XII BIS – CEMLA Roundtable, this time on: Reserve Management and FX Intervention

Manuel Ramos-Francia, Director General, CEMLA
Cartagena de Indias, Colombia
June 17 and 18, 2019
Session III – Reserve management
A naïve way of approaching Reserve Management is seeing it purely as a Portfolio Selection problem (à la Markowitz, 1952) for a central bank.

There are, at least, three levels at which reserve managers should understand their role.

- **First**, plainly, they might need to consider the whole bank’s balance sheet.

- **Second**, they need to ponder the government aggregate portfolios. This is akin to Sargent and Wallace’s (1981) result for the government aggregate budget constraint.

- **Third**, they also need to think of the international reserves in terms of the local and global economies, e.g., sources of income, sensibilities, global risk factors, AEs’ economic policies, and even policies implemented by EMEs, among others.
To see some key implications, consider the following simplified portfolio selection problem (e.g., see Cochrane, 2007).

The central bank expects to obtain $e + p$ tomorrow, as it has an endowment (i.e., income) $e$, and portfolio $p$. It also has wealth $W$ today.

The manager maximizes $\mathbb{E}_t(u(e + p))$ s.t. $\mathbb{E}_t(mp) = W$, where $m$ is the pricing factor.

Optimality conditions are $u'(e_s + p_s) = \lambda m_s$, where $\lambda$ is a Lagrange multiplier.

In this context, $m_s$ reflects the price of a contingent claim. In effect, a large (small) price, i.e., insurance premium, implies a lower (higher) coverage.
Thus, it is useful to consider the endowment $e$ as capturing the bank’s liabilities, government net resources or the economy’s sources of net income. Importantly, $e$ is exogenous (to the manager) in most cases.

Again, we have $u'(e_s + p_s) = \lambda m_s$, where $m_s$ reflects its price; i.e., the SDF.

Consider $p_s = (\lambda m_s)^{-1} - e$ where $u(x) = \ln x$. A greater (smaller) price $m_s$ or endowment $e$, leads to a smaller (greater) portfolio position, $p_s$. In effect, one would like to be covered, particularly so, against bad states.

The shadow price (i.e., the marginal utility given an increase in wealth) $\lambda$ acts, on average, as $m_s$. It provides a balance of different motivations.
Reserve management is a multi-factor problem.

The common paradigm is a return-risk balance. More generally, managers should balance the performance of their portfolio in terms of factors they care more about and markets compensate for.

A manager could consider:

- An adequate risk-return balance.
- Other factors; typically that reserves do relatively well during bad times.

Importantly, a reserve manager needs to balance such factors considering their feasibility.

- While a good performance during bad times is desirable; in equilibrium, someone would need to be in the counterpart position, which is unlikely. In addition, if such an asset would exist, in equilibrium, its expected return would be relatively low.
EMEs central banks have started considering a broader universe of financial assets.
- Due to lower level of interest rates in AEs.
- Seeking diversification, but possibly leading to new trade-offs as their investment sets expand.

Return performance has gained relevance, partly given an increase in costs.

Return measurement naturally depends on the reserve currency. Thus, as returns are typically measured in USD, asset allocation naturally tilts to such a currency.

Liquidity and investments portfolios. One focuses on availability; the other one on returns.
World Currency Composition of Official Foreign Exchange Reserves

Relative World Currency Composition of Official Foreign Exchange Reserves

Notes: In millions of USD. Source: IFS- IMF

Source: IFS- IMF
Reserve Management

Emerging and Developing Economies Currency Composition of Official Foreign Exchange Reserves

Notes: In millions of USD. Starting 2015Q2, the breakdown for emerging and developing economies is no longer available. Source: IFS-IMF

Relative Emerging and Developing Economies Currency Composition of Official Foreign Exchange Reserves

Note: Starting 2015Q2, the breakdown for emerging and developing economies is no longer available. Source: IFS-IMF
Long investment horizons allow managers to exploit return and volatility predictability.

- As known, such predictability appears to be related to business cycle frequencies. Thus, being able to invest considering longer horizon than typically is favorable.
- Having said that, they should and do consider a portion of the reserves that has as its main consideration liquidity.

Portfolio allocation outsourcing

- Portfolio managers follow a very well-defined index.
- Control is generally of little concern.
- A gain of the expertise of private investors.
EMEs’ spillovers in international financial markets
- Similar risk management and asset allocation tools in central banks can lead to portfolio co-movements. Procyclicality.
- Given the size of the international reserves, is there a possibility of possible spillovers?
- This is akin to the possibility of the spillovers that GAM companies in EMEs might create.

Reserve valuations and sharing-rules.
- Central bank- and economy-dependent.
- Implications for reserve management.

Communication policy.
- Is there a level of optimal disclosure?
- There is, of course, the possibility of political economy costs.
Final Remarks

1. Reserve managers need to account for a plethora of elements compared to an ordinary portfolio problem.

2. For the most part, the selected portfolio returns distribution should be in line with their objectives; one of them is, prominently, self-insurance.

3. International reserves managers have some advantages in terms of the financial asset access, long investment horizons, and expertise they have.

4. Additional elements should be considered, such as political economy cost.

5. All in all, international reserves and FX interventions are very relevant components of the scaffolding of the policy edifice.
1. **Aizenman, J, M Chinn and H Ito (2014)**: “International reserves before and after the global financial crisis: is there no end to hoarding?”, NBER Working Papers, no 20386.


7. **Chamon, Hofman, Magud, and Werner (2019)**. *Foreign Exchange Intervention in Inflation Targeters in Latin America*. International Monetary Fund.


References


