

## International reserves\*

by

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### Abstract

Developing countries, particularly in East Asia, account for most of the large increase in international reserves-GDP ratios in recent decades. Possible explanations include self-insurance against the output costs of sudden stops; precautionary fiscal demand by countries with inelastic fiscal outlays, sovereign risk, volatile and limited tax capacity; and a modern incarnation of mercantilism. Empirical studies reveal that the 1997–8 East Asian financial crisis triggered a sharp increase in hoarding international reserves. They suggest prominent roles for the precautionary demand and self-insurance motives and conclude that the financial integration of developing countries is associated with greater hoarding of international reserves.

International reserves are the liquid external assets under the control of the central bank. An intriguing development since the 1960s has been that, despite the proliferation of greater exchange rate flexibility, international reserves-GDP ratios increased substantially. Flood and Marion (2002) report that reserve holdings have trended upwards; at the end of 1999, reserves were about 6 per cent of global GDP, 3.5 times what they were at the end of 1960 and 50 per cent higher than in 1990. Practically all the increase in reserves-GDP holding has been by developing countries, mostly concentrated in East Asia.

These developments stirred lively debate among economists and financial observers. The earlier literature focused on using international reserves as a buffer stock, part of the management of

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an adjustable-peg or managed-floating exchange-rate regime. Accordingly, optimal reserves balance the macroeconomic adjustment costs incurred in the absence of reserves with the opportunity cost of holding reserves (see Frenkel and Jovanovic, 1981). The buffer stock model predicts that average reserves depend negatively on adjustment costs, the opportunity cost of reserves, and exchange rate flexibility; and positively on GDP and on reserve volatility, driven frequently by the underlying volatility of international trade. Overall, the literature of the 1980s supported these predictions; see Frenkel (1983), Edwards (1983), and Flood and Marion (2002) for a recent review.

While useful, the buffer stock model has limited capacity to account for the recent development in hoarding international reserves – the greater flexibility of the exchange rates exhibited in recent decades should work in the direction of reducing reserve hoarding, in contrast to the trends reported above. As an indication of excess hoarding, observers noted that developing countries frequently borrow at much higher interest rates than the one paid on reserves.

The recent literature provided several interpretations for these puzzles, focusing on the observation that the deeper financial integration of developing countries has increased exposure to volatile short-term inflows of capital (dubbed ‘hot money’), subject to frequent sudden stops and reversals (see Calvo, 1998; Edwards, 2004). Looking at the 1980s and 1990s, Aizenman and Marion (2004) pointed out that the magnitude and speed of the reversal of capital flows throughout the 1997–8 crisis surprised most observers. Most viewed East Asian countries as being less vulnerable to the perils associated with hot money than Latin American countries. After all, East Asian countries were more open to international trade, had sounder fiscal policies, and much stronger growth performance. In retrospect, the 1997–8 crisis exposed hidden vulnerabilities of East Asian countries, forcing the market to update the probability of sudden stops affecting all countries.

The above observations suggest that hoarding international reserves can be viewed as a precautionary adjustment, reflecting the desire for self-insurance against exposure to future sudden stops. Self-insurance has several interpretations. The first focuses on precautionary hoarding of international reserves needed to stabilize fiscal expenditure in developing countries (see Aizenman and Marion, 2004). Specifically, a country characterized by volatile output, inelastic demand for fiscal outlays, high tax collection costs and sovereign risk may want to accumulate both international reserves and external debt. External debt allows the country to smooth consumption when output is volatile. International reserves that are beyond the reach of creditors would allow such a country to smooth consumption in the event that adverse shocks trigger a default on foreign debt. Political

instability, by taxing the effective return on reserves, can reduce desired current reserve holdings. The tests reported by Aizenman and Marion (2004) are consistent with this interpretation. Another version of self-insurance and precautionary demand for international reserves follows the earlier work of Ben-Bassat and Gottlieb (1992), viewing international reserves as output stabilizers (see Aizenman and Lee, 2005; see Lee, 2004, for insurance perspectives of international reserves applying the option pricing theory). Accordingly, international reserves can reduce the probability of an output drop induced by a sudden stop and/or the depth of the output collapse when the sudden stop materializes (see Kaminsky and Reinhart, 1999).

The views linking the large increase in hoarding reserves to deeper financial integration face a well-known contender in a modern incarnation of mercantilism: international reserves accumulations triggered by concerns about export competitiveness. This explanation has been advanced by Dooley, Folkerts-Landau and Garber (2003), especially in the context of China. They interpret reserves accumulation as a by-product of promoting exports, which is needed to create better jobs, thereby absorbing abundant labour in traditional sectors, mostly in agriculture. While intellectually intriguing, this interpretation remains debatable. Some have pointed out that high export growth is not the new kid on the block – it is the story of East Asia since the 1950s. Yet the large increase in hoarding reserves happened mostly after 1997. This issue is of more than academic importance: the precautionary approach links reserves accumulation directly to exposure to sudden stops, capital flight and volatility, whereas the mercantilist approach views reserves accumulation as a residual of an industrial policy, a policy that may impose negative externalities on other trading partners.

Aizenman and Lee (2005) test the importance of precautionary and mercantilist motives in accounting for the hoarding of international reserves by developing countries. While variables associated with the mercantilist motive (like lagged export growth and deviation from Purchasing Power Parity) are statistically significant, their economic importance in accounting for reserve hoarding is close to zero and is dwarfed by other variables. Overall, the empirical results are in line with the precautionary demand. The effects of financial crises have been localized, increasing reserve hoarding in the aftermath of crises mostly in countries located in the affected region, but not in other regions. A more liberal capital account regime is found to increase the amount of international reserves, in line with the precautionary view. These results, however, do not imply that the hoarding of reserves by countries is optimal or efficient. Making inferences regarding efficiency would require having a detailed model and much more information, including an assessment of the

probability and output costs of sudden stops, and the opportunity cost of reserves. To conclude, greater exposure of developing countries to sudden stops and reversals of hot money as well as growing trade openness go a long way towards accounting for the observed increase in international reserves-GDP ratios by developing markets.

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*See also* exchange rate regimes (theory); exchange rate volatility; liquidity crises

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