High-Level Reserve Management Conference
Banco de México- BIS
Ciudad de México, March 2017

“Changes to the investment approach/process over the past couple of years and going forward”

CENTRAL BANK OF CHILE

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Agenda

1. Reserve Management Objectives
2. Evolution of the International Reserves
3. Strategic Asset Allocations (SAA) Approach
4. Investment Process
5. Final remarks

Reserve Management Objectives

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- International reserves are liquid assets in foreign currency held by the Central Bank of Chile (CBC).

- These instruments support the monetary and exchange rate policies in order to meet the Bank's objective of safeguarding currency stability and the normal functioning of domestic and external payments.

- Under Chile's current floating exchange rate regime, the main goal of holding reserves is to ensure access to liquidity in foreign currency, in order to allow intervention in this market under exceptional and well defined circumstances.

- The purpose of foreign exchange reserves management is to guarantee secure and efficient access to international liquidity and safeguard the Central Bank's net worth.

Reserve Management Objectives

- Accordingly, in order to establish the SAA, the CBC has defined the following objectives for its reserve management:

  ✓ Maintain **highly liquid assets** with low drawdown risk, to satisfy the criteria of **capital preservation** and readiness of foreign currency.

  ✓ Reduce the volatility of the Bank’s balance sheet (mismatches between assets and liabilities).

  ✓ **Reduce the cost** of holding reserves.

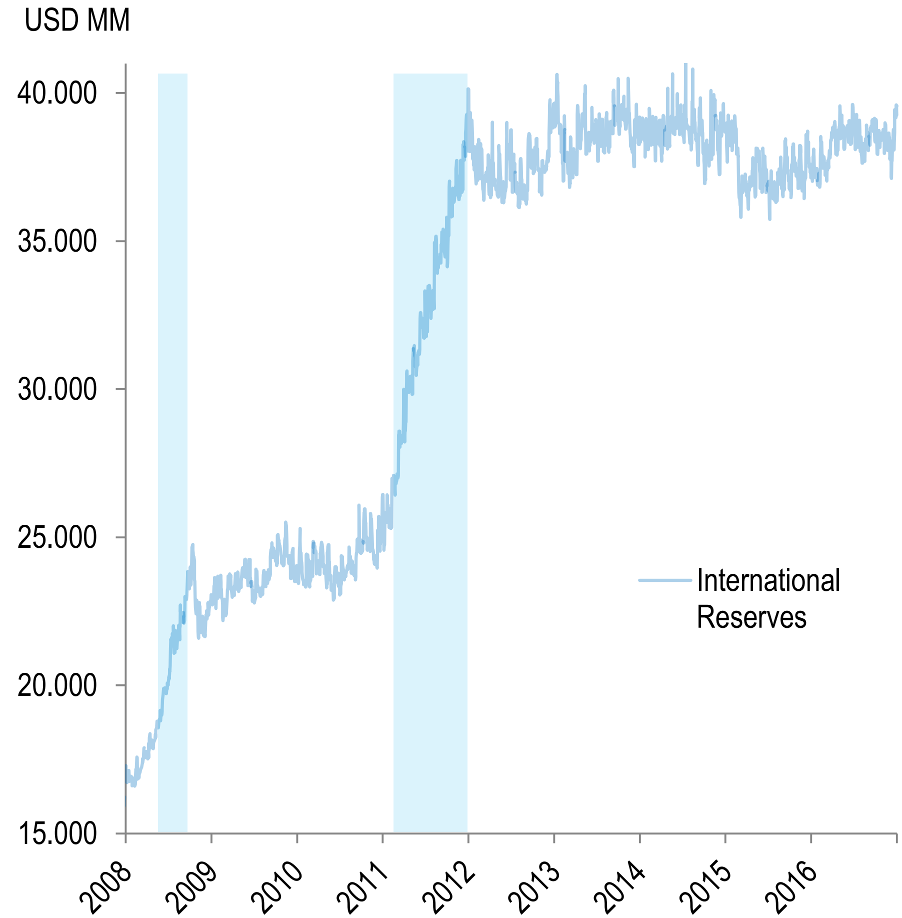
Evolution of the International Reserves

Evolution of the International Reserves

- Since the adoption of a floating exchange rate regime, the CBC has intervened four times.

- The major interventions were carried out in April 2008 (totaling US$5.75 billion) and January 2011, increasing international reserves by US$12 billion.

- Since 2012 (after the last intervention), the value of international reserves has fluctuated between US$36 and $41 billion.



Evolution of the International Reserves

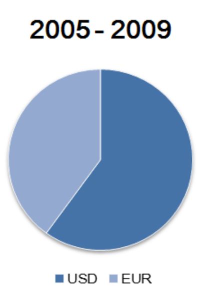
- The current interest rate environment is in part explained by the actions taken by the main central banks after the US subprime crises and the European debt crisis.

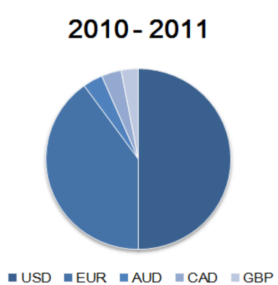
- During that period, the CBC adapted its benchmark composition to better meet the reserve management objectives: liquidity, capital preservation, balance-sheet hedging and diversification.

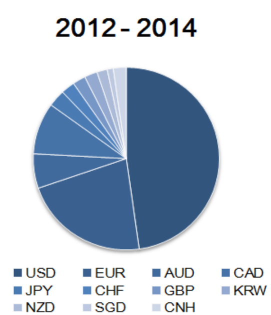
1. In terms of currencies the reserves has evolved to a more diversified composition: currently 10 currencies are considered in the benchmark.

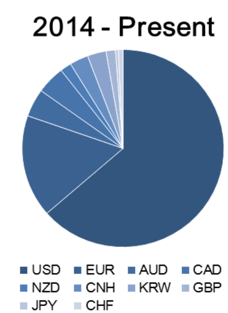
2. In term of credit risk , the bank risk was reduced from 40% to 3%.

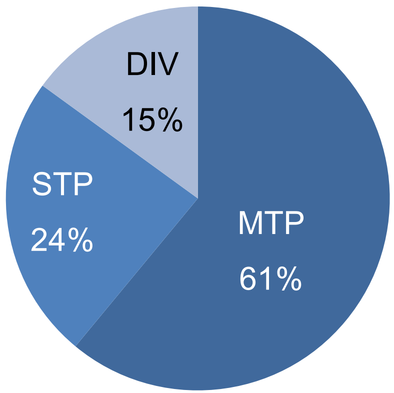
3. In terms of interest rate risk, the duration has been kept around 2 years.







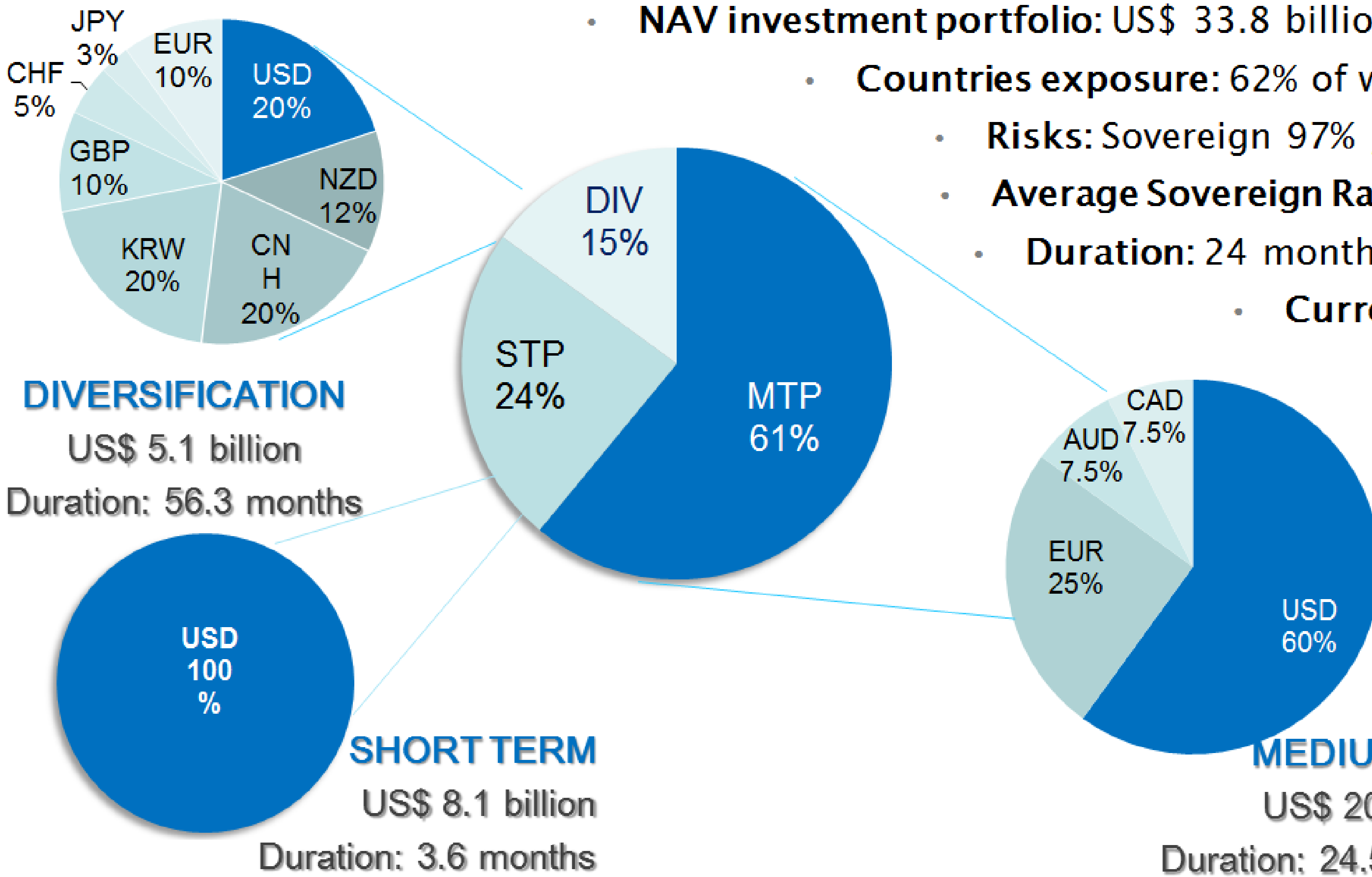




STP: Short Term Liquidity Portfolio
MTP:

Evolution of the International Reserves

- **NAV investment portfolio:** US$ 33.8 billion approx.
- **Countries exposure:** 62% of world GDP
- **Risks:** Sovereign 97% / Bank 3%
- **Average Sovereign Rating:** AAA
- **Duration:** 24 months approx.
- **Currencies:** 10



SAA Approach

SAA Approach

- Given the objectives of the management of international reserves, that the interest rate scenario has changed, and that the uncertainty in the fixed income markets remains relatively high, two questions must be answered in order to successfully face the current scenario and the future.

1) Is the strategic asset allocation for the international reserves sufficiently robust to face the different scenarios which might emerge? Are we reasonably meeting all the objectives of international reserves management in all future scenarios?

2) Is the organization of the investments area adequate in terms of structure and capacity when faced with a changing investment environment?

SAA Approach

- **CURRENT SITUATION:** Both quantitative and qualitative criteria are currently combined in the definition of the Strategic Asset Allocation of the Central Bank of Chile.

✓ The definition of minimum liquidity requirements: Three month import coverage or financial external short term residual debt coverage are used as references, which are in turn complemented by studies of the potential liquidity needs in the case of a sudden stop.

✓ The Central Bank's balance sheet coverage: In this case a classical minimum variance approach is used to obtain an asset composition which best replicates the behavior of the Bank's liabilities in terms of volatility (given the restrictions imposed by the current investment policy). With this approach we try to protect the Bank's equity.

✓ Search for returns: Based on a model that projects long term returns, an asset composition is sought which permits both the diversification of the reserves as well as the reduction of the negative carry on the bank's balance sheet.

SAA Approach

- **THE CHALLENGE**: Nonetheless, the following must be considered:

✓ Liquidity needs change over time, and the costs of maintaining liquidity when it is not strictly necessary can be relatively high.

✓ Mean-variance models, because they are based on historical data, may not be robust in the face of changing or extreme external scenarios.

✓ Returns projection models are hard to calibrate and may have biases, depending on the model which is used.

✓ The portfolio is optimized in different stages, considering each of the objectives in a sequential manner. This may result in a final portfolio solution which can deviate from the global optimum.

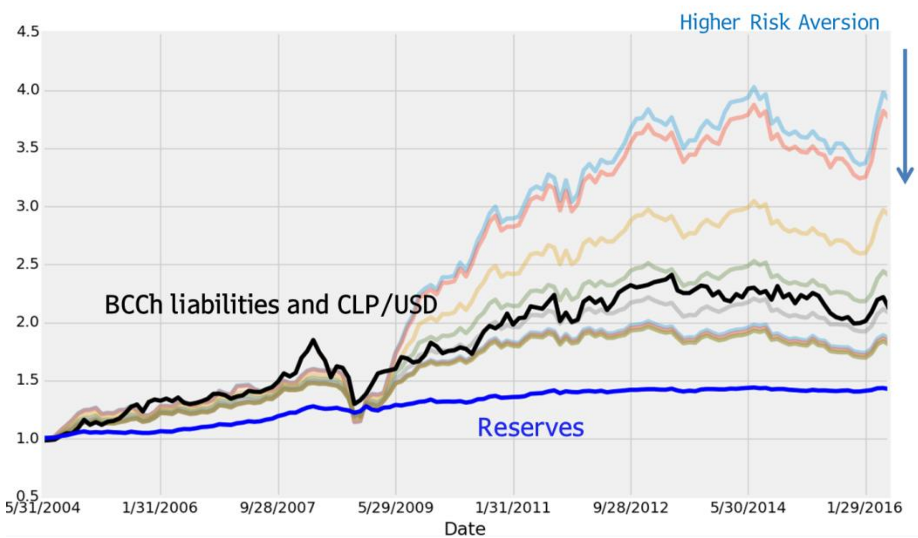
- Given the above, thought is being given to changing to a more holistic approach.

SAA Approach

- Looking forward, the goal is to match in a more appropriate and efficient manner the required risk and return profile of the liabilities by taking on exposure to global systemic risk factors and risk premia, while keeping an adequate level of liquidity.

- The methodology has to be robust enough in order to perform well under different economic scenarios, including the eventual normalization of interest rates and increasing volatility.

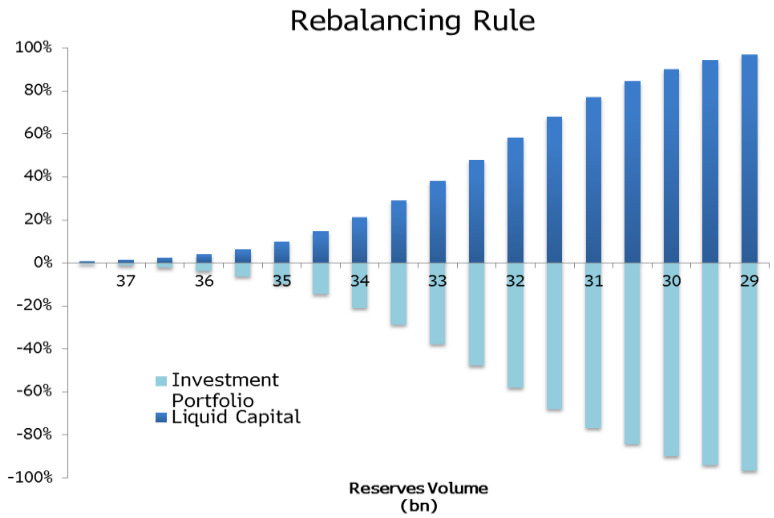
- **NEW APPROACH:** It is based on a model which depends on risk factors combined with a “synthetic put”. This allows for better coverage of the bank’s liabilities, ensuring minimum liquidity at all moments in time.

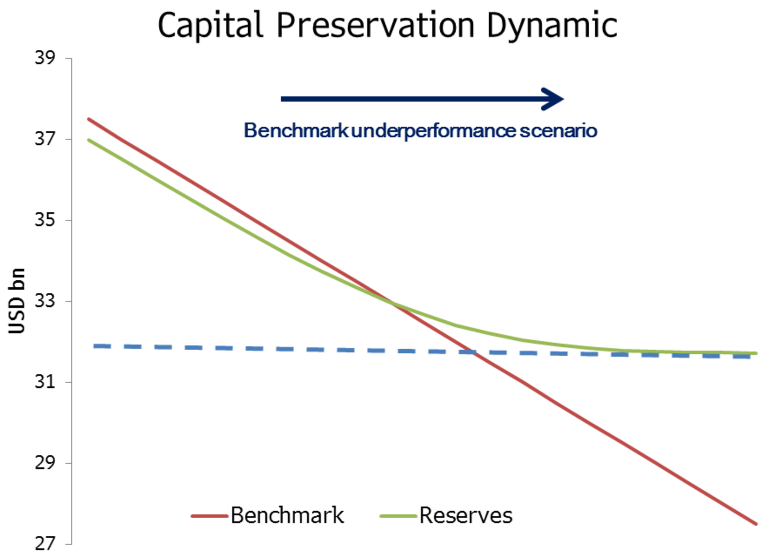


SAA Approach

Limiting drawdown risks

Also, given an increase of risk exposure, dynamic insurance strategies are being analyzed to fulfill the capital preservation requirements for the international reserves. In other words, the idea is to limit drawdown risks to ensure that a minimum level reserves are kept at any point in time.





The contingent strategy is based on dynamically rebalancing the reserves between a risky invested portfolio and a risk free asset, based on the idea of a synthetic Put Option.

Investment Process

Investment Process

- The International Markets Area had, up until 2016, two departments. Their principal functions were:

✓ Fiscal Agency Department: In charge of managing the sovereign wealth funds (Reserve Pension Fund and the Economic and Social Stabilization Fund) and of maintaining the relationship with the Ministry of Finance, the Treasury and the Custodian Bank.

✓ International Trading Desk: In charge of managing the International Reserves and the trading desk, including the execution of operations for both the reserves and the Fiscal Agency.

- This structure had a “final client” focus (Ministry of Finance and the Board of the Bank). Although this approach functioned well, a more efficient organizational structure was implemented.

Investment process

- At the end of 2016 the International Markets Area was restructured. The objective was to implement a process based approach (as opposed to a client or product based approach) with the goal of increasing operational efficiency.

- Today the International Markets Area is divided into three departments:

  - ✓ **Investment Strategy Department:** proposes the investment guidelines and policies that define the Strategic Asset Allocation (SAA) for international reserves, designs and manages the Tactical Asset Allocation (TAA) for international reserves and SWFs.

  - ✓ **International Trading Desk Department:** implements the TAA for each portfolio.

  - ✓ **Fiscal Agency Department:** manages the domestic and foreign relationships related to SWFs (Treasury, Ministry of Finance, custodians, among others).

Investment Process

- This new structure creates greater efficiency through more specialization.

✓ In the trading area: Improvement of operation execution times, broader counterparty coverage, better day to day market coverage, improvement of access to counterparty inventories, better auction participation, greater capacity to generate and analyze trade ideas.

✓ Portfolio Management: Dedicated portfolio management team allows for a more detailed analysis of economies in which there are investments. The combination of economic/financial professionals with quantitative specialists creates a more robust and holistic approach for the definition of investment strategies.

✓ Fiscal Agency: More complete coverage to the Ministry of Finance, with faster response times and greater analytical capacity.

Final Remarks

Final Remarks

- It is not clear when and how the global conditions will shift.

- The challenge is to manage this by having a robust Strategic Asset Allocation framework to better achieve the objectives set for the management of international reserve.

- On the other hand, it is important to have an organizational structure that facilitates the specialization of duties in order to have quick access to the markets and ensure the leadership can manage talented and diverse professionals in charge of managing different types of portfolios under different environments.

- Also, it is key to have a robust framework in the definition of the Tactical Asset Allocation, in order to provide consistent returns over time while minimizing the exposure to extreme (undesirable) events.

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