BOX II.1

Settlement Risk of FX market in Chile

The daily trading volume in the global foreign exchange (FX) market, equivalent to around US$7.5 trillion, generates high interdependence between markets and payment systems around the world (BIS, 2022)[2]/. When these transactions involve the physical delivery of foreign currency, they are exposed to settlement risk, i.e. the risk that one of the parties involved in the currency exchange does not deliver the owed currency at the time of payment[2]/.

The materialization of settlement risk in the FX market can cause significant losses and pose a potential threat to financial stability. For this reason, the central banks of the world's major economies —jointly with the private sector— have been working for decades to reduce FX settlement risk. In practice, there are different settlement mechanisms to mitigate this risk , such as bilateral netting and the use of other payment versus payment (PvP) systems such as local FX clearinghouses and the Continuous Linked Settlement (CLS) system, or others available, especially in Asia and Europe (BCBS, 2013)[3]/. Typically, these mechanisms are characterized by conducting clearing prior to settlement as they have a PvP at the time of settlement[4]/.

According to the latest BIS Triennial Survey 2022, FX operations involving physical delivery at the global level are mostly settled through some mechanism with risk mitigation. However, almost one-third of the traded volume in the FX market with global physical delivery is still exposed to settlement risk (Glowka and Nilson, 2022). The settlement risk is so persistent because existing PvP mechanisms are unavailable in certain jurisdictions or currencies, or are not suitable for certain transactions, or are too expensive for some participants (Bech et. al, 2019; Glowka and Nilson, 2022)[4]/.

In Chile, the notional amount traded in the FX market (spot and derivatives) is more than seven times the annual GDP, totaling US$2.2 trillion in a year, of which 39% is exposed to settlement risk (Table II.5 A)[6]/. More than half of these transactions are non-deliverable forward (NDF) derivative transactions, which by definition are not exposed to settlement risk as they do not involve the exchange of foreign currency. On the other hand, the settled amount of FX transactions involves the physical delivery of foreign exchange and is therefore potentially exposed to settlement

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1/ This market includes both derivatives and spot market transactions. A trillion is a thousand billion.

2/ Settlement risk in the FX market is also known as Herstatt risk in reference to the bankruptcy of Bankhauss Herstatt in 1974 that gave rise to the BIS Basel Committee on Banking Supervision (Galati, 2002).

3/ The CLS is an international payment system constituted as a special-purpose bank in the United States and as an infrastructure in the United Kingdom. It is supervised by the Federal Reserve and the cooperative supervision of the central banks of the 18 currencies included in the system. It has been in operation since September 2002. Regarding the steps currently being taken by the BCCh for Chile's incorporation into CLS, see Chapter III, section "Developments in cross-border payment systems" below.

4/ Under the PvP mechanism, the final payment of one currency occurs if and only if the final payment of the other currency has been made already.

5/ In many of these economies, the use of correspondent banking as a settlement mechanism prevails. Under this scheme, a bank (foreign correspondent) holds deposits belonging to other local banks and provides payment and other services to such local banks.

6/ The depth of the foreign exchange market in Chile, measured as the ratio of notional volume traded in a year to GDP, is higher than the average of emerging economies, although lower than that of more advanced economies' (Villena and Hynes, 2020).

risk[4]. These operations are mainly explained by spot market transactions (Table II.5 B).

More than 40% of the total FX operations by physical delivery settled in Chile correspond to operations between counterparties in the Formal Foreign Exchange Market (MCF in Spanish) (Table II.5 C)[8]. In Chile, these transactions are settled bilaterally between the parties involved through traditional correspondent banking arrangements, which implies that they are exposed to settlement risk, since there is no direct coordination between the payment of the two currencies involved. In practice, the local currency leg of such transactions is cleared and settled through the large-value payment systems (Clearing House for Large-Value Payments in Local Currency (CCAV MN) and the Sistema LBTR), while the foreign currency leg is settled through correspondent banks in the jurisdiction of the respective currency. This situation could change in the short term with the start-up of the Clearing House for Large-Value Payments Clearing House in Foreign Currency (CCAV FX), scheduled for the end of 2023, which will allow the clearing of interbank peso/dollar spot transactions following the PvP standard, synchronizing the clearing of both legs of each transaction, in addition to having a design that will allow the settlement in the respective Sistema LBTR under this same standard (FSR, 2020).

Meanwhile, more than one third of settlements in the FX market with physical delivery in Chile are made with counterparties from the real sector and other financial institutions that are not part of the MCF (Table II.5 C)[9]. These operations are traditionally settled using credit lines and under the scheme where the bank first receives the amount traded, which protects it against counterparty risk. However, these operations are also exposed to settlement risk, for the same reasons described above. In addition, since these counterparties are non-bank counterparties, they need to indirectly access the CCAV FX or other infrastructure that could provide the clearing and settlement service in the future.

FX market transactions with physical delivery made with non-residents, which historically accounted for an average of around 5% of the total settled, increased their relative importance in 2022, up to 10% of the total. The participation of non-residents as counterparties in the FX market with physical delivery is directly related to the possibility of the Chilean peso being used internationally (FSR, 2020). To the extent that this trend continues, the settlement risk of these operations may be mitigated, either through the indirect operation of non-residents in local infrastructures, or via the potential incorporation of the peso into the CLS (FSR, 2019; FSR, 2021).

Within the "Other" counterparty, settlement transactions between local banks and the BCCh stand out, and most recently represented 7% of the total settlement of FX market transactions

7/ Clearing operations consider those that involve only a single payment at the time of settlement, e.g., NDF (non-deliverable forward). Physical delivery operations consider those involving two or more payments at settlement, e.g., spot, forward, FX swap and Cross-Currency Swap.

8/ The MCF is made up of banks and other financial institutions with BCCh authorization to participate in it, mainly brokerage firms and securities dealers. In practice, nine financial institutions in the MCF account for more than 80% of the volume settled in this market.

9/ The real sector and the financial sector that are not part of the MCF represent 21% and 20% of the counterparties of the total amount settled (spot plus physically delivered derivatives). Even the real sector accounts for more than 40% of the transactions settled in physically delivered derivatives.

with physical delivery. These transactions, while they can be settled through the Sistema LBTR in US dollars since 2019, are not settled through a PvP mechanism as such[10]/. In any case, as these operations are settled within the local infrastructure of the Sistema LBTR, their operational, credit and settlement risk is smaller compared to traditional settlement through correspondent banks[11]/.

Briefly said, operations in Chile are mostly settled through traditional correspondent banking arrangements, exposed to settlement risk, although several initiatives promoted by the BCCh could contribute to mitigating it. The future implementation of the CCAV FX will allow the centralized clearing of interbank spot-dollar transactions following the PvP standard for more than 40% of the physically delivered transactions currently performed. Additionally, the incorporation of PvP standards at the gross settlement level in the Sistema LBTR would contribute to mitigate this risk. Besides, the advancement of the peso's internationalization agenda will contribute to increase the participation of non-residents in the FX market with physical delivery, which in principle could increase the amount exposed to settlement risk of local agents. However, this risk could be mitigated to the extent that international agents can settle these transactions through local or international PvP mechanisms, either as participants in the CCAV FX or through the possibility of clearing the Chilean peso in the CLS.

[10]/ It should be noted that the BCCh is currently analyzing the possibility of introducing the PvP standard at the gross settlement level into the Sistema LBTR.

[11]/ All in all, the total volume of these operations is rather limited as a fraction of total settlements in the system (see Chapter II herein).

TABLE II.5 FOREIGN EXCHANGE MARKET IN CHILE

	2007-2011	2012-2016	2017-2021	2022
A. Notional amount traded a/				
Total b/	1.414.384	2.073.085	2.060.018	2.227.608
of which: by clearing c/	51%	54%	57%	61%
of which: by physical delivery d/	49%	46%	43%	39%
B. Amount settled e/				
Total b/	759.096	1.039.333	958.609	957.609
of which: spot	91%	92%	92%	92%
C. Percent settled by counterparty				
Intra-MCF f/	50%	52%	52%	43%
Other financial g/	22%	18%	19%	20%
Real sector	18%	21%	17%	21%
Non-residents	4%	5%	6%	10%
Others h/	6%	4%	6%	7%

a/ The notional amount traded considers local currency transactions in exchange for foreign currency of FX and spot FX derivatives of the Formal Foreign Exchange Market (MCF in Spanish). Spot transactions do not include those corresponding to derivatives spot transactions.

b/ Millions of US dollars.

c/ Clearing transactions consider those that involve a single payment at the time of settlement, e.g. NDFs.

d/ Physical delivery transactions include those involving two or more payments at the time of settlement, e.g. Spot, Forward, FX Swap and Cross-Currency Swap.

e/ The amount settled considers physical delivery transactions settled during the period, and may differ from the physically delivered amount traded given the settlement terms given the terms involved with derivatives.

f/ Considers transactions between members of the MCF, which includes banks and other entities authorized by the BCCh to trade in it.

g/ Pension Funds Managers (AFPs), Insurance Companies, Brokerage Firms and General Fund Administrators (AGF).

h/ Includes transactions with the Central Bank and the Treasury.

Source: Central Bank of Chile.