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

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Session III – Reserve management

Reserve Management I

1. A naïve way of approaching Reserve Management is seeing it purely as a Portfolio Selection problem (à la Markowitz, 1952) for a central bank.

2. 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.

Reserve Management II

1. To see some key implications, consider the following simplified **portfolio selection problem** (e.g., see Cochrane, 2007).

2. 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.

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

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

5. 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.

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Reserve Management III

1. 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.

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

4. Consider $p_s = (\lambda m_s)^{-1} - e$ where $u(x) = \ln x$. A greater (smaller) price m 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.**

5. The shadow price (i.e., the marginal utility given an increase in wealth) λ acts, on average, as m_s. It provides a balance of different motivations.
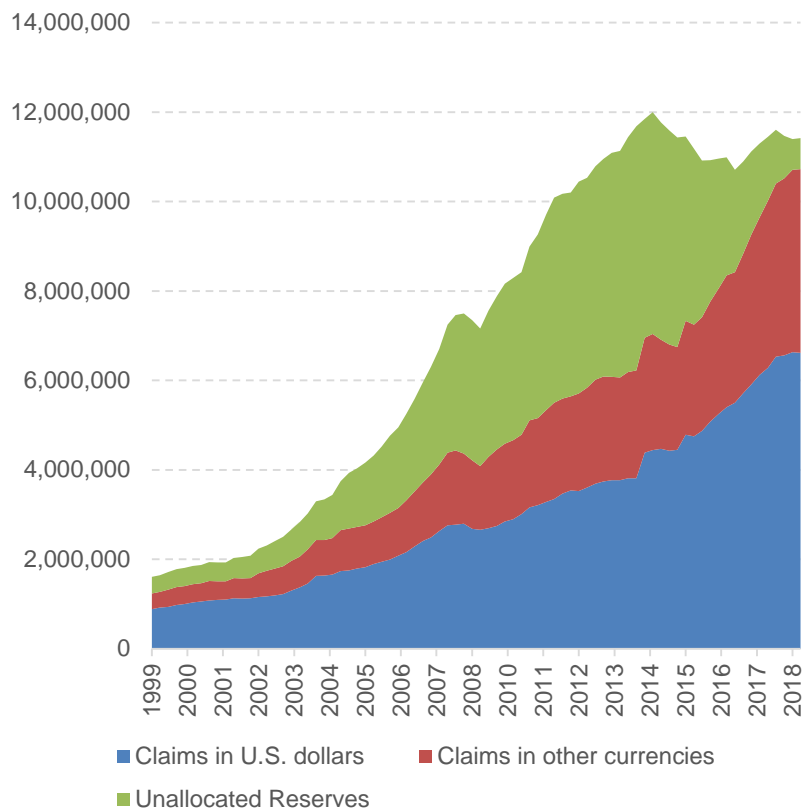
Reserve Management IV

1. Reserve management is a multi-factor problem.

2. 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.

3. A manager could consider:

   ➢ An adequate risk-return balance.

   ➢ Other factors; typically that reserves do *relatively* well during bad times.

4. 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.

Reserve Management V

1. 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.

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

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

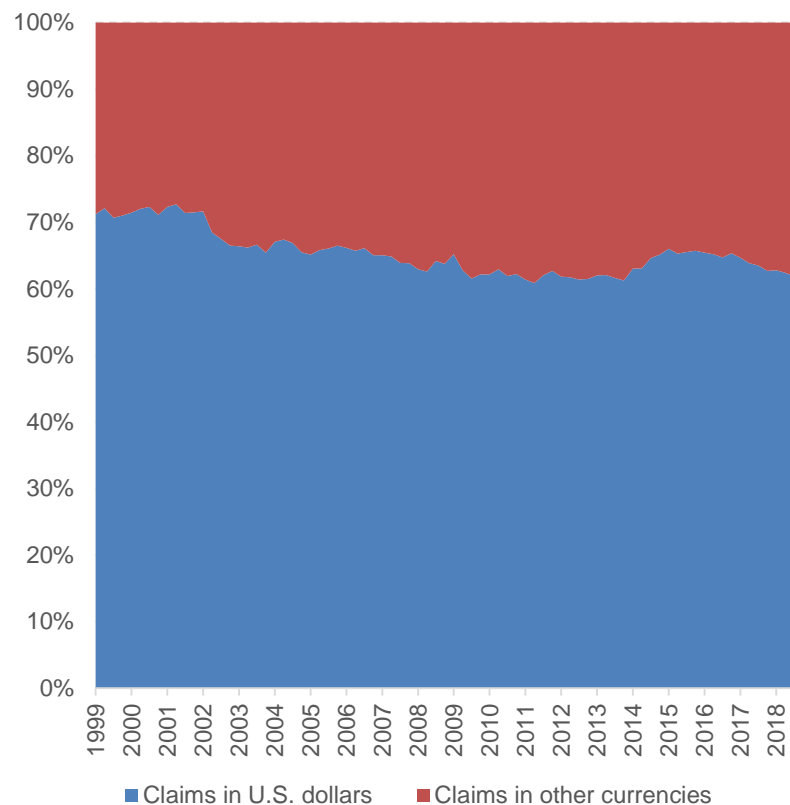4. Liquidity and investments portfolios. One focuses on availability; the other one on returns.

Reserve Management

World Currency Composition of Official Foreign Exchange Reserves

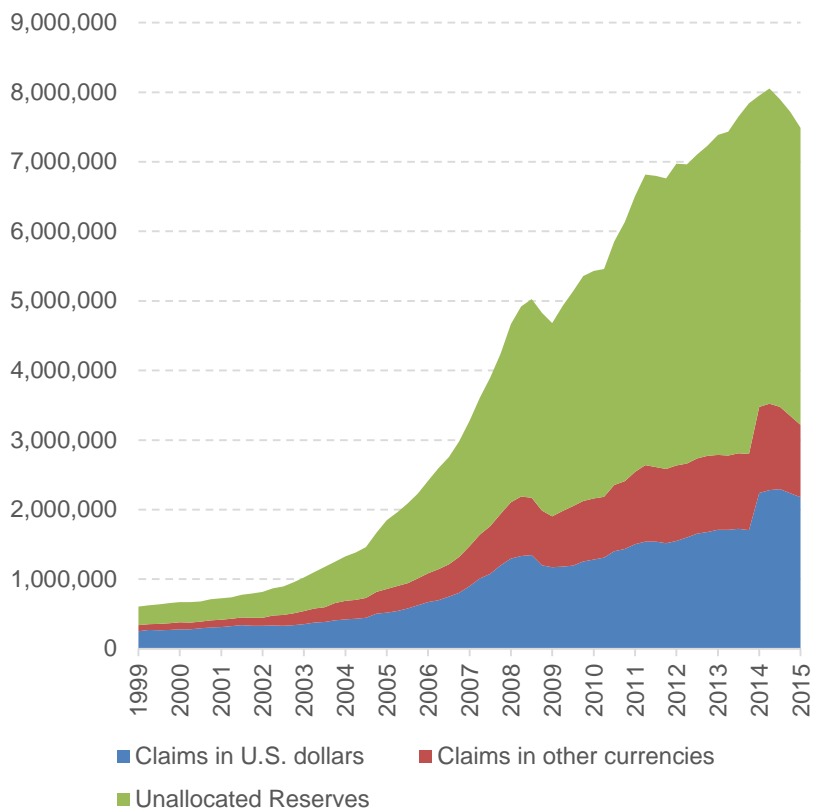**Notes:** In millions of USD. **Source**: IFS- IMF

Relative World Currency Composition of Official Foreign Exchange Reserves
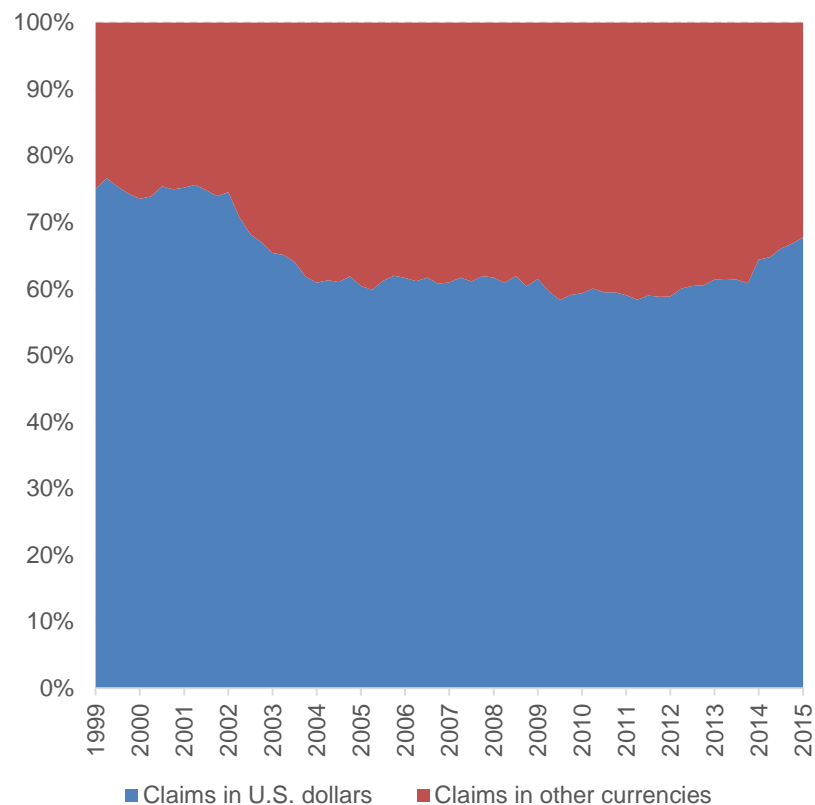

Source: IFS- IMF

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Reserve Management

Emerging and Developing Economies Currency Composition of Official Foreign Exchange Reserves

Relative 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

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Reserve Management VI

5 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.

6 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.

Reserve Management VII

❼ 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.

❽ Reserve valuations and sharing-rules.

  ➢ Central bank- and economy-dependent.

  ➢ Implications for reserve management.

❾ Communication policy.

  ➢ Is there a level of optimal disclosure?

  ➢ There is, of course, the possibility of political economy costs.

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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.

References

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.
2. **Archer, D and P Moser-Boehm (2013):** "Central bank finances", BIS Papers, no 71, April.
3. **Blanchard, O and G Adler (2015):** "Can foreign exchange intervention stem exchange rate pressures from global capital flow shocks?", NBER Working Papers, no 21427.
4. **Calvo, Izquierdo, and Mejia (2003)**. On the empirics of Sudden Stops: The Tele ON THE EMPIRICS OF SUDDEN STOPS: THE RELEVANCE OF BALANCE-SHEET EFFECTS. Nber Working Paper.
5. **Cano, Gallardo, and Acosta (2019).** Mexico: Free-Floating Exchange Regime. *Foreign Exchange Intervention in Inflation Targeters in Latin America*, 97.
6. **Chaboud, Chiquoine, Hjalmarsson, and Vega (2014).** Rise of the machines: Algorithmic trading in the foreign exchange market. *The Journal of Finance*, *69*(5), 2045-2084.
7. **Chamon, Hofman, Magud, and Werner (2019).** *Foreign Exchange Intervention in Inflation Targeters in Latin America*. International Monetary Fund.
8. **Cochrane (2007).** Portfolio Theory. Unpublished Book Chapter.
9. **Fatum, Liu, Tong and Xu (2018).** Beggar thy neighbor or beggar thy domestic firms? Evidence from 2000 to 2011 Chinese customs data. *Journal of International Economics*, *115*, 16-29.
10. **Ramos-Francia and García-Verdú (2014).** Interventions and expected exchange rates in emerging market economies. *The Quarterly Journal of Finance*, *4*(01), 1450002.
11. **Holston, Laubach, and Williams (2017).** "Measuring the natural rate of interest: International trends and determinants." *Journal of International Economics*, *108*, S59-S75.
12. **Humpage (1986).** Exchange-market intervention: the channels of influence. *Economic Review*, (Q III), 2-13.

References

13. **Laubach and Williams (2003).** "Measuring the natural rate of interest." *Review of Economics and Statistics*, *85*(4), 1063-1070

14. **Markowitz (1952).** Portfolio selection. *The Journal of Finance*, *7*(1), 77-91.

15. **McCauley (2019).** Safe assets: made, not just born. BIS Working Paper No. 769.

16. **Mohanty and Turner (2006).** Foreign exchange reserve accumulation in emerging markets: what are the domestic implications?. *BIS Quarterly Review, September 2006.*

17. **Mussa (1981).** "The role of official intervention". Group of Thirty Occasional Papers No. 6, New York: Group of Thirty.

18. **Rajan (2014).** "Competitive monetary easing - is it yesterday once more?" Remarks at the Brookings Institution, Washington DC, 10 April 2014.

19. **Ramos-Francia and Garcia-Verdu (2018).** "Is trouble brewing for emerging market economies? An empirical analysis of emerging market economies' bond flows," Journal of Financial Stability, Elsevier, vol. 35(C), pages 172-191.

14. **Ramos-Francia and García-Verdú (2014).** Interventions and expected exchange rates in emerging market economies. The Quarterly Journal of Finance, 4(01), 1450002.

15. **Rey (2015).** "Dilemma not trilemma: the global financial cycle and monetary policy independence" NBER Working Paper No. 21162, National Bureau of Economic Research.

16. **Sargent and Wallace (1981).** Some unpleasant monetarist arithmetic. *Federal Reserve Bank of Minneapolis Quarterly Review*, *5*(3), 1-17.