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Foreign Exchange Reserves in East Asia: Why the High Demand?

Since the 1997–1998 Asian financial crises, monetary authorities in emerging markets in East Asia have more than doubled their stockpiles of foreign exchange reserves; by the end of May 2002, they held $845 billion, or 38% of the world total. Of these countries, China, Taiwan, Hong Kong, South Korea, and Singapore rank just behind Japan as the world's biggest holders of foreign exchange reserves —together those five countries hold reserves totaling nearly US$700 billion.

There is a growing debate about the need to hold so many reserves. Some critics point out that holding a lot of reserves is costly. Reserves held in U.S. Treasuries, for example, earn a modest return, far below these countries' own cost of borrowing either in local currency or in dollars. Why hold cash in the bank and pay high interest on outstanding liabilities? Critics also note that the yield on reserves is much lower than the potential return they could earn by using those reserves to make real investments in the economy, such as building roads, bridges, and schools.

Those who support holding large reserve balances argue that the cost of doing so is small compared to the economic consequences of a sharp depreciation in the value of the currency that is often associated with financial crises in emerging markets. A devaluation of the currency raises a country's costs of paying back debt denominated in foreign currency as well as its costs of imported goods, and it also raises the spectre of inflation. With a large stockpile of foreign exchange reserves, a country's monetary authority can buy up its currency in the foreign capital markets, which helps to uphold its value. By having its own ammunition to defend its currency in a crisis, a country with large holdings of reserves also avoids being shut out of international capital markets due to concerns that the government or the private sector will default on foreign debt payments. Therefore, these proponents argue, holding large reserve stockpiles is prudent policy for those occasions when defending the value of the currency makes sense.

In this *Economic Letter*, we report some of the factors that influence the decision to hold foreign exchange reserves in developing countries based on our recent research (Aizenman and Marion 2002a and 2002b). We also explore why these holdings surged in East Asia after the 1997 crises.

Trends in reserve holdings by emerging markets

Several factors may explain how much foreign exchange reserves a country wants to hold. One factor is related to the size of international financial transactions that occur there; that is, reserves holdings are likely to increase both with the size of the country's population and with its standard of living. Another factor is related to the volatility of international receipts and payments, insofar as reserves are intended to help cushion the economy; that is, reserve holdings are likely to increase with more volatility in a country's export receipts. A third factor is vulnerability to external shocks; reserve holdings are likely to increase with a country's average propensity to import, which is a measure of the economy's openness and vulnerability to external shocks. Finally, a country's tolerance for greater exchange rate flexibility should reduce its demand for reserves, because its central bank would not need a large reserve stockpile to manage a fixed exchange rate; therefore, reserve holdings are likely to be lower the more variable the country's exchange rate is.

We conducted statistical analyses using a panel of data consisting of 122 developing countries between 1980 and 1996—that is, before the Asian financial crises—and found strong correlations between these factors and reserve holdings. The scale factors—population size and real GDP per capita—were

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positive and highly significant. The volatility of real export receipts and the vulnerability to external shocks measured by openness also were positive and highly significant. Greater exchange rate variability was associated with significantly reduced reserve holdings. These five variables account for between 70% and 90% of the variation in actual reserve holdings depending on the estimation specification.

Our study (Aizenman and Marion 2002a) extended this analysis by adding two political measures that may lower the demand for reserves, namely, political instability and political corruption, in the sense that they act as a tax on the return to reserves. Because data on these measures are available for only a limited number of countries, the sample we examined was smaller. As a proxy for political instability, we used a measure of the probability that the government's leadership would change by constitutional means. For data on political corruption, we used a corruption index from Tanzi and Davoodi (1997). We confirmed that an increase in an index of political corruption significantly reduces reserve holdings, as does an increase in the probability of a government leadership change by constitutional means.

Next we examined whether the model with these specifications was successful at predicting reserve holdings during and after the Asian financial crises, that is, from 1997 to 1999. The results suggest that countries indeed have changed their behavior in terms of holding foreign exchange reserves. For example, in the case of Korea, the model *over*-predicts its reserve holdings for 1997, the year of the crisis, but it substantially *under*-predicts reserve holdings for both 1998 and 1999. These results suggest that, during and immediately after the crisis, Korea had limited access to global markets and could not immediately adjust its stock to the higher level it chose to maintain in 1998 and 1999. For the other emerging Asian economies, the underprediction of reserves over this period is less substantial but still significant (see Aizenman and Marion 2002a for full details). It is interesting to note that the model over-predicts Malaysian reserve holdings in all three years, suggesting the country may have faced a trade-off between being willing to adopt capital controls and being willing to hold international reserves. Because Malaysia chose to impose capital controls during the financial crisis, it reduced its effective integration with the global capital markets and its demand for international reserves.

Why have East Asian markets increased their reserves?

As the foregoing showed, the standard set of factors that affects the demand for foreign exchange reserves does not account for the very large buildup that has occurred in many emerging markets in East Asia. Therefore, we examine the possibility that the buildup may represent "precautionary" holdings, and we find two situations that can give rise to increased demand for such holdings (Aizenman and Marion 2002a).

The first is the government's desire to "smooth consumption"—that is, to spread out over time the costs of shocks, such as sudden outflows of international capital—when it faces difficulty raising funds either through international capital markets (because investors perceive a high risk that the government or the private sector will default) or through domestic tax collection. The model also helps us understand why some developing countries have not chosen to hold large precautionary reserve balances in the aftermath of the last decade's crises even when there are concerns about default risk or when domestic tax collection is costly. Specifically, we find that countries whose policymakers care less about the future, countries that are politically unstable, and countries suffering from political corruption find it desirable to hold smaller precautionary balances.

The second situation leading to a buildup of reserves is "loss aversion" after the 1997–1998 Asian financial crisis. Loss aversion is the tendency of people in the economy to be more sensitive to reductions in their consumption than to increases. In our model, we modify a generalized expected utility framework so that it attaches bigger weights to "bad" outcomes and smaller weights to "good" outcomes. We show that the government will choose to hold a small stock of reserves if it believes the populace is indifferent between reductions and increases in their consumption, while it will choose to hold a much larger stock of reserves if it believes the populace is loss-averse. We also show that, even when the return on domestic capital far exceeds the return on the safe asset, it can still be desirable for the government to hold large reserve balances if agents are loss-averse.

Conclusion

Our research found that a standard set of explanatory factors does a good job in explaining central

bank reserve holdings of developing countries through 1996, but it under-predicts reserve holdings of countries in East Asia after that. Undoubtedly, the recent large buildup of international reserve holdings in East Asia is motivated by the experience of the recent Asian financial crisis. When countries' access to capital markets is diminished because their governments and private sectors appear to be at high risk of defaulting and when it is costly either to raise taxes or to cut government spending, countries will find it desirable to hold large precautionary reserve balances. When countries attach more weight to bad outcomes than to good ones, they also find it desirable to hold sizeable precautionary balances of international reserves, even if the return on investing domestic capital far exceeds the return on reserves. Not all developing economies, indeed not all emerging markets, will hold large reserve stockpiles in the aftermath of crises, however. Countries that strongly favor current consumption, that experience political instability, or that suffer from political corruption face a lower effective return on holding reserves and will acquire more modest stockpiles.

While our study is consistent with the view that hoarding foreign exchange reserves may serve a useful role, it does not follow that all countries will benefit from adopting this strategy. In particular, our results suggest that the benefits accrue only when countries optimally control both the saving of precautionary reserves and external borrowing. Attempts to focus only on the reserves side may disappoint if the borrowing side is abused as a result of political uncertainty or corruption.

Joshua Aizenman
Professor of Economics
UC Santa Cruz, NBER, and
Visiting Scholar, FRBSF

Nancy Marion
Professor of Economics
Dartmouth College

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