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Foreign reserve management during the global financial crisis

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A B S T R A C T

This paper examines how countries managed their foreign currency reserves during the global financial crisis. Evidence based on changes in reserve stocks suggests that many governments, even those with high levels of pre-crisis reserves, were reluctant to use them during the crisis. As a consequence, a number of recent studies of cross-country experiences during the crisis find little evidence of a positive role for reserves in macroeconomic crisis-management. This paper examines whether this assessment of the *non*-role of reserves during the crisis is justified. While the reserve stock data indicates stable reserve levels for many countries during the crisis, distinguishing between reserve changes that occurred due to interest income and valuation changes on existing assets and asset purchases and sales, indicates that many emerging economies actively depleted reserves. Further, the data indicate that countries whose pre-crisis reserve levels were in excess of what can be explained by standard models of reserve accumulation were the most likely to sell reserve assets during the crisis.
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1. Introduction

The global financial crisis (GFC) led governments in hard hit countries to consider and often implement monetary and fiscal policy measures that would have been unthinkable prior to the crisis. Monetary authorities in many countries went from a singular focus on inflation targeting to embracing massive quantitative easing programs. Fiscal stimulus measures were passed in a wide array of countries, many of which had previously severely limited the role of government policies in the macro economy. In this context it is puzzling that the government policy tool that was particularly designed

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for crisis management, foreign reserves, seems not to have been widely used, even by those countries which had built up high levels of pre-crisis reserve stocks.

This paper examines the cross-country evidence on foreign currency reserve management during the global financial crisis. Evidence based on changes in reserve stocks suggests that many governments were reluctant to use them during the crisis. As a consequence, a number of recent studies of cross-country experiences during the crisis find little evidence of a positive role for reserves in macroeconomic crisis-management. This paper examines whether this assessment of the *non*-role of reserves during the crisis is justified.

The paper begins with an exploration of the measurement of reserve changes, which include both changes due to interest income and valuation changes on existing assets, as well as purchases and sales of reserves. The focus of the analysis in the paper is on changes in reserves that reflect policy decisions rather than market movements in asset prices. The data indicate that while reserve stocks remained stable for many countries during the crisis, interest income and valuation changes on these stocks of assets offset the effects of reserve sales, especially in emerging economies.

In order to better understand why certain countries chose to deplete reserves, while others relied on alternative policy tools to manage the crisis, the empirical analysis in the paper first seeks to establish the extent to which reserve accumulation prior to the crisis exceeded levels consistent with a benchmark empirical model that allows for both precautionary and exchange rate stability motives. I then test whether reserve accumulation behavior during and after the GFC differed for countries in which pre-crisis excess reserves were highest. The data indicate that depletion of reserves during the crisis was indeed higher in countries where pre-crisis excess reserve levels were more evident. I also find evidence that changes in reserves due to interest income and valuation changes, influences government decisions to purchase or sell reserve assets. Countries that experienced losses on their reserve stocks during the GFC tended to accumulate reserves after the crisis.

2. International reserve data

Reserve assets are denominated in foreign currency and are generally available to and controlled by monetary authorities for purposes of meeting balance of payments financing needs, for exchange rate intervention operations, and for other related activities that serve to maintain confidence in a country's currency and economy. Reserves are counted as part of national wealth, and are essential for countries with fixed exchange rates that want to avoid costly current account adjustments. When monetary authorities acquire international reserves they typically sterilize the effect of these purchases on the domestic monetary base by incurring domestic-currency liabilities, so that reserves in most countries are not net national assets. Because reserve assets are denominated in foreign currency and are most often held in the form of foreign government bonds, holding reserves exposes governments to foreign country, interest rate, and currency risk.[1]

Heller (1966) provides one of the first attempts at calculating an optimal country specific level of international reserves based on what he termed the precautionary motive. The three considerations he thought important to this calculation include: (1) the cost of adjusting to an external imbalance (measured as the propensity to import); (2) the cost of holding liquid international reserves (measured as the difference between the return on the reserves relative to a benchmark return on domestic bonds); and (3) the probability that there will actually be a need for reserves of a given magnitude (based on the history of past external imbalances). In practice there seem to have evolved a number of "rules of thumb" to determine optimal reserve levels loosely based on Heller's precautionary motive. These rules include maintaining reserves equivalent to: (1) three months of imports (to offset current account shocks); (2) 5–20% of M2 (to be able to shore up confidence in the value of the domestic currency in the event of a currency crisis); and (3) the value of all debt obligations falling due within the following 12 months (in the event of a sudden disappearance of short-term capital inflows).[2]

[1] Dominguez et al. (2010) examine the implications of systematic reserve decumulation (intended to mitigate valuation losses) on domestic currency movements.

[2] This is often referred to as the "Greenspan-Guidotti rule".

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