Exchange rate policy and exchange rate interventions: the Chilean experience

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In this paper we review Chile's experience with exchange rate flexibility since the early 2000s. Since the abandonment of the target zone for the exchange rate at the end of the 1990s, the Central Bank of Chile has been strongly committed to exchange rate flexibility, allowing the exchange rate to fluctuate in response to different shocks. As a result, the floating regime in Chile has worked very well in different dimensions. In particular, we discuss how the credibility of the floating regime has significantly lowered the currency mismatch of assets and liabilities in the corporate sector and has enhanced the role played by exchange rate movements in adjusting the economy to financial and terms-of-trade shocks. In spite of its commitment to the floating regime, the Central Bank of Chile has intervened the exchange market on a few exceptional occasions. We review two of these interventions, which occurred in 2008 and 2011, discussing their mechanisms, effectiveness and potential drawbacks.

Keywords: exchange rates, floating, interventions, credibility

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I. Introduction

Chile conducts its monetary policy under a flexible Inflation Targeting (IT) framework. Although this framework was implemented more than 20 years ago, it was in 1999 that a floating regime was adopted and a fixed target for the annual rate of inflation was set at 3%.[3] Also, since April 2001 the main policy instrument has been the short-term nominal interest rate. During all these years, this policy framework has succeeded at keeping inflation low and stable while at the same time allowing the country to confront severe external shocks with moderate impacts on the domestic economy.

Under the IT framework, the exchange rate floats freely but plays a role in policy decisions, inasmuch as it affects expected inflation – the operational target for the Central Bank of Chile (CBC). Since the adoption of the full-fledged version of the flexible IT regime in the late 1990s, with the abandonment of a target zone for the exchange rate and the establishment of a permanent target for inflation, the Central Bank of Chile has been one of the most committed central banks in terms of exchange rate flexibility, allowing the value of the domestic currency to freely adjust to different shocks. Sticking to a flexible exchange rate regime reflects the conviction of the Central Bank regarding the IT regime. It also reflects the view that a rigid exchange rate may induce some vulnerabilities in the economy, and reduce the degrees of freedom to adjust to external shocks, as the negative experiences of the crisis in 1982 and the recession of 1998 can attest.

As explicitly stated in the official communiqué of September 1999, and more in depth in the report to the Senate that year, the adoption of the fully floating regime at the end of the 1990s was based on the assessment that the Central Bank had gained credibility in terms of controlling inflation, that hedge markets were more developed, and that there were no significant mismatches in the private sector's balance sheets. Also, it was stated that having a floating currency would give the Central Bank more autonomy to manage its monetary policy and that it would enhance its capacity to confront external shocks.

In spite of this, the Central Bank has occasionally intervened in the exchange market during this latter period. In the early 2000s there were two episodes of intervention. In 2001 and 2002, following sharp depreciations of the Chilean peso associated with financial turmoil in Argentina and the political election in Brazil, a sizable increase in expected inflation threatened the fulfillment of the newly established inflationary objective of the Central Bank. The option of adjusting the interest rate to affect the value of the currency and influence the increase in expected inflation was considered not optimal, as the economy was still weak in the aftermath of the recession of 1999. Moreover, the bad experience of 1998, when the Central Bank raised the interest rate substantially to defend the peso, with consequent detrimental impact on domestic demand, contributed to tilting the view in favor of an exchange rate intervention. In 2001, the intervention program consisted of spot sales of US dollars, while the program of 2002 was implemented through the issuance of dollar-denominated debt.[4] In both cases, the total amount

[3] See: http://www.bcentral.cl/prensa/comunicados-consejo/pdf/02091999.pdf

[4] See Tapia and Tokman (2004) and De Gregorio and Tokman (2005) for an evaluation and discussion of the context, rationale and impact of these programs.

of the program was announced the day before the intervention. However, in the second case only a fraction of the resources announced were actually sold.

Between 2002 and 2008 no forex intervention took place. In 2008 and 2011, in the context of appreciative pressures on the Chilean peso, the Central Bank of Chile implemented two programs of foreign exchange purchases. These programs were aimed at increasing the size of international reserves in a situation where the Chilean peso was strong.[5] While these interventions were successful in some dimensions, they were not cost-free. In particular, the two programs increased the currency mismatch in the balance sheet of the Central Bank, leading to large capital losses.[6]

In the rest of the paper, we describe broadly the evolution of the exchange rate and current account in Chile over the past twenty years. We explain the recent foreign exchange interventions, discussing their rationale and their implementation strategy. Then we present a preliminary assessment of the effectiveness of these interventions and discuss their cost. Finally, we present some conclusions.

II. Exchange rate trends and the current account

Since the adoption of the floating regime in September of 1999, the Chilean peso has exhibited more volatility both in real and nominal terms than in the previous period (Figure 1). This higher volatility largely reflects the fact that during the last twelve years the economy has suffered major external shocks (i.e. Russian and Argentinean defaults, a surge in commodity and food prices, and the global financial crisis). To some extent, the higher volatility is the natural consequence of adopting a flexible exchange rate system in a small open economy subject to continuous shocks, in the sense that under this regime the exchange rate is the main adjusting variable vis-à-vis external shocks.

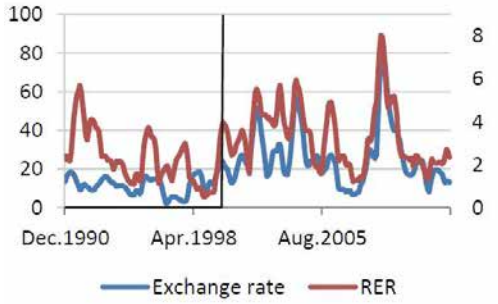
Despite this higher volatility during the 2000s, the real exchange rate has not followed a clear trend, a contrast with the systematic real appreciation of the currency observed during the 1990s (Figure 2). Several hypotheses have been proposed for this. On the one hand, it may reflect a certain slowdown in relative productivity growth vis-à-vis the rest of the world after the Asian crisis. Throughout the 1990s there were major productivity gains and a catch-up in the mining sector that justified an appreciative pressure on the real exchange rate. During the 2000s, productivity gains in Chile were less strong, and the productivity of Chile´s trade partners grew substantially (eg China). According to the Balassa-Samuelson hypothesis, this change in relative productivity trends may justify a less intense tendency toward real appreciation.

[5] Strictly speaking, a third episode of intervention was experienced in late 2008. Right after the Lehman Brothers collapse, the program of purchasing dollars was halted and a series of dollar swaps was offered to the market to provide short-term liquidity in foreign currency. This policy did not involve any change in the Central Bank's net asset position in foreign currency. In that sense, it was a liquidity measure rather than a true intervention in the foreign exchange market.

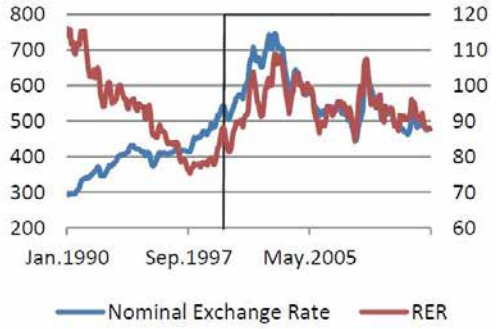
[6] Currently, the negative net worth of the Central Bank is about 3% of GDP. See Restrepo et al. (2009) for a description of the causes of the negative capital of the CBC.

On the other hand, the 1990s were a period of significant capital inflows to Chile as well as to other developing countries – on top of the investment flow directed to the mining sector – a situation that contributed to increased domestic expenditure, and to the systematic appreciation of the real exchange rate. These capital inflows arrived in part as responses to the productivity gains described above. However, they were also part of a broader wave of inflows to emerging markets during that period that goes beyond idiosyncratic development in Chile. Lastly, the strengthening of the Chilean peso during the 1990s might also reflect the outcome of the target zone for the exchange rate that was in place until 1999. When the target zone for the exchange rate was inconsistent with fundamentals, short-term capital inflows were encouraged and a real appreciation of the currency occurred (see De Gregorio, 2011).[7]

Exchange rate volatility Figure 1



Nominal and Real Exchange Rate levels Figure 2



Nominal and real exchange rate volatility measured as the rolling standard deviation within a year, based on monthly data. The nominal exchange rate is measured as pesos per dollar, and that an increase in the Real Exchange Rate index is a depreciation.

Sources: Central Bank of Chile and authors' estimates

The large capital inflows and the appreciation of the currency during the 1990s led to a substantial widening of the current account deficit until 1998, when it reached 5% of GDP (Figure 3). Then, as a consequence of the Asian crisis and the resulting capital outflows, in 1999 there was a significant reversal in the current account, equivalent to 5 percentage points of GDP. The current account deficit was around 1% of GDP between 2000 and 2004. In 2005 the surge in commodity prices – copper in particular – led to a substantial increase in the current account surplus. This increase was driven by high public savings resulting from the application of a structural fiscal rule to anchor public expenditure. This structural rule has been in place since 2001 and it establishes – among other things – that any extra government revenues from copper exports due to transitorily high prices are to be saved.[8] So the surge in copper prices since 2005, considered in part transitory, meant an important surplus in the public balance until 2009.

Since the outbreak of the financial crisis in 2008, the current account has been more volatile, reflecting the impact of changing financial and terms-of-trade conditions. In particular, by the end of 2008 a dramatic fall in copper prices coupled

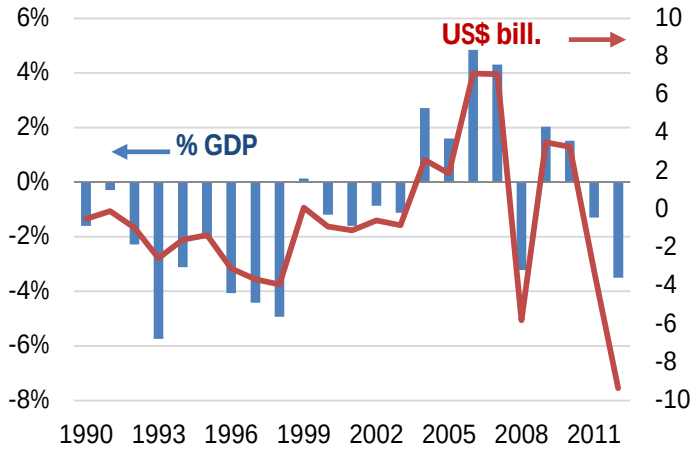
[7] A recent paper by the IMF shows that a more flexible exchange rate helps to dampen an appreciation of the real exchange rate stemming from capital inflows. See Combes et al. (2011).

[8] This rule was self-imposed by the government. The fiscal responsibility act of 2006 defined more explicitly certain procedures with respect to this rule and strengthened the institutional structure surrounding it.

with still dynamic domestic demand resulted in a current account deficit of almost 3% of GDP. The contraction in aggregate demand resulting from the crisis led to current account surpluses in 2009 and in 2010. This contraction in demand occurred despite the strong fiscal and monetary policy reaction implemented during this period. Lately, the sharp rebound in demand – related to the lagged effect of macro policies, high terms of trade, a surge in mining investment and attractive financial conditions for the Chilean economy – has driven the current account back into a deficit, which is estimated at slightly above 3.5% of GDP in 2012.

Current Account

Figure 3



Source: Central Bank of Chile.

III. Foreign exchange interventions and international reserves

The exchange rate market interventions during the 1990s resulted in a high accumulation of foreign reserves, which grew hand in hand with the economy. As a result, the reserve-to-GDP ratio fluctuated around 22% during most of the decade (see Figure 4). With the adoption of the floating regime by the end of 1999, the CBC hardly intervened in the exchange market, with the exception of the two programs of the early 2000s described above and the two programs implemented in the last five years. As mentioned, the first of these programs consisted in sales of international reserves in the spot market, whereas the second involved only the issuing of dollar-denominated liabilities. The first program generated sales of foreign reserves of only 800 billion US dollars, while the second generated none. As a consequence, during the 2000s the dollar amount of reserves stayed virtually constant and the reserve-to-GDP ratio fell almost to 10% by 2007 due to the steady growth of the economy and a real appreciation of the currency during the period.

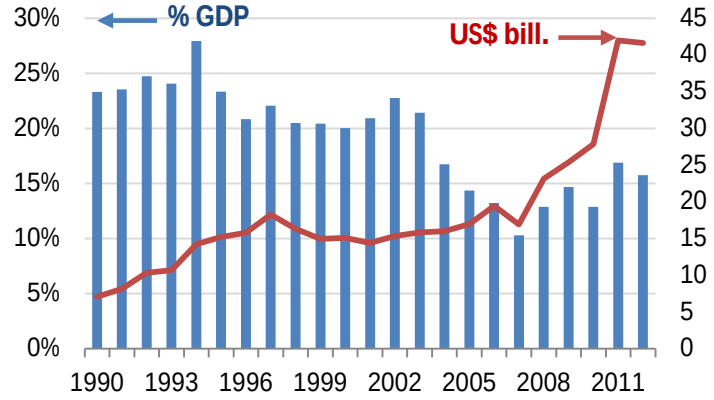
In April 2008 a new intervention was launched. Shortly before that date, the Chilean peso was appreciating significantly in the context of a high – and increasing – domestic inflation rate, and the unfolding global financial crisis. The CBC announced a program to accumulate reserves of up to USD 8 billion throughout the remainder of that year. The program was suspended at the end of September, following the collapse of Lehman Brothers, when the Central Bank had accumulated about

USD 5.75 billion. During the weeks following this event, a new program was introduced to provide short-term liquidity in foreign currency. The three-week program consisted in auctioning USD 500 million in foreign exchange swap contracts with a maturity of one month. Later, this program was extended for the following six months, and the maturity of each swap was also extended to either 60 or 90 days. This program was intended to provide up to USD 5 billion in dollar liquidity to compensate for the lack of foreign short-term financing during the crisis.[9]

In January 2011, again in a context of appreciative pressures on the Chilean peso, a new program of reserves accumulation was launched. This program lasted a year and consisted in buying USD 12 billion in the spot market at an average of USD 50 million per day. By the end of 2011, foreign reserves had climbed to more than USD 40 billion, equivalent to 17% of GDP, above the levels it had reached in 2010 but still below the averages observed during the 1990s.

International Reserves

Figure 4



Source: Central Bank of Chile.

IV. Rationale and mechanics of the latest exchange rate interventions in Chile

As mentioned above, the rationale behind these last two interventions was mainly to accumulate international reserves and to curb excessive short-term fluctuations in the exchange rate, as clearly stated in the official notes released by the Board on those occasions. The precise timing of those interventions was related to the trajectory of the currency, as they occurred at moments when the peso had appreciated more than would be consistent with its long-term fundamentals. In fact, in both cases the Central Bank made references to the situation of the foreign exchange market in its communications.

In the first of these two programs, in April 2008, the main argument for the intervention was to strengthen the international liquidity position of the Chilean

[9] Ex-post, few institutions participated in the auctions and many of the auctions were declared void.

economy to confront a potential abrupt worsening of the external scenario. However, the official communiqué also stated that the program was consistent with the assessment that the real exchange rate had appreciated above what it would be once real and financial conditions in the global economy returned to normal.[10]

The rationale for the second program, in 2011, was also based on the fact that the level of international reserves in Chile was low compared with other similar countries. This time, the communiqué argued that although there were upward pressures on the value of the peso, the expected transitory effects of the intervention on the foreign exchange market would contribute to easing the real adjustment in the economy: *"[T]he program could have a short-lived impact on the exchange rate, but these short-term effects could facilitate and smooth out the real adjustments the economy required to confront the external turbulence."* It also recognized that the financial costs for the CBC of such a program were high. Finally, the communiqué ended by mentioning that a flexible exchange-rate regime had proved good for the country, and that it was important to keep in mind that interventions were the exception rather than the rule.[11]

The two interventions shared the strategy of pre-announced programs of purchases of foreign exchange for a period of about a year each. In both cases, the total amount of reserves to be bought was explicitly stated. In each of these programs the amount of daily purchases was disclosed in advance, and the only degree of freedom the Central Bank kept was to decide the date of the auction. Also, in both cases there was no explicit or implicit conditioning of the program on the exchange rate's level or volatility. However, the CBC made clear that it would reserve the right to suspend or alter the program whenever it deemed this necessary, as was the case in September 2008 with the unfolding of the global financial crisis. Finally, both interventions were sterilized by issuing nominal and inflation-indexed Central Bank debt.

The transparency of the interventions in terms of the amounts to be purchased, the duration, and the schedule of daily auctions, without any conditions regarding the evolution of the exchange rate, was intended to signal the commitment of the Central Bank to a flexible exchange rate system. Thus, any change in the value of the currency would have no impact on the pre-announced program.

V. An assessment of the effectiveness of recent foreign exchange interventions

The effectiveness of foreign exchange interventions should be evaluated in relation to their objectives. In this sense, the interventions of 2008 and 2011 were successful – although the former was suspended before completion – as they contributed to raising the reserve-to-GDP ratio. As mentioned above, in the first program the CBC increased its international liquidity by USD 5.75 billion, while in the second it accumulated an extra USD 12 billion. In all, international reserves increased by more than 5% of GDP under the two programs.

[10] See http://www.bcentral.cl/prensa/comunicados-consejo/otros-temas/10042008.pdf

[11] See http://www.bcentral.cl/prensa/comunicados-consejo/otros-temas/03012011.pdf

However, this criterion is too narrow to measure the impact of the intervention programs. As to the effects of these interventions on the trajectory of the exchange rate, the evidence is unclear. Before the first intervention, in April 2008, the exchange rate had been appreciating to levels that were considered not fully consistent with its long-term fundamentals. After the intervention was announced, the exchange rate depreciated by more than 25% to the end of September 2008, the eve of the collapse of Lehman Brothers. However, given the special circumstances prevailing during that period, it is very difficult to assess how much of this depreciation of the currency can be attributed to the intervention. The program was launched at a moment when inflation in Chile was high: it reached 8.5% in March 2008 – well above the 3% target of the Central Bank – and then it kept on rising to reach 9.9% in October of that year. Therefore, in real terms, the depreciating trajectory of the currency after the intervention was somewhat less intense: about 18% to September 2008. Also, along with the intervention there was a sizable rise in inflation expectations. So if there was an effect on the currency, it could have been the result of a change in perception regarding the commitment of the Central Bank to fighting inflation – the signaling channel – rather than a liquidity or portfolio effect through the operations in the spot market. In any case, real interest rates did not significantly fall after the intervention, which suggests that the signaling channel may not have been that relevant, although some empirical evidence shows that a signaling effect occurred (see below). Lastly, the depreciation of the currency also occurred at a moment when the appetite for risk was decreasing, uncertainty in financial market was rising, and the terms of trade had begun to deteriorate. Overall, it is possible that the intervention helped align the exchange rate with its long-term fundamentals, and allowed it to price in the global financial risk, which until then had not been fully internalized by the domestic foreign exchange market.[12]

In the second intervention, there was a short-lived depreciation of the currency that lasted for about two weeks. Then the exchange rate returned to the levels it had been at before the intervention and continued on an appreciating trajectory until the end of 2011, when a global sell-off in the financial market triggered a major depreciation of the currency. Therefore, in this case if the intervention had an effect on the exchange rate, the effect was short lived despite the amount of reserves being bought.

Preliminary empirical evidence based on event studies finds little evidence of a significant impact of these two interventions on the level or volatility of the exchange rate in Chile. A recent joint-methodology study conducted by the BIS using intraday transactions concludes that the program in Chile had no impact on the level of the exchange rate.[13] If that is the case, this could be the result of the intervention strategy where, as mentioned before, there was a clear pre-announcement of the entire intervention program. This contrasts with the experiences of central banks where interventions have not been pre-announced. It could also reflect that Chile has a financial market that is well integrated with the

[12] In this sense, the intervention may have had an effect through the "coordination channel". Coordination failures may induce the exchange rate to deviate from equilibrium values for extended periods because of autoregressive trading dynamics (Taylor and Allen, 1992). Under this circumstance a central bank intervention could serve to disrupt extrapolative trading and coordinate trading in the direction of equilibrium (Archer, 2005).

[13] BIS Report (2013).

rest of the world and that the risk premium is low. Thus, the portfolio channel would be less effective in our economy.

The BIS study also shows that there is some evidence that in Chile interventions increased – rather than reduced – the intraday volatility of the exchange rate. Although this may sound counterintuitive, the results suggest that the daily spot market operations by the Central Bank could have introduced some noise, raising the risk of sharp movements in the value of portfolios, and thus discouraging carry trade operations. This result is also consistent with Doroodian and Caporale (2001), who find that exchange rate interventions in the US were associated with a significant increase in the intraday conditional variance (uncertainty) of bilateral spot exchange rates.

The small impact of these programs on the level of the exchange rate is consistent with the evidence for earlier interventions in Chile that found that, if at all, interventions affected the exchange rate through the signaling channel (Tapia and Tokman, 2004). As mentioned before, this is not surprising given the intervention strategy implemented in those episodes, where most of the information was provided with the announcement. It is also consistent with other evidence for emerging markets as summarized by Disyatat and Galati (2005). In principle, the portfolio channel could be relevant if interventions materially change the relative supply of domestic- and foreign-currency-denominated assets. In the case of the latest intervention program in Chile, the change in the net position of the Central Bank was large, but probably not large enough for that, given the size of the portfolio position of the different agents.[14] On the contrary, the daily purchases of USD 50 million represented on average only 1.33% of the daily foreign exchange market turnover. Therefore, in terms of the order flow channel, the interventions were rather small.

VI. The cost of intervention

The most evident and direct cost of FX interventions is their financial cost. Typically, countries that intervene have a positive interest rate differential vis-à-vis the rest of the world. In that context, the cost of the liabilities that are used to sterilize the FX interventions is larger than the return on international reserves. This financial cost of international reserves precludes countries from accumulating large amounts of reserves as self-insurance against external liquidity shocks. Moreover, this cost will be weightier if the financial position of the central bank is weak or, more generally, if the consolidated public position is weak.

Systematic interventions in foreign exchange – if they succeed in reducing the volatility of the currency – could send the wrong signals to the private sector regarding the risks of exchange rate fluctuations. This could then affect the willingness to hedge asset positions, and expose the corporate sector to currency mismatches. One of the advantages of a credible floating system is precisely that it tends to minimize currency mismatches in the private sector, which by itself

[14] In this sense, it is likely that the portfolio channel could work more effectively in economies less financially integrated or with a larger external premium and less external investments, as the degree of substitution between domestic-currency-denominated assets and foreign currency assets would be lower.

dampens the possible detrimental balance sheet effects of exchange rate fluctuations. A fully flexible exchange rate, by increasing the variance of the real exchange rate in the short and medium term, should increase the relative risk of dollar debt, tilting the scale in favor of local-currency-denominated debt. For the case of Chile, empirical evidence by Cowan et al. (2006) finds significant changes in the level of currency exposure after the implementation of a floating exchange rate regime in 1999. This evidence thus suggests that an intervention policy that reduces the volatility of the exchange rate could increase the exposure by introducing an implicit exchange-rate insurance.

Somewhat more general is the evidence by Kamil (2006). He shows that the adoption of a floating exchange rate regime leads to a higher degree of currency matching in firms' balance sheets, thus reducing the corporate sector's financial vulnerability to exchange rate fluctuations. This finding is robust to alternative identification methods of exchange rate regimes and different measures of currency exposure at the firm level. Overall, the results suggest that under a floating exchange rate regime, firms (or their creditors) become more aware of the exchange rate risk, and thus mitigate their foreign exchange exposure by closing their foreign currency positions. Based on this view, one of the reasons for the transparent and straightforward intervention strategy of the last two programs in Chile, without any implicit or explicit commitment to a certain value of the currency, was precisely to avoid any jeopardizing of the credibility of the floating regime, and hence not to encourage balance sheet mismatches.

Another dimension of possible moral hazard problems in intervention is that lower exchange rate volatility is related to short-term speculation against the currency. In fact, exchange rate volatility may deter financial speculation against the currency. If the central bank has a weak commitment regarding a defined level for the exchange rate, the absence of currency risk in the short run may encourage financial market participants to take advantage of interest rate differentials. As long as the currency is free to float, and that implies more volatility and uncertainty regarding the currency level, the incentive to arbitrage interest rate differentials could be reduced. Soto and Valdés (1999) present mixed evidence about this phenomenon in Chile and a set of countries. The evidence of the recent BIS report, however, points to increased volatility as a result of the intervention in Chile. If that had been the case, then interventions could have helped to reduce carry trade operations and sustain a more depreciated currency.

One of the main costs of exchange rate intervention is that it may contradict other objectives of the central bank. For example, in a context of high inflation an exchange rate intervention may be interpreted by market participants as a weaker commitment to the inflationary objective of the central bank. If that is the case, then inflation expectations may rise, making it harder for the monetary authority to fulfill its primary objective. In fact, as mentioned above, one of the main mechanisms through which exchange rate interventions operate is by signaling a monetary policy stance consistent with a more depreciated exchange rate. So under some circumstances, the monetary policy signals that the market reads might conflict with the inflation objective.

The experience of Chile during 2008 and 2011 shows some of these tensions. As mentioned before, right after the last two interventions there were some increases in expected inflation. In the first episode, that occurred in a context of already high inflation. Then the Central Bank had to respond by increasing the policy rate. In the second episode, inflation was around target, and the short-lived

increase in inflation expectations did not materialize as higher inflation. Thus, the monetary policy did not differ from its pre-intervention expected path. Pincheira (2013) formally tests whether these increases in inflation expectations were related to the interventions. For the 2008 episode he finds evidence of Granger causality between the amount of accumulated reserves and the distribution of inflation expectations at long horizons (one and two years ahead). Nevertheless, this causality is quantitatively moderate. Also, it seems to have had a relatively short memory, as the distribution of inflation expectations moved back to its initial position about six months after the intervention was announced. Moreover, it is not possible to distinguish whether the increase in inflation expectations was due to a change in the expected path of the monetary policy (the signaling channel) or whether there was a de-anchoring of inflation expectations for a given expected path of monetary policy.

Other recent experiences show that foreign currency market interventions may be uncontradictory with the monetary objective, and may, rather, complement monetary policy. Such is the case of Japan over the last years, and also the case of Switzerland. These economies were experiencing weak activity and had reached the zero lower bound for their monetary policy interest rate. Thus, the exchange rate intervention in their cases has been a non-conventional policy intended to foster their external demand.

It is important to note that the impact of a foreign exchange intervention on inflation – either current or expected – need not be associated with its impact on the exchange rate. Indeed, if there is a genuine misalignment of the real exchange rate, foreign exchange intervention may have an impact on the nominal exchange rate (via the information channel) without a direct effect on the inflation rate. However, it is always difficult ex ante to assess the speculative forces in the foreign exchange market, and hence the degree of misalignment of the real exchange rate.

VII.Summary and conclusion

Chile has conducted its monetary policy under an inflation targeting regime for more than twenty years. Initially, this policy framework was complemented by a target zone for the exchange rate. During this period, the central bank actively intervened in the exchange market and accumulated a large amount of international reserves. In spite of this, the real exchange rate exhibited an appreciating trend for several years, and the current account deteriorated significantly until the Asian crisis. With the adoption of the full-blown version of the inflation targeting regime by the end of 1999, the target zone for the exchange rate was abandoned and the Central Bank allowed the exchange rate to float freely. However – and despite not having an objective for the exchange rate – it did intervene on a few occasions during this period.

The last two interventions occurred in 2008 and 2011. The objective of these interventions was to accumulate reserves as a self-insurance device, and to curb excessive exchange rate fluctuations at a time when the currency was deemed to be overvalued with respect to its long-term equilibrium. The two interventions shared the same strategy. On both occasions a program of foreign exchange buys was pre-announced, specifying the amount to be bought and the length of the program. Neither of these programs was made conditional on the evolution of the exchange

rate, as a way of signaling the commitment of the Central Bank to the floating regime.

The first program was suspended before completion, in reaction to the Lehman Brothers collapse in September 2008. However, the second program was carried on until its end. In all, the two programs allowed the Central Bank to accumulate more than US 17 billion, or around 5.5% of GDP, in foreign reserves. As to their impact on the currency, the evidence is not clear cut. After the intervention of 2008 there was a major depreciation of the currency. However, this depreciation occurred at a time when financial tensions in the world were escalating, Chile's terms of trade were deteriorating and inflation was rising. Therefore, it is not clear how much of the depreciation can be attributed to the intervention. In any case, part of the impact of the intervention could be related to the signaling channel with the consequent impact on expected inflation. Also, the intervention may have acted as a coordination device to market participants, allowing the exchange rate to be more aligned with its fundamentals.

In the second program, there was only a short-lived depreciation of the exchange rate. The small effect of this intervention on the value of the currency could be the consequence of the intervention strategy, and of the fact that it occurred at a moment when Chile exhibited a deep financial integration with the rest of the world, as well as a low risk premium. It could also reflect the currency's being not far from its equilibrium value.

The benefits of these interventions in terms of accumulating reserves for self-insurance and – partially – in terms of smoothing exchange rate fluctuations have to be weighed against their costs. The most obvious cost of intervention is the negative carry of reserves. Before the last two interventions the balance sheet position of the Central Bank of Chile was already weak. With the amount of reserves accumulated over the past years, the balance sheet mismatch has increased, and the cost of carrying reserves has amplified the negative profits of the Central Bank. Another possible cost of exchange rate interventions is that they may generate moral hazard problems. If an intervention succeeds in ameliorating exchange rate volatility, it may induce more risk-taking by the private sector and enhance balance-sheet mismatches. The evidence of the impact of the last two interventions in terms of the exchange rate's volatility is not clear; therefore it is not obvious that these interventions introduced the wrong incentive to the private sector. Lastly, one of the major costs of interventions is that they may contradict other policies of the central bank. In the case of Chile, the episode of 2008 clearly shows tensions of that type. During that period, inflation was high, and the intervention program triggered an increase in inflation expectations with the consequent negative trade-off for the Central Bank. Other experiences around the world show that under certain circumstances it is possible for an intervention not to contradict another policy objective of the central bank.

References

Archer, D (2005), "Foreign exchange market intervention: methods and tactics", BIS Papers, no. 24.

BIS Report (2013), "The Effects of intraday FX market operations in Latin America: Results for Chile, Colombia, Mexico and Peru", forthcoming.

Combes, Kinda and Plane (2011), "Capital Flows, Exchange Rate Flexibility, and the Real Exchange Rate", IMF Working Paper 11/9.

Cowan, K., E. Hansen and L. O. Herrera (2005), "Currency Mismatches in Non-Financial Firms in Chile," *Economía Chilena* 8(2):57–82.

De Gregorio, J. and A. Tokman (2005), "Flexible Exchange rate regime and forex intervention", BIS Papers, no. 24, May, 127–138.

De Gregorio, J. (2011), "Acumulación de Reservas Internacionales en Economías Emergentes" Documentos Política Económica 40, Central Bank of Chile.

Disyatat, P. and G. Galati (2005) "The effectiveness of foreign exchange intervention in emerging market countries", BIS Papers, no. 24.

Doroodian, K and T. Caporale (2001), "Central Bank Intervention and Foreign Exchange Volatility", *International Advances in Economic Research* (7) 4.

Kamil, H (2012), "How Do Exchange Rate Regimes Affect Firms' Incentives to Hedge Currency Risk? Micro Evidence for Latin America", IMF Working Paper 12/69.

Pincheira, P. (2013), "Exchange Rate Interventions and Inflation Expectations in an Inflation Targeting Economy", manuscript, Central Bank of Chile.

Restrepo, J., L. Salomó and R. Valdés (2009), "Macroeconomía, Política Monetaria y Patrimonio del Banco Central de Chile", *Economía Chilena* 12(1):5–38.

Soto, C. and R. Valdés (1999), "Exchange Rate Volatility and Risk-Premium", Central Bank of Chile Working Paper 46.

Tapia, M., and A. Tokman (2004), "Effects of foreign exchange information under public information: the Chilean case", *Economía* 4, spring, 215–256.

Taylor, M. and H. Allen (1992), "The use of technical analysis in the foreign market", *Journal of International Money and Finance*, 11(3): 304–14.