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The recent growth of international reserves in developing economies: A monetary perspective

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A R T I C L E I N F O

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A B S T R A C T

The massive accumulation of international reserves in developing economies is a puzzling recent development in the world economy. This paper studies reserve accumulation as the outcome of a simple model in which the central bank smooths inflation. I explore the view that central banks accumulate reserves to face large fiscal shocks that need monetary financing. Central bank revenues are obtained through inflation, but inflation is distortionary. As a result, the central bank optimally accumulates international reserves in order to spread the costs associated with inflation over time. A simple numerical exercise for an average developing economy using data between 1970 and 2009 yields fast growth of international reserves.

1. Introduction

The last 20 years have witnessed a large increase in international reserve holdings by central banks in developing economies. Figure 1 plots the evolution of reserves for developed and developing economies as a share of their *GDP* between 1970 and 2009.[1] The most striking feature of this graph is the divergence between the two groups of countries between 1987 and 2009. Following a relatively stable period of reserves to *GDP* ratios close to 10%, since 1987 developed economies have been reducing their reserves relative to *GDP*. At the same time, developing economies have steadily increased their international reserves relative to *GDP* to a level that exceeded 20% in 2007.

Why have central banks in developing countries increased their reserve holdings, in contrast to their developed-country counterparts? This accumulation has important implications. From the

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[1] International reserves are defined as liquid external assets under the control of the central bank. This plot excludes holdings of gold.

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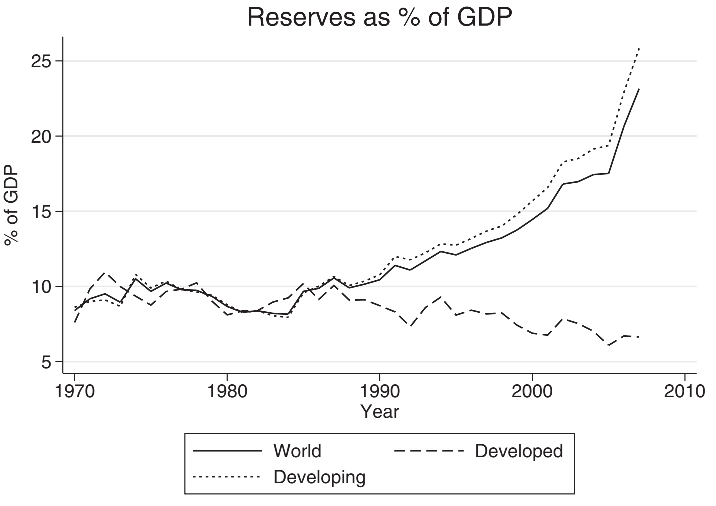

Fig. 1. Unweighted cross-country averages of International Reserves (minus gold) as a share of GDP for 24 developed economies and 154 developing economies between 1970 and 2009. Source: author's calculations based on the World Development Indicators. More details in Appendix C: Supplementary material.

perspective of a developing economy, it represents foregone consumption and investment in countries with good growth prospects. From the perspective of the global economy, reserves have played a role in the emergence of upstream capital flows – from poor to rich countries – and contributed to global imbalances. This paper takes a monetary view on this phenomenon and studies reserve accumulation by a central bank looking to smooth inflation.

I set up the problem of a central bank that has to finance exogenous and stochastic spending shocks with inflation. I interpret these shocks as banking sector support during a banking crisis. The central bank is a Ramsey planner, and maximizes the utility of the private agent. Inflation is distortionary and therefore the central bank wishes to spread distortions over time. To do so, it accumulates reserves in order to smooth inflation against these shocks.

Figure 2 shows the incidence of banking crises in the last 40 years. The blue bars plot the frequency of banking crises in the world economy during 5-year windows. These crises were particularly frequent in the last 20 years.[2] Banking crises were also very costly. The numbers on top of the gray bars represent the median fiscal cost of banking crises in percentage of *GDP* for each 5-year window. A substantial fraction of these fiscal shocks are financed with inflation related revenues. Available estimates of inflation related revenues amount to 10% of *GDP*, in episodes where the total fiscal cost ranges between 15 and 65% of *GDP* (Burnside et al., 2001, 2006). It is also possible to find examples of central bank support to the banking sector that require the central bank to hold liquid foreign assets. For example, in its 2008 annual report, the Russian central bank states that "funds provided by the Bank of Russia to maintain banking sector stability in September–December exceeded 9% of GDP", and justifies the decrease of international reserves with operations in the domestic foreign exchange market, as well as with direct support to the banking system.[3]

[2] Reinhart and Rogoff (2014) show that banking crises are not exclusive to the last two decades. Between the late 1890 and the early 1930s there was a similar incidence of banking crises across the world economy. They associate these events to increases in capital mobility (see fig. 3 in their paper).

[3] Looking at a larger sample between 1970 and 2011, Laeven and Valencia (2013) show that the median cumulative fiscal costs as a share of current GDP were 4.5% for advanced economies and 10.0% for developing economies. They do not differentiate between fiscal and monetary financed costs. They do show that developed economies rely more on increases in public debt following a banking crisis, as the median increase in debt as a share of GDP was 23.6% for advanced economies, and 10.2% for developing economies. The authors also discuss monetary interventions such as monetary expansion and liquidity support. Section 4 discusses the available data and gives more examples of central bank support to the banking sector.