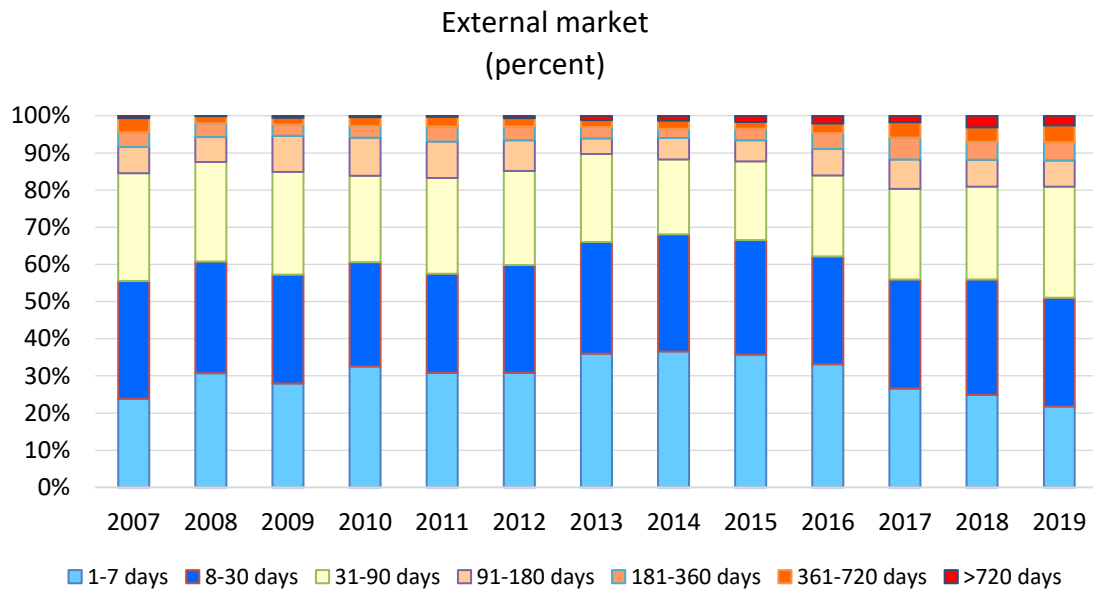
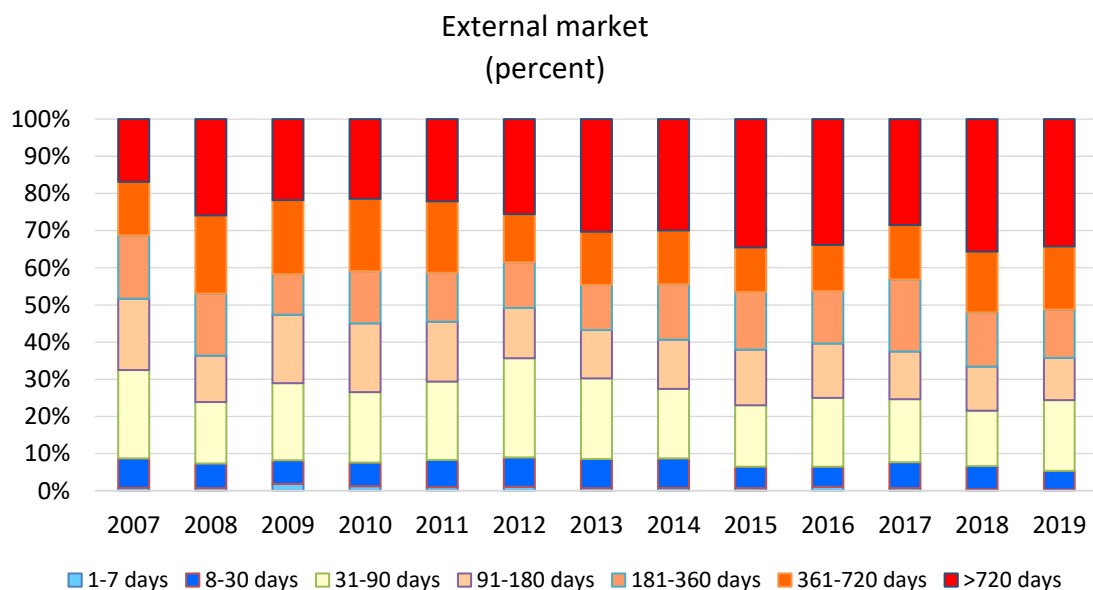


Figure 29: Outstanding FX derivative positions by original maturity, 2007–2019



V.3 Pension Funds

The pension funds are managed by Pension Fund Managers (PFMs) that are registered with the Superintendence of Pensions of Chile. These agents actively manage their derivatives portfolio in order to hedge their overseas investments. The choice of maturity is based on forward points, or the difference between the forward and spot prices. Therefore, maturities with a larger differential are used in these transactions. When they want to close out forward sales, they do so via a purchase contract for the residual maturity (figures 30 and 31).

Figure 30: FX derivatives turnover by original maturity, 2007–2019

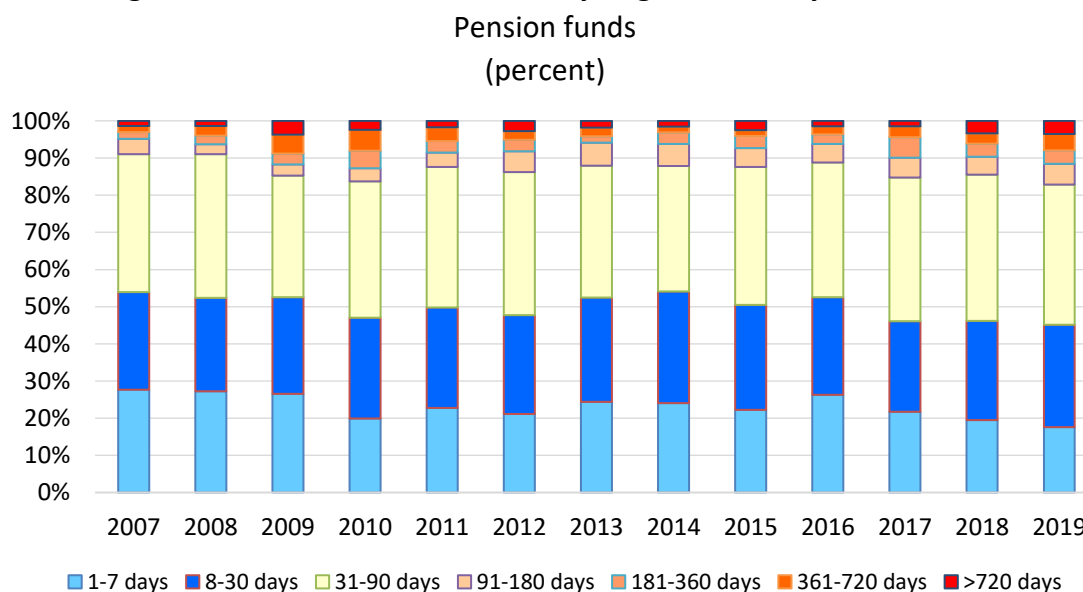
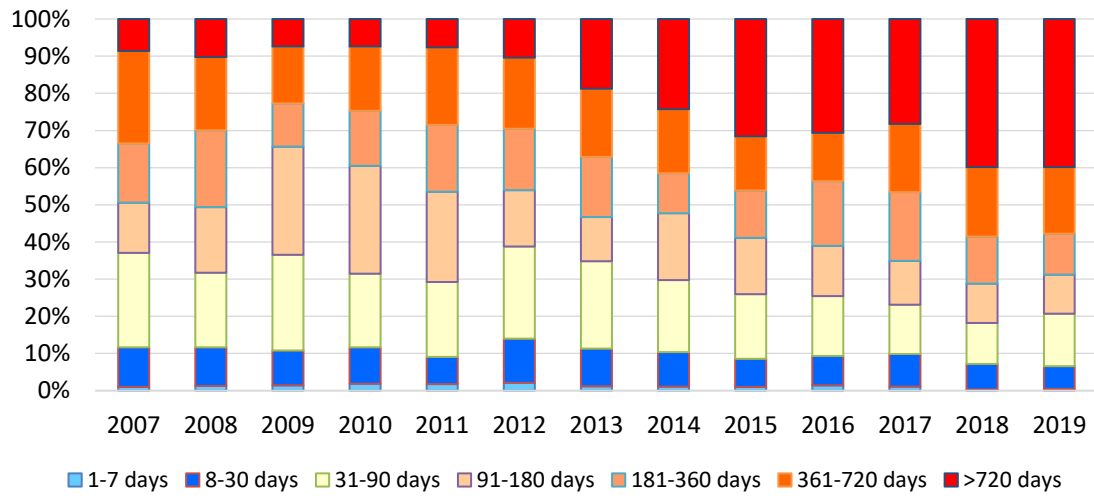


Figure 31: Outstanding FX derivative positions by original maturity, 2007–2019

Pension funds

(percent)



V.4 Real Sector Firms

Real sector firms include both public and private companies engaged in productive activities, including parent companies that participate actively in the management of their subsidiaries. Their long-term hedging aims to fix the exchange rate and interest rate for paying long-term bonds, while their short-term transactions are associated with foreign trade (figures 32 and 33).

Figure 32: FX derivatives turnover by original maturity, 2007–2019

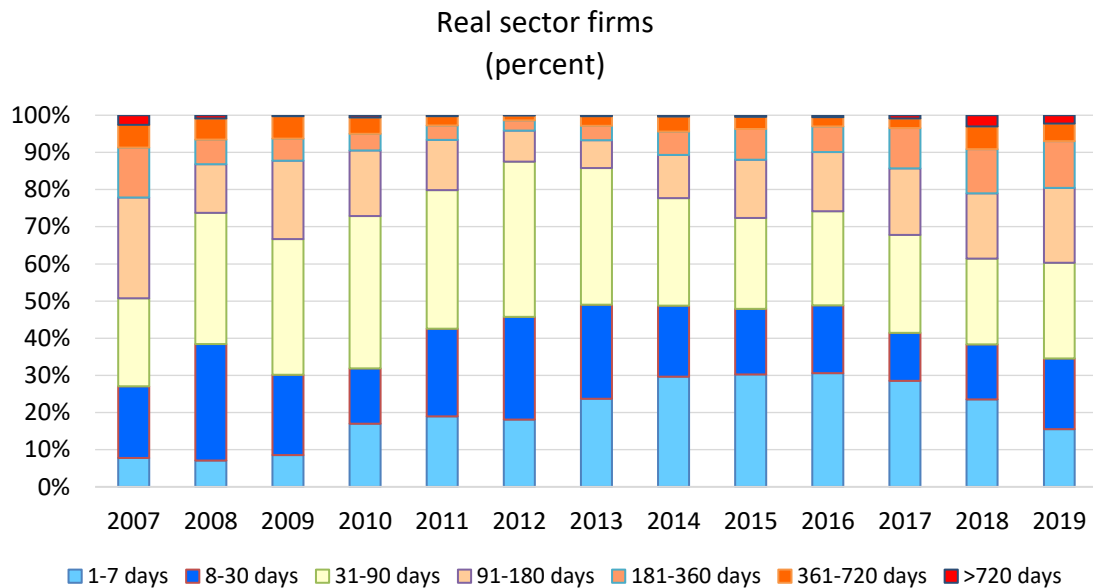
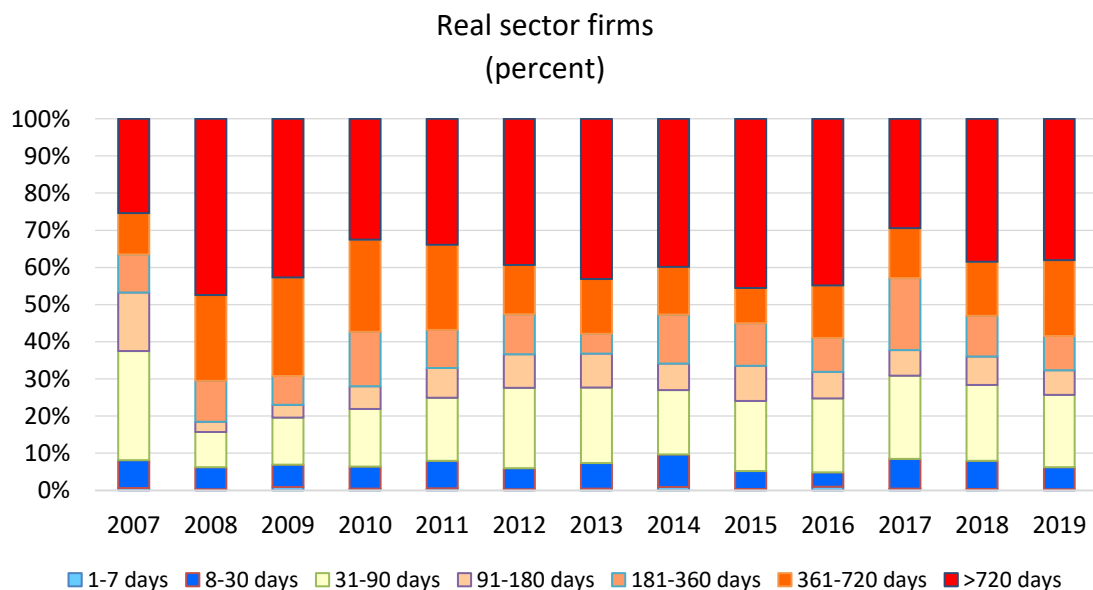


Figure 33: Outstanding FX derivative positions by original maturity, 2007–2019



V.5 Insurance Companies

This financial sector comprises general and life insurance companies that are supervised by the Chilean Financial Market Commission (FMC). In terms of outstanding maturity, around 50% of their portfolio is long term, which is associated with their overseas investment to match liabilities derived from the issue of long-term premiums (figures 34 and 35).

Figure 34: FX derivatives turnover by original maturity, 2007–2019

Insurance companies
(percent)

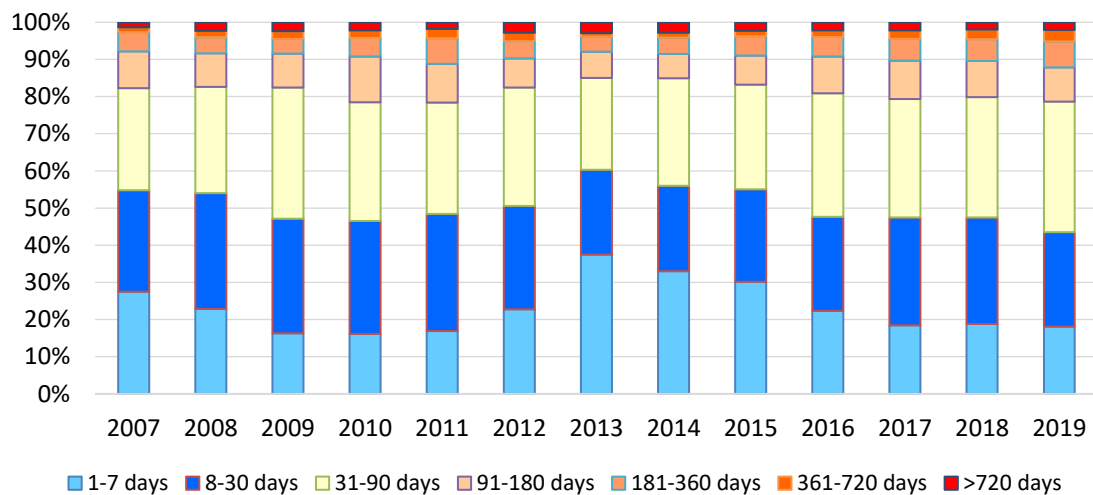
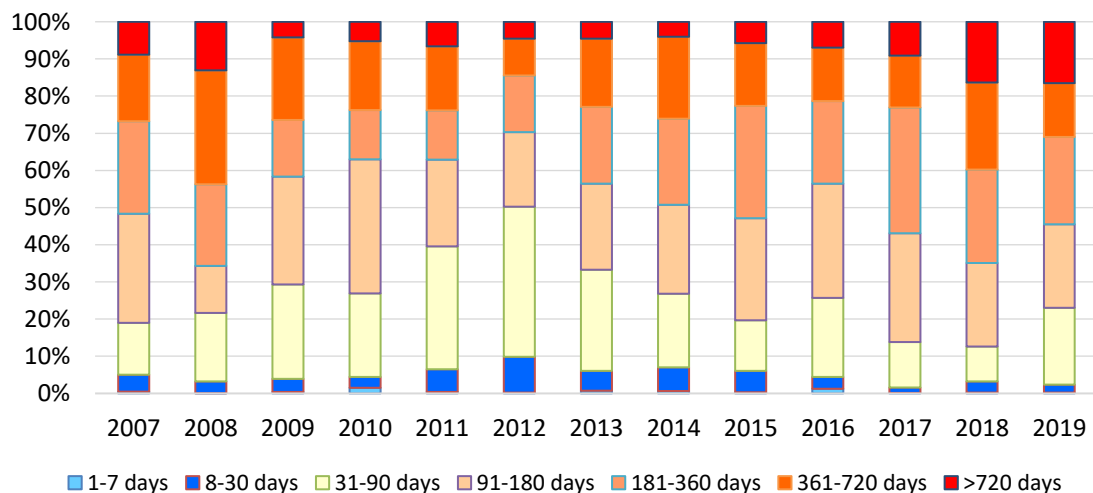


Figure 35: Outstanding FX derivative positions by original maturity, 2007–2019

Insurance companies
(percent)



V.6 Brokers and Securities Intermediaries

This group comprises FX brokers and securities dealers that are supervised by the FMC. They use short-term derivatives because their trades are oriented towards particular investors and investment funds (figures 36 and 37).

Figure 36: FX derivatives turnover by original maturity, 2007–2019
Brokers and securities intermediaries
(percent)

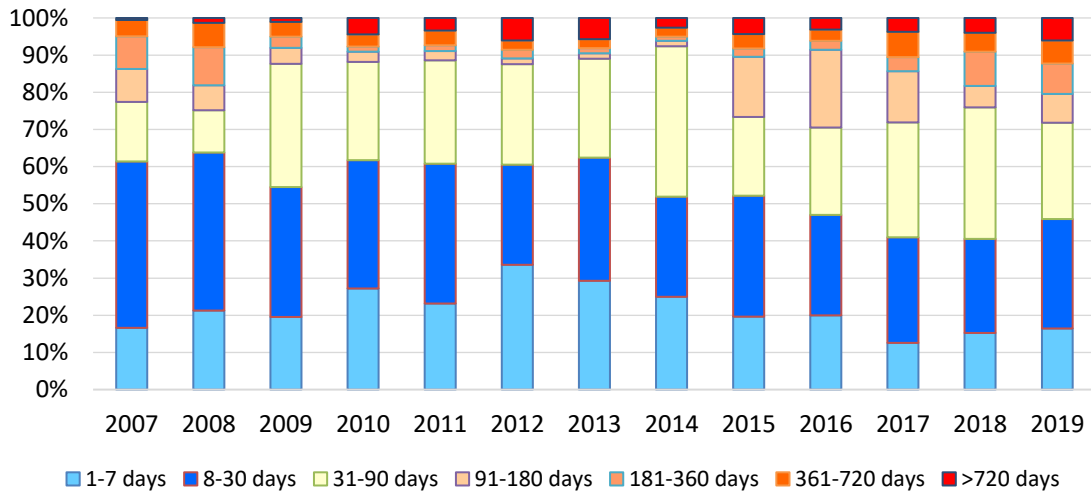
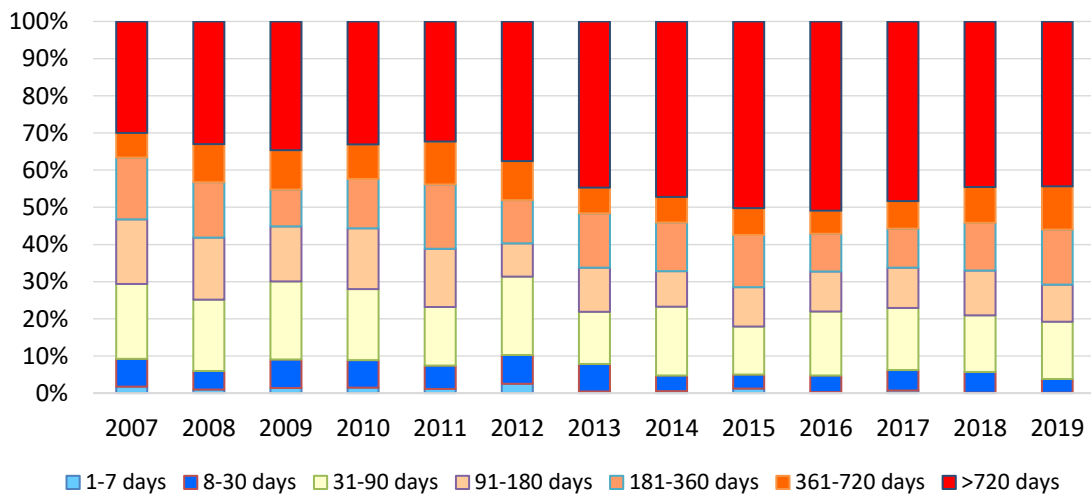


Figure 37: Outstanding FX derivative positions by original maturity, 2007–2019
Brokers and securities intermediaries
(percent)



V.7 General Fund Managers

This sector encompasses the funds managed by general fund managers (GFM) that are supervised by the FMC, some of which include foreign investment as part of their portfolio offering. They are therefore concentrated in maturities of up to 90 days (figures 38 and 39).

Figure 38: FX derivatives turnover by original maturity, 2007–2019

General fund managers
(percent)

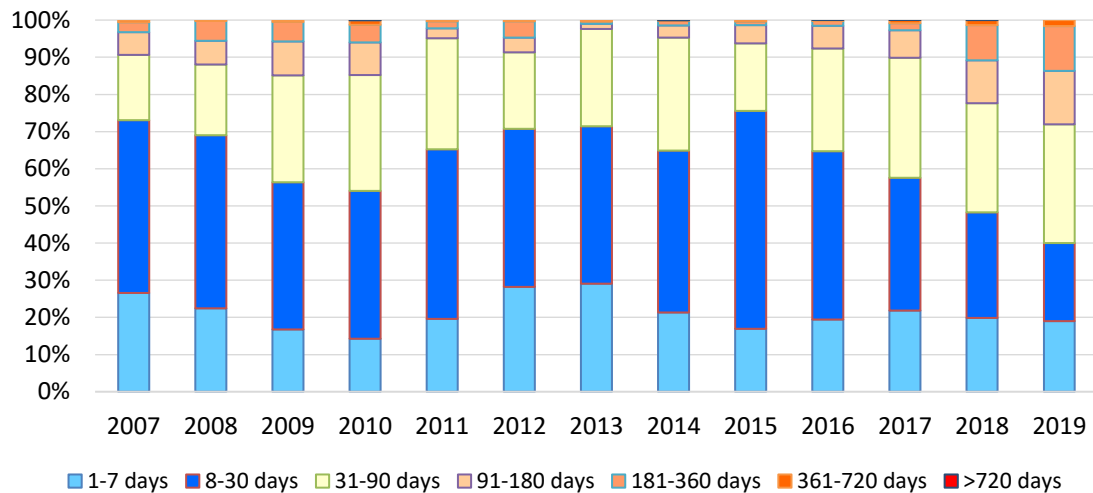
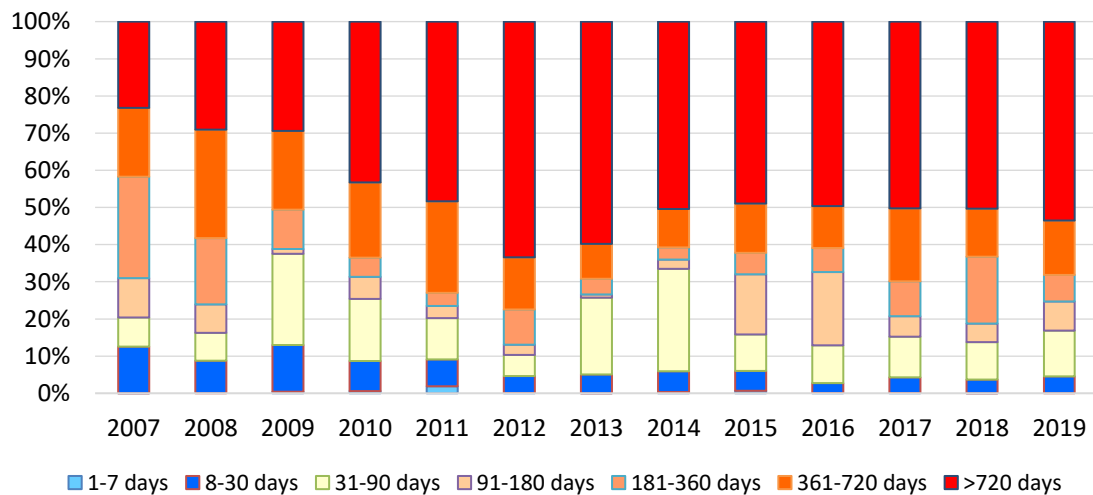


Figure 39: Outstanding FX derivative positions by original maturity, 2007–2019

General fund managers
(percent)



V.8 Other Sectors

This category includes households, the Government, the Central Bank, and other financial companies. The latter are companies that do not actively participate in the management of their subsidiaries and in some cases are established to channel investment in Chile. They are owned by multinational companies that conduct large operations, such as preferred stock offerings, which may explain the volatility observed in maturities of up to 90 days (figures 40 and 41).

Figure 40: FX derivatives turnover by original maturity, 2007–2019

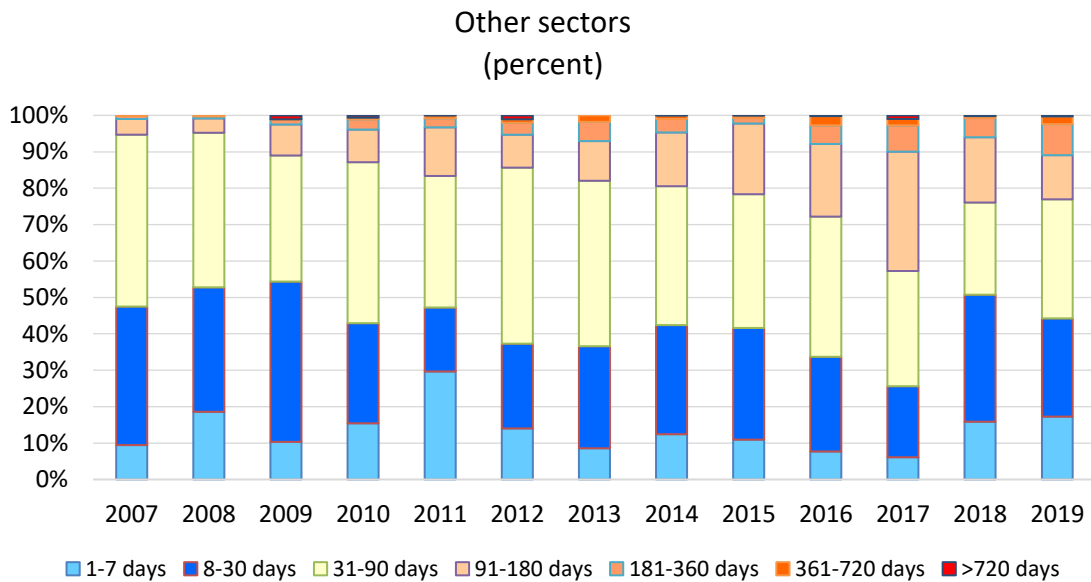
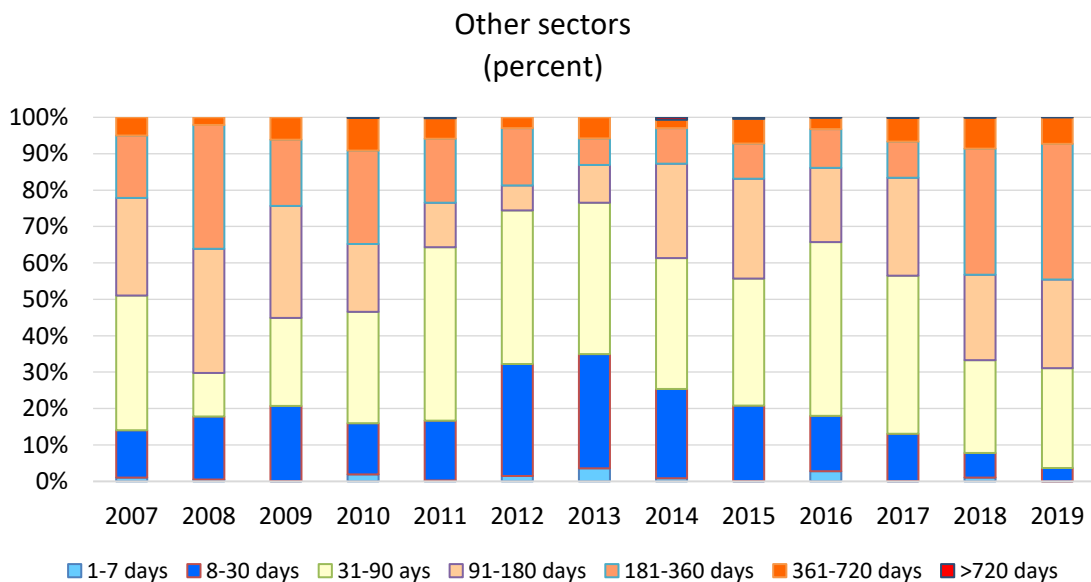


Figure 41: Outstanding FX derivative positions by original maturity, 2007–2019



V. CONCLUSIONS AND FUTURE CHALLENGES

Between 1998 and 2019, the foreign exchange market grew significantly both worldwide and, especially, in Chile as a result of globalization, the activity of multinational corporations, and the growing financial innovation associated with financial derivatives. At the same time, the greater availability of information for investors and the increased ease of trading has contributed to deepening the FX market, which is now one of the largest markets in the world.

Because it is an off-exchange market, the available information is not sufficient to support the permanent monitoring of the risks involved. Therefore, this work aims to increase information transparency and diffuse the statistical series and reports published by the Central Bank of Chile, highlighting the new breakdown of maturity profiles of institutional investors, real sector firms, and non-residents.

With regard to future challenges, significant progress has been made in Chile in the framework of compliance with the Principles for Financial Market Infrastructures (PFMIs), providing key market infrastructures like the derivatives clearing house (COMDER), which reduces the settlement risk of standardized derivatives traded by banks and recorded in the clearing house. Additionally, the derivatives trade repository (Integrated Derivatives Information System, SIID-TR in Spanish) will come on line between the last quarter of 2020 and the first half of 2021, which will give regulators access to the full order book (standardized, structured, and other products) of the main derivatives market participants in Chile, and new publications are expected to further increase transparency in the derivatives market. Finally, the incorporation of the Chilean peso into the CLS system is expected to reduce the settlement risk of FX spot transactions.

Carry trade: An investment strategy to profit from the interest rate differential between two economies, involving borrowing in the economy with the lower interest rate and simultaneously investing in the economy with the higher interest rate.

Hedger: A market participant that uses derivatives to manage the business risk associated with future price movements.

Credit default swap (CDS): A derivative instrument used as insurance against credit risk. For example, a lender may buy a CDS, paying an ongoing premium through the agreed maturity date. In exchange, in the event that the borrower defaults, the CDS seller will pay the lender the default amount.

Cross-border: A transaction between counterparties residing in different countries.

Currency swap: A contract in which the counterparties exchange interest payments in different currencies for an established period of time. At the end of the contract, the two counterparties exchange the principal or notional amount in the different currencies at a previously agreed exchange rate.

Derivatives position: The balance (expressed in notional amounts) of outstanding derivatives contracts on a given date, considering all the instruments used by banks and other agents that operate in the Formal Exchange Market. The most common are forwards, FX swaps, cross-currency swaps, and options, considering positions in Chilean pesos and UFs against foreign currencies. The net position equals the long (buy) FX position minus the short (sell) position.

Foreign exchange swap (FX swap): A transaction in which two counterparties exchange a notional amount in different currencies at the start of an operation (spot if it is immediate; forward if it is in the future) and then reverse the exchange on maturity at a previously agreed rate.

Formal Exchange Market (FEM): According to Article 41 of the Central Bank of Chile's Basic Constitutional Act, "the Formal Exchange Market (*Mercado Cambiario Formal*) is comprised of banks. The Central Bank can authorize other entities or persons to participate in the FEM, in which case they will only be permitted to engage in the specific foreign exchange operations authorized by the Bank." These other entities are primarily broker-dealers, which are identified in Chapter III (Appendix 2) of the Procedures and Forms Manual of the Compendium of Foreign Exchange Regulations, "*Personas jurídicas autorizadas por el Central Bank of Chile para formar parte del Mercado Cambiario Formal*" (Legal Entities Authorized by the Central Bank of Chile to Participate in the Formal Exchange Market).

Forward: A contract for the future exchange of a notional amount in different currencies at a specified exchange rate. The exchange can be physically delivered or non-deliverable (net settled).

Hard currencies: Liquid currencies that tend to maintain their value over time. Examples include the US dollar, euro, Swiss franc, Japanese yen, Australian dollar, and Canadian dollar.

International investment position (IIP): The balance sheet of an economy's financial wealth, represented by residents' financial assets and liabilities with non-residents.

Net spot position: The net spot position or spot FX position of the FEM is an accounting concept that corresponds to a stock, increasing with purchases and decreasing with sales of foreign currency against Chilean pesos. A positive balance indicates that there have been more purchases than sales over the life of the series; conversely, a negative balance means that the sales of foreign currency have been financed with a source other than the purchase of foreign currency; for example, when a banking company takes an external loan in foreign currency and sells that currency to a company needing to pay import transactions or remit profits abroad.

Offshore: Foreign markets.

Options: A contract in which the buyer obtains the right to buy or sell a certain currency against another currency at a previously agreed rate or price, until the contract maturity date.

Over-the-counter (OTC): Off-exchange transactions between two counterparties that are not channeled through a centralized exchange.

Spot: Exchange of two currencies at an agreed rate or price, with payment occurring within two business days.

The economies that participate in the BIS Triennial Survey were divided into blocs according to their classification (advanced or emerging) in the International Monetary Fund's *World Economic Outlook* for each year. Additionally, the blocs were created excluding the Latin American economies, which were grouped separately. Chile is not included in any of the three blocs used for the analysis.

The blocs are classified is as follows:

Advanced economies:

Australia, Austria, Belgium, Canada, Czech Republic,¹⁵ Denmark, Estonia,¹⁶ Finland, France, Germany, Greece, Hong Kong, Ireland, Israel, Italy, Japan, Latvia,¹⁷ Lithuania,¹⁸ Luxembourg, Netherlands, New Zealand, Norway, Portugal, Singapore, Slovakia,¹⁹ Slovenia,²⁰ South Korea, Spain, Sweden, Switzerland, Taiwan, United Kingdom, and United States.

Emerging economies:

Bahrain, Bulgaria, China, Hungary, India, Indonesia, Malaysia, Philippines, Poland, Romania, Russia, Saudi Arabia, South Africa, Thailand, Turkey, and United Arab Emirates.²¹

Latin American economies:

Argentina, Brazil, Colombia, Mexico, and Peru.

For figures 3, 4, and 5, market depth is calculated as the ratio of annual flows in each market to GDP.

The BIS publishes daily average spot/derivatives flows, which were annualized by multiplying by the number of international trading days, to approximate total trading days in the year for all countries. The number of days is calculated as the number of calendar days in the year, minus weekends and minus bank holidays in London, where the latter was chosen given its importance in global FX markets.

Normalizing by the size of the economy makes it possible to compare different countries or blocs. In the case of offshore centers like Hong Kong and Singapore, activity is much higher than would be implied by the size of their economies.

¹⁵ The Czech Republic is considered advanced starting with the 2010 survey.

¹⁶ Estonia is considered advanced starting with the 2013 survey.

¹⁷ Latvia is considered advanced starting with the 2016 survey.

¹⁸ Lithuania is considered advanced starting with the 2016 survey.

¹⁹ Slovakia is considered advanced starting with the 2010 survey.

²⁰ Slovenia is considered advanced starting with the 2007 survey.

²¹ The United Arab Emirates entered the survey for the first time in 2019.

$$\text{Depth} = \frac{\text{Annual transactions}}{\text{GDP}}$$

The depth of a bloc of economies is estimated by calculating the weighted average of the individual country ratios, using GDP as the weight:

$$\text{Bloc depth} = \frac{\sum_{i=1}^n w_i x_i}{\sum_{i=1}^n w_i}$$

where w is the GDP of country i and x is the ratio for country i

Figures 3, 4, 5, and 6 use GDP data published by the IMF in the *World Economic Outlook Database* for April 2019, using current prices in USD equivalents. The 2019 series in the figures were calculated with 2018 GDP data. To date, real GDP data are not available for all countries, so the following were calculated based on the estimates published by the local source: Austria, Bahrain, Belgium, Colombia, Czech Republic, France, Greece, Ireland, Israel, Italy, Luxembourg, Mexico, New Zealand, Norway, Portugal, Russia, Slovakia, Slovenia, Singapore, South Africa, South Korea, Switzerland, Thailand, and United Arab Emirates.

APPENDIX 3 –2019 Indicators by Country

2019 Indicators by Country

Country	Bloc	Spot + Derivatives (Annual turnover/GDP)	Spot (Annual turnover/GDP)	Derivatives (Annual turnover/GDP)	Derivatives/spot ratio	Spot cross- border/spot total ratio	Derivatives cross- border/derivatives total ratio
Singapore	Advanced	448	108	341	3.2	0.9	0.9
Hong Kong	Advanced	441	78	363	4.7	0.9	0.8
United Kingdom	Advanced	320	102	218	2.1	0.4	0.6
Luxembourg	Advanced	212	32	180	5.7	0.6	0.8
Switzerland	Advanced	99	23	76	3.3	0.9	0.8
Denmark	Advanced	46	11	35	3.1	0.9	0.9
Australia	Advanced	21	6	15	2.6	0.8	0.7
Japan	Advanced	19	5	14	2.8	0.6	0.6
Netherlands	Advanced	18	3	15	5.0	1.0	0.8
Norway	Advanced	17	1	17	17.5	0.5	0.6
Belgium	Advanced	17	2	15	7.2	0.8	0.7
Sweden	Advanced	17	2	15	6.9	0.8	0.8
United States	Advanced	17	6	11	1.9	0.7	0.8
Canada	Advanced	16	3	13	5.0	0.6	0.6
France	Advanced	15	2	13	6.3	0.8	0.8
Chinese Taipei	Advanced	13	4	8	1.9	0.5	0.4
New Zealand	Advanced	12	1	10	7.5	0.6	0.6
Austria	Advanced	9	2	7	4.4	0.9	1.0
Korea	Advanced	9	3	6	1.8	0.3	0.4
Germany	Advanced	8	1	7	5.6	0.8	0.8
Czech Republic	Advanced	8	1	7	12.3	0.9	0.9
Spain	Advanced	7	1	6	4.1	0.9	0.9
Finland	Advanced	6	1	5	8.1	0.6	0.6
Ireland	Advanced	5	0	4	9.3	0.8	0.9
Israel	Advanced	5	1	4	5.7	0.6	0.4
Latvia	Advanced	3	1	2	1.7	0.9	1.0
Italy	Advanced	2	0	2	7.1	0.7	0.8
Portugal	Advanced	2	0	1	2.9	0.8	1.0
Slovakia	Advanced	2	0	1	7.2	0.7	0.9
Greece	Advanced	1	0	0	1.4	0.5	0.8
Lithuania	Advanced	0	0	0	0.4	0.6	0.8
United Arab Emirates	Emerging	27	5	23	5.0	0.7	0.6
South Africa	Emerging	14	2	12	8.2	0.7	0.7
Bahrain	Emerging	13	3	10	3.3	0.8	0.9
Bulgaria	Emerging	8	7	1	0.2	0.1	0.9
Thailand	Emerging	7	2	5	2.3	0.6	0.5
Malaysia	Emerging	7	2	6	3.5	0.6	0.4
Russia	Emerging	7	3	4	1.1	0.3	0.7
Hungary	Emerging	6	1	5	4.5	0.6	0.9
Turkey	Emerging	6	2	4	2.3	0.9	0.6
Poland	Emerging	4	1	3	2.5	0.5	0.8
India	Emerging	4	2	2	1.1	0.3	0.1
Philippines	Emerging	3	2	1	0.7	0.3	0.3
Romania	Emerging	3	1	2	2.2	0.4	0.9
China	Emerging	3	1	2	2.1	0.2	0.3
Saudi Arabia	Emerging	2	1	1	1.2	0.5	0.6
Indonesia	Emerging	2	1	1	0.8	0.5	0.4
Chile	Latin America	7	3	4	1.1	0.2	0.5
Mexico	Latin America	4	2	3	1.7	0.6	0.7
Colombia	Latin America	3	2	2	1.0	0.2	0.5
Brazil	Latin America	3	1	2	1.7	0.5	0.7
Peru	Latin America	2	1	1	0.6	0.1	0.5
Argentina	Latin America	1	1	0	0.1	0.1	0.6

Information on the Chilean FX market is published in different formats on the Central Bank of Chile's website

(a) Daily Report:

The Daily Report contains the main national financial operations carried out between the selected date and T-3 (depending on the lag of the published data). It is broken down into the following sections: liquidity, open market operations, debt, benchmark prices, and formal exchange market. The latter provides a summary of spot and derivative transactions by FEM participants.

<https://si3.bcentral.cl/Informativodiario/secure/main.aspx>

(b) Monthly Report on Foreign Exchange and Derivatives Statistics:

This report is published monthly and presents the main FX statistics for the FEM for transactions between local and foreign currencies. It is complemented with a set of figures in Excel.

<https://www.bcentral.cl/en/areas/statistics/exchange-statistics/exchange-market>

(c) Statistical Bulletin

The Statistical Bulletin contains statistics on the FX market and is updated on the 7th and 23rd of each month or the next business day.

https://si3.bcentral.cl/estadisticas/Principal1/enlaces/Informes/BOLETIN/index_bm.html

(d) Statistics Database (SDB):

The SDB provides FX market statistics disaggregated by financial agent, instrument, and maturity. The series are published daily and monthly.

<https://si3.bcentral.cl/Siete/en>

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