



# Management of Market Risks at the Central Bank of Chile

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November 2007



# Outline

- CBC´s management of market risks
- Currency composition of the Investment Portfolio
- Duration of the Investment Portfolio
- Concluding remarks



# CBC's management of market risks

- The priority of the CBC's management of its FX reserves market risks (currency and interest rate) is to reduce the volatility of the economic capital of the Bank.
- The CBC has negative capital of the order of 3% of GDP, with a net domestic debt (excluding the monetary base) that is almost as large as its net foreign currency assets.
- So far, this has not been a problem. Furthermore, the Government is capitalizing the Bank at a pace of 0.5% of GDP per year, under certain conditions.



# CBC's management of market risks

- However, an independent central bank needs a minimum capital. Otherwise, in extreme cases, the central bank may not be able to fulfill its duties:
  - The inflation target may become non credible.
  - The bank may not be able to act as lender of last resort.
  - The bank may not be able to intervene in the FX market if required under exceptional circumstances.
  - The bank may, de facto, lose its independence.
- Those scenarios are extreme and the CBC has been sufficiently far from there. We want this to continue to be the case.



# CBC's management of market risks

- Reducing market risk is the key goal only to a point:
  - Net FX position is a given (macroeconomic policy).
  - Liquidity matters (slight us dollar bias, only liquid instruments).
  - Legal constraints (money market and fixed income; no corporates).
- The investment policy also considers our inflation targeting regime and floating exchange rate.
- We allow some risk taking to add return, but, currently, exploiting the risk–return tradeoff is not part of the benchmark (it is delegated, within limits, to the manager).



# CBC's management of market risks

- For management purposes, foreign exchange reserves are invested in assets included in two main portfolios: the Investment Portfolio and the Liquidity Portfolio.
- The Liquidity Portfolio covers requirements foreseeable in the short term, mainly banks FX deposits. The currency and interest rate risks in this portfolio are managed on a tight ALM basis.
- The Investment Portfolio, the largest, includes short- and long-term foreign currency held to deal with contingent and long-term requirements.
- The following sections explain the management of currency and interest rate risks in the Investment portfolio.



# Currency composition of the Investment Portfolio

- To manage currency risk of the Investment Portfolio, we set a benchmark for its currency composition and allow the manager to take positions around the benchmark within a range.
- In order to determine the currency benchmark of the Investment Portfolio, two criteria are considered:
  - i. Minimizing the effect of currency risk on the volatility of the Bank's economic capital.
  - ii. The likely currency denomination of the potential liquidity needs in foreign exchange.



# Currency composition of the Investment Portfolio

## First criterion:

- Minimizing the effect of currency risk on the volatility of the Bank's economic capital is akin to minimizing the volatility of the Bank's net foreign currency assets measured in Chilean pesos.
- Assuming exchange rates are normally distributed and that non-arbitrage conditions hold, the optimal currency composition depends on the variances of the exchange rates for the currency pairs and their correlations.
- An examination of the behaviour of usd/clp and euro/clp rates according to historical and market data provides no strong reason to deviate from a 50%–50% composition, but does not oppose imposing somewhat asymmetric shares either.





# Currency composition of the Investment Portfolio

## Second criterion:

- Considers the currency denomination of potential needs of liquidity in foreign currency.
- Short term external debt by residual maturity (excluding trade credits) are mainly denominated in USD (90% in USD and the remaining 10% in Euros and other currencies).
- If the CBC wanted 100% certainty in meeting these potential liquidity needs, around 80% of the international reserves should be denominated in USD.



# Currency composition of the Investment Portfolio

- The current currency benchmark for the Investment Portfolio represents an intermediate solution: it calls for 60% to be held in US dollars and 40% in euros.
- 5% deviations above or below the benchmark are allowed.
- Aside from the US dollar and the euro, the Investment Portfolio includes investments in other internationally accepted currencies, including the sterling pound, the yen, the Canadian, Australian, New Zealand and Singapore dollars, the Swiss franc, the Swedish krona, and the Danish, and Norwegian kroner.



# Duration of the Investment Portfolio

- To manage interest rate risk of the Investment Portfolio, we set a benchmark for the duration of this portfolio and allow the manager to take positions around the benchmark within a range.
- We define the neutral duration of the Investment Portfolio as the duration that minimizes the risk for the balance sheet associated to changes in global interest rates.
- We estimate the neutral duration as the duration that makes the balance sheet's "duration gap" equal to zero; i.e., such that expected changes in the value of assets due to fluctuations in global interest rates are offset by similar expected changes in the value of the liabilities.



# Duration of the Investment Portfolio

- Calculating the neutral duration requires estimating or making an assumption regarding the relationship between foreign interest rates and local rates.
- We have estimated from the data “pass-through” coefficients for different type of instruments. We have found that, through the years, local interest rates in Chile have become more closely linked to global interest rates.
- Comparable to the practice in the asset management industry to assume that the duration of US TIPS is one half of the duration of an equivalent nominal US Treasury Bond.



# Duration of the Investment Portfolio

- During the 2006 (2005) annual revision of the guidelines for the Investment Portfolio, we estimated the neutral duration for the investment portfolio to be 13 months (14 months).
- In 2005 and 2006, we set the benchmark duration equal to the neutral duration, as longer durations did not seem to be providing higher expected returns.
- We allow the manager to increase the duration of the portfolio up to six month above the benchmark duration, or to reduce it to zero (practical deviations are much smaller).



# Concluding Remarks

- The priority of the management of market risks at the CBC is to reduce the volatility of the bank's economic capital, subject to macroeconomic policy, liquidity and legal constraints.
- Interest rate risk of the Investment Portfolio is currently managed by setting a benchmark duration which targets a zero duration gap for the overall balance sheet.
- Duration gap analysis is a standard ALM technique that has the virtue of simplicity, but it has limitations.
- In particular, it would be interesting to use a framework that allows for multivariate stochastic dynamic simulations of the balance sheet under alternative investment strategies.



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