Some lessons from Inflation Targeting in Chile[1]/

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1. It is my pleasure to be here at the annual monetary policy conference of Bank Negara Malaysia to discuss the experience of the Central Bank of Chile with Inflation Targeting (IT), especially over the recent decade since the global financial crisis (GFC). The experience of Chile is that of a small open economy far from the financial crisis but very much engaged in the swings of global commodity prices, capital flows and global monetary policy spillovers.

2. Although an Inflation Targeting (IT) framework was partially adopted in 1990, it was not until 1999, after the Asian financial crisis, that the Bank dropped the exchange rate band entirely and embraced full-fledged capital account liberalization. The rationale for this change was quite simple: the costs of defending the peso were too high in the early 2000s.

3. Thereafter, the exchange rate has floated freely and the central bank manages a short-term interest rate. In essence, the monetary policy framework in Chile is a very standard Inflation Targeting regime. Overall, the evaluation is quite positive. In the last 18 years, inflation has been low, output growth has been 4.1% on average, and no financial crisis or important financial stress has taken place. Of course, the monetary policy regime is not the sole determinant of these records, but it has clearly contributed to Chile's macroeconomic performance.

4. Today I want to share with you lessons on three dimensions: (i) on inflation volatility, (ii) on the meaning of monetary policy independence, and (iii) on financial stability considerations for monetary policy management.

1. <u>On inflation volatility</u>

5. The inflation objective in Chile is 3%, and the monetary policy rate is set to achieve an inflation projection of 3% in a two-year horizon. In this respect, the Central Bank has been quite successful in achieving price stability: since January 2000 the average headline inflation rate has been 3.3% (and 2.6% a measure of core inflation, CPIEFE). (**Figure 1**).

6. But the inflation objective also establishes that the Central Bank aims at keeping inflation "most of the time" within the 2%-4% target range.[2]/ This range was set under the assumption that the distribution of shocks facing Chile's economy was such that inflation would be within this range most of the time. While annual inflation was indeed between 2% and 4% in more months than not during the great moderation period, but since the Global Final Crisis inflation has actually been outside the range almost 60% of the time. (**Table 1**).

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[2] Central Bank of Chile, 2007. *Central Bank of Chile: Monetary Policy in an Inflation Targeting Framework*.

7. There are several reasons behind this. Our analysis points to the nature of shocks that Chile – and other emerging market economies – have faced in the last 10 years. Either due to a wider distribution function or an extraordinary realization of shocks, the fact of the matter is that large swings in commodity prices and monetary policy spillovers from advanced countries have generated more volatility in inflation. (**Figure 2**).

8. High volatility of inflation is a challenge to the Inflation Targeting regime. It requires strong communication with the markets to justify these deviations from the range, and this is especially important for countries with only a few decades of low inflation. Moreover, the ability to support these deviations requires a strict control of medium term inflation expectations. The Central Bank of Chile is very careful in making sure that 2-year inflation expectations remain anchored at 3% at all times. (**Figure 3**).

9. The fundamental challenge arises because an optimal monetary policy might require large and sometimes quite persistent deviations from 3% in order to allow for a better adjustment of output and employment to shocks. In a context of large and persistent external shocks, a monetary policy that limits major deviations of inflation from 3% runs the risk of becoming too pro-cyclical.

10. The dynamics of inflation reflects both the nature of shocks and the workings of the exchange rate system. In particular, a monetary policy framework that facilitates relative price adjustments through exchange rate flexibility could generate large deviations of inflation from the target. In simple words, if the drivers of real exchange rate fluctuations are persistent, so will be the deviation of inflation.

11. This tradeoff has manifested itself quite clearly in the last ten years, with a period of high growth and real exchange rate appreciation between 2010 and 2013 and a period of low growth and weak currency since 2014. With a medium term inflation perspective in mind, the Central Bank did allow inflation to undershoot in the booming period and to overshoot in the last few years. This strategy has contributed to stabilizing the output gap and employment at the cost of higher volatility of inflation (**Figure 4**). To the extent that there is delivery in the commitment to bringing inflation down to 3% in two years, this is a healthier macroeconomic adjustment. For this, a very consistent management of monetary policy is required over time. The alternative framework of targeting the exchange rate one way or the other has proven very costly in the past in Chile.

2. <u>On Monetary Policy Independence</u>

12. A second dimension is related to monetary policy independence. The ability to set short term interest rates is a fairly narrow definition of monetary policy independence, which does not take fully into account recent trends in financial globalization.[3]/ In the last decade, we have seen a significant and rapid impact of monetary policy in advanced countries.

[3] See Rey (2015), "Dilemma not Trilemma: The Global Financial Cycle and Monetary Policy Independence." NBER Working Papers 21162.

13. Monetary and financial conditions are not exclusively determined by short term interest rates. Long-term rates are of first-order relevance for evaluating the stance of monetary conditions, and they not only depend upon the expectation of future short term rates but also on the term premium, that represents the extra yield required by investors to hold a more-risky long term bonds.[4]/ Since the GFC, and in particular in response to extraordinary monetary stimulus in advanced economies, the term premium implicit in long-term yields has varied significantly, affecting long term rates everywhere.

14. In Chile, long-term financing through foreign and domestic markets for corporate bonds, government bonds and mortgages is very important. In some sense, the determination of long term yields is increasingly out of the reach of domestic monetary policy.

15. Here, we should distinguish two main issues. The first one flows from the secular downward trend in long term interest rates. This probably reflects both a fall in neutral real interest rates and also, especially since the Global Financial Crisis, a fall in the term premium in response to extraordinary monetary policy expansion in developed markets. Naturally, both forces induced a downward pressure in long term rates in Chile, but with different consequences.

16. The fall in neutral real rates requires a calibration of the monetary policy stance that has become particularly challenging. Alternatively, a fall in long term rates as a consequence of asset purchases and a fall in the term premium represent an ease in financial conditions that is not captured by the short term interest rate. Traditionally, the slope of the yield curve – say the 10/2 year rate spread – has been considered a good measure of the monetary policy stance. Implicit in this characterization is the idea that the slope of the yield curve is indeed a good representation of the gap between the short term rate and the neutral rate. In the last few years, the significant flattening of the yield curve has not reflected a less expansionary monetary policy stance but rather the opposite. The inflation targeting regime – and our models – are not fully prepared to incorporate these dynamics in a comprehensive manner.

17. A different but related issue follows from the short term swings in the term premium and their impact on asset prices and financial conditions in emerging markets. Because of the impossibility of being insulated from these shocks, in our experience the capacity of the exchange rate to absorb these movements is critical for keeping domestic financial conditions stable. Also, as long as these swings are short lived, their impact on inflation is secondary. We

[4] This has spurred research aimed at understanding the origin and determinants of these premia, and how monetary policy influences long rates. An excellent survey can be found in Gürkaynak and Wright (2012), "Macroeconomics and the Term Structure." Journal of Economic Literature 50(2):331-367. In addition, recent empirical evidence shows a significant spillover effect of US policy shocks on short- and long-term yields for many countries. However, the transmission mechanism seems to be different for EMEs: in developed economies the effect is mainly due to movements in risk-neutral rates, while in EMEs it works through changes in term premia (see Albagli, E., L. Ceballos, S. Claro, and D. Romero, 2015. "Channels of US Monetary Policy Spillovers into International Bond Markets," Central Bank of Chile working paper 771). Additionally, these movements have had an impact on macroeconomic variables as well; producing higher unemployment, higher inflation, depreciation of local currencies, and drops in stock markets (see Albagli, E., D. Leiva-Leon, and D. Saravia, 2016. "U.S. Monetary Spillovers to Latin America: The Role of Long-Term Interest Rates." In E. Albagli, D. Saravia, and M. Woodford (ed.), Monetary Policy through Asset Markets: Lessons from Unconventional Measures and Implications for an Integrated World, Series on Central Banking, Analysis, and Economic Policies, 1(24): 285-307, Central Bank of Chile.)

do not know whether all these phenomena are related to the QE environment we have lived in, or whether this is a structural feature. The point is that monetary policy independence is restricted by the degree of spillovers from the rest of the world, and we do not fully understand this interaction.

3. On Financial Stability and Macroprudential Policies

18. As a final point, I would like to share a few words on the interaction between monetary policy and financial stability. Since the GFC, there has been significant interest in academic and policy circles regarding the use of macroprudential policies as a different set of instruments of monetary policy to achieve financial stability.

19. I would characterize the approach at the Central Bank of Chile in this matter in two ways: (i) we very much agree on the idea that promoting financial stability is at the core of Central Banking, and (ii) we have a healthy skepticism of the application of quantitative tools. This attitude does not come from a deep conceptual objection to the macroprudential idea, but rather from the pragmatism that policy makers should have when facing new types of policies whose scope and impact are only gradually becoming clearer.[5]/

20. The main risks to financial stability accumulate through the combination of appreciated asset prices and leverage and maturity transformation. In other words, the debt accumulated to finance assets whose prices are rising could pose a risk to financial stability inasmuch as the appreciation of assets and leverage does not obey to fundamental considerations.

21. Real–estate and housing provide the best example. The nature of the asset, which faces universal demand (we all need a home) and the obvious advantage that it can be used as collateral, results in upward and downward price trends that in most occasions are smooth and have lags. Therefore, upward price cycles are normally accompanied by upward cycles of credit flows. To the extent that it is difficult ex-ante to properly account for these risks in the asset's valuation, this mechanism may enter a feedback loop, generating vulnerabilities in the financial system. In that case, it comes as no surprise that a big price adjustment in real estate prices may cause significant damage to the financial system, which is creditor of these loans.

22. In other asset markets, however, it is the rapid adjustment in asset prices what prevents speculative flows and limits the creation of vulnerabilities. Although this is a hot topic, my view is that this is the case in forex markets. A rapid adjustment of currency values may hold back the buildup of excessive credit and debt flows, thus safeguarding financial stability. Why? Simply because often the flows are after not only the interest rate differential but also the capital gain associated with the expected price increase. Rapid price adjustments avoid the buildup of speculative positions.

[5] See Raddatz and Vergara (2016), "Macroprudential Policies: General Analysis and a Look into the Chilean Experience," Economic Policy Papers Central Bank of Chile 59 for a more detailed discussion.

23. The contrast I have made between housing and FX markets suggests that in some cases limits to asset price appreciation might contribute to avoid the accumulation of financial vulnerabilities. In other cases the opposite is required. Therefore, it is difficult to think that monetary policy – which roughly speaking affect valuation across asset markets – is a good instrument to deal with financial stability. Moreover, a credible flexible exchange rate framework constitutes itself a macro-prudential policy.

24. One consideration to keep in mind here is that monetary policy also affects asset price valuation through changes in risk taking. Then, the ability of monetary policy not only to affect the structure of risk-free rates—especially its short segment of the yield curve—but also to influence the structure of risk premiums gives it an even greater role in asset pricing. The extent to which central banks should incorporate these considerations in their monetary policy decisions is an open debate, but I think it will not fundamentally change the conclusion that instruments other than the interest rate are required to deal with financial stability.

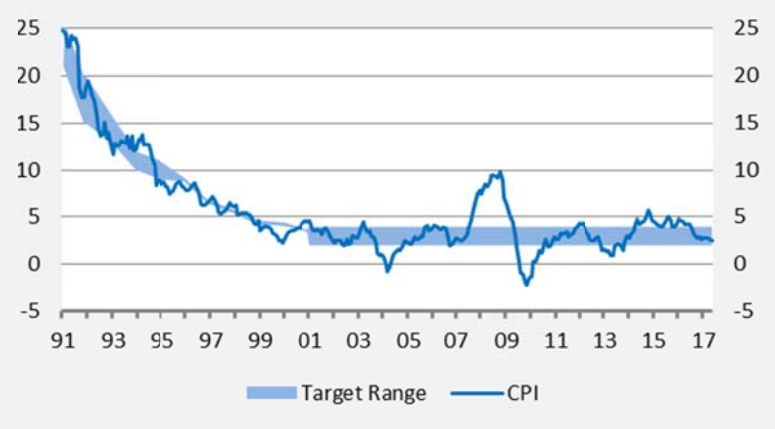
25. Tools which are market-specific – labeled macroprudential policies – might be helpful. The most obvious example are policies focused on housing and real estate, where limits to credit growth and loan to value might restrict leverage and asset price appreciation.

26. However, the general equilibrium effects of these policies are pretty unknown. In a context of high risk appetite, low world interest rates, and capital flows, limits to the growth in one sector might end up enhancing the valuations and leverage in other markets. To some extent, the current macroprudential debate lacks a fully general equilibrium framework, which explains my particular distance with the outright application of several measures that are discussed in many places.

27. Thank you.

Figures and Tables

Figure 1: CPI inflation and target range
(annual change, percent)



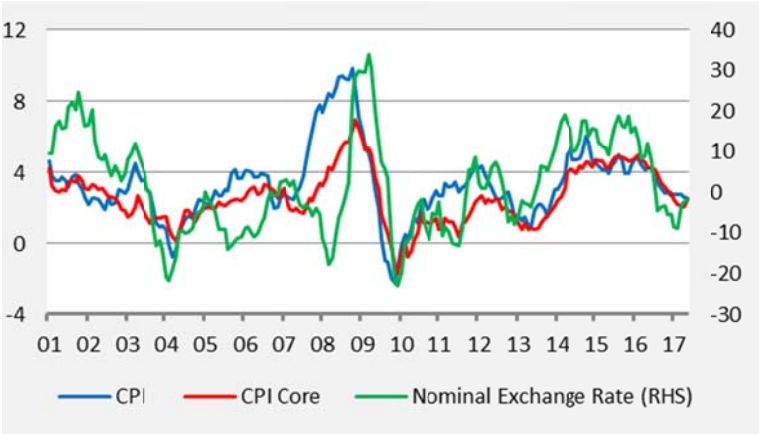
Sources: National Statistics Institute (INE); Central Bank of Chile.

Table 1: Fraction of months with annual CPI inflation within/out of target range
(percentages)

	January 2001 – May 2017	Until GFC (January 2001 – August 2008)	Since GFC (September 2008 – May 2017)
Within Range	52%	63%	43%
Out of Range	48%	37%	57%

Sources: INE; Central Bank of Chile.

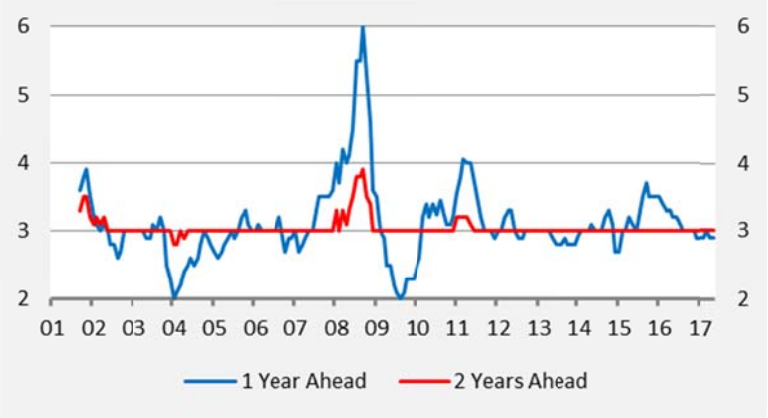
Figure 2: Inflation and nominal exchange rate (Chilean pesos/US dollar)
(annual changes, percent)



Note: CPI Core excludes food and energy prices. Source: INE, Central Bank of Chile.

Figure 3: Survey-based inflation expectations 1 and 2 years ahead

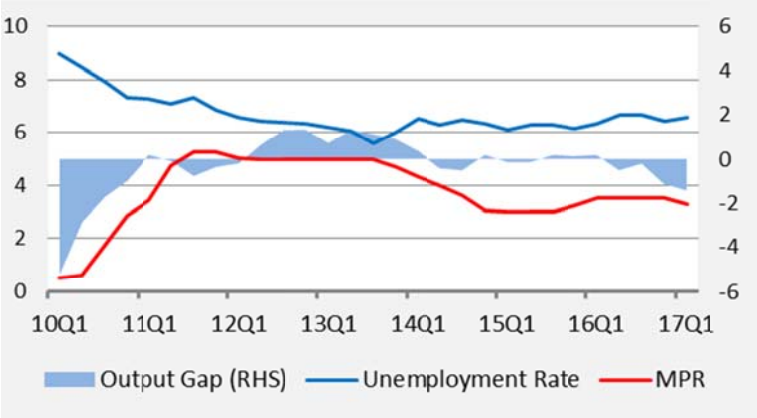
(annual changes, percent)



Source: Economic Expectations Survey, Central Bank of Chile.

Figure 4: Output gap, unemployment rate and monetary policy rate

(quarterly averages, percentages)



Sources: INE; Central Bank of Chile.