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To Float or Not to Float? Exchange Rate Regimes and Shocks

Many economists argue that a flexible exchange rate regime is preferable to a fixed exchange rate regime because it helps to insulate the domestic economy from adverse external shocks. For example, when export demand declines, a depreciation makes domestic goods more competitive abroad, stimulates an offsetting expansion in demand, and dampens the contraction in domestic economic activity.

In reality, however, exchange rate depreciations in many emerging market economies over the past decade typically have been associated with financial distress and output contractions. Consequently, recent research has reconsidered the stabilization properties of a flexible exchange rate regime when exchange rate movements affect financial conditions, and these, in turn, influence economic activity.

This *Economic Letter* summarizes some of the findings of these studies and their policy prescriptions for the choice of the exchange rate regime. Some studies find that, in spite of the adverse impact of changing exchange rates on financial conditions and aggregate economic activity, a flexible exchange rate regime is still preferable. Yet, this is difficult to reconcile with the observation that many emerging market economies prefer to avoid exchange rate adjustments. Other studies explain this behavior by showing how changing exchange rates can produce severe financial distress that, in turn, leads to a net loss of wealth. This mechanism explains why emerging market economies may prefer to keep the exchange rate fixed, at least in the short run, to mitigate the costs arising from exchange rate adjustment.

Balance sheet effects

Episodes of large exchange rate adjustments in emerging market economies during the 1990s were characterized by widespread defaults by do-

mestic firms and output contractions. This led many researchers to evaluate how financial conditions affect the impact of exchange rate adjustments on aggregate economic activity.

Financial conditions can influence aggregate demand through balance sheet effects on borrowing and investment expenditure. These effects occur when the interest rate at which firms borrow from financial intermediaries to finance investment depends on the level of net worth, which is essentially a firm's gross value of assets net of liabilities. Firms with a lower net worth tend to finance a greater share of their investment through debt. Since these firms will be more leveraged, they are less likely to meet their loan obligations in the event of some negative shock to their activity. Consequently, to compensate for the greater expected likelihood of default, lenders will charge these firms a higher risk premium. Therefore, a lower net worth, through an increase in the risk premium, leads to a higher cost of borrowing that, in turn, reduces investment.

When external liabilities are denominated in foreign currencies, as is the case for almost all emerging market economies, exchange rate depreciation may have negative balance sheet effects. Since domestic firms typically earn their revenues in their domestic currency, depreciation makes these revenues worth less in terms of foreign currency, thereby reducing their capacity to service foreign currency debt. The associated reduction in net worth generates an increase in the risk premium on borrowing that dampens investment expenditure and aggregate demand. Therefore, the interaction of balance sheet effects and foreign currency denomination of liabilities can lead exchange rate depreciations to be contractionary and render flexible exchange rate regimes less attractive.



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The question is: Are these balance sheet effects large enough to make policymakers prefer a fixed exchange rate regime? Céspedes, Chang, and Velasco (2004) and Gertler, Gilchrist, and Natalucci (2003) address this question by analyzing the reaction of an emerging market model economy to an adverse external shock, such as an increase in the foreign interest rate. These studies conclude that, even in the presence of balance sheet effects, flexible exchange rates still provide more output stabilization in response to a negative external shock.

For example, consider the effect of an increase in the foreign interest rate above the domestic interest rate. Under flexible exchange rates, this induces a financial outflow and a depreciation of the domestic currency. With liabilities denominated in foreign currency, this channel produces a decrease in net worth. However, there are also positive consequences from the asset side of firms' balance sheets. Because the depreciation makes domestic goods relatively cheaper, export revenue rises, creating a positive impact on net worth. If this positive effect dominates and net worth rises, the overall effect of depreciation need not be contractionary.

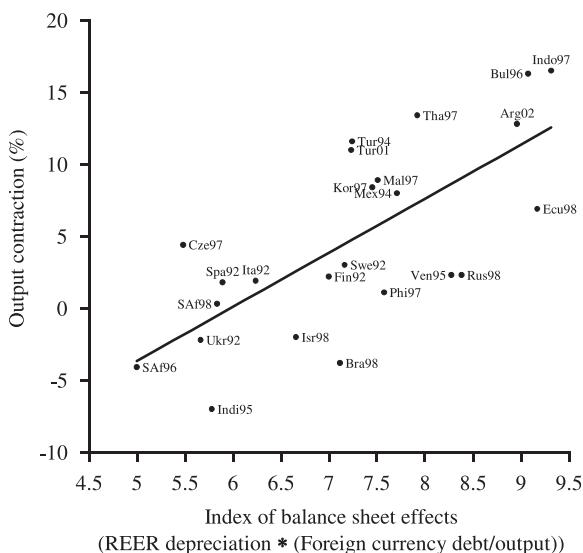
Alternatively, under fixed exchange rates, the central bank must raise the domestic interest rate to match the increase in the foreign interest rate so as to prevent the domestic currency from depreciating. This interest rate rise leads to a decrease in a firm's net worth because future revenues are worth less in current value terms. As net worth shrinks, the risk premium rises, inducing a contraction in investment spending and output. Therefore, under fixed exchange rates, balance sheet effects exacerbate the contractionary effects of an increase in the foreign interest rate on investment, aggregate demand, and output.

Some stylized facts

Despite these theoretical arguments in favor of a floating exchange rate policy, many emerging market economies appear averse to exchange rate adjustments. Calvo and Reinhart (2002), notably, report evidence of widespread fear of large exchange rate adjustment in emerging market economies. In addition, Hausmann, Panizza, and Stein (2001) find that this is particularly so for countries that borrow heavily abroad in foreign currency, as they are exposed to the potential for balance sheet deterioration.

Cavallo et al. (2004) find that balance sheet effects are, in fact, at the root of the output contraction

Figure 1
Output contractions and balance sheet effects



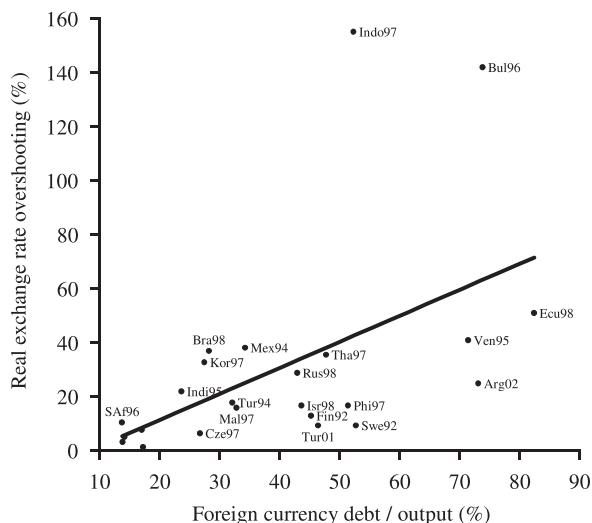
in the aftermath of an exchange rate adjustment. As shown in Figure 1, they detect a positive relation between the severity of output contractions and an index of intensity of balance sheet effects, where the latter is measured by the product of total real exchange rate (REER) depreciation and the ratio of net foreign currency liabilities to output. In addition, they observe that many of the recent exchange rate adjustment episodes in emerging market economies have been characterized by exchange rate overshooting; that is, the degree of exchange rate depreciation in the short run was considerably larger than in the long run. Cavallo et al. (2004) also find that exchange rate overshooting is greater the higher is the ratio of foreign currency debt to GDP, as Figure 2 indicates.

Which exchange rate policy?

Cavallo et al. (2004) formulate a model that relates these stylized facts by recognizing one additional feature of most recent episodes of exchange rate adjustment in emerging market economies; specifically, these countries also experienced a decline in the confidence of foreign investors that sharply curbed their ability to borrow from abroad.

In their model, exchange rate depreciation produces negative balance sheet effects that interact with the reduced ability to borrow abroad, which, in turn, generates the need to reduce external indebtedness even further. This can be achieved through two channels: reducing imports of foreign goods and selling equity claims in domestic firms to foreign investors. Each channel of adjust-

Figure 2
Real exchange rate overshooting
and foreign currency debt



ment has further effects. The drop in imports induces a further depreciation of the exchange rate that results in exchange rate overshooting, while the sale of domestic assets prompts a decline in domestic equity prices (see Aguiar and Gopinath 2005 for evidence on East Asian countries during the late 1990s). Both effects are stronger when the exposure to foreign currency liabilities is larger, as any depreciation creates a greater need to reduce external indebtedness. In addition, they magnify the costs of exchange rate depreciation: exchange rate overshooting interacts with sizable foreign currency liabilities and exacerbates the adverse balance sheet effect of depreciation on output, while the sale of domestic assets at a discount implies a net loss of wealth that permanently affects domestic consumption.

Preventing exchange rate depreciation avoids the negative balance sheet effects and lessens the need to sell off domestic equity assets, but at the cost of making domestic goods less competitive. This hampers aggregate demand and depresses domestic output. For this reason, as other studies have concluded, a regime of flexible exchange rates may in fact dominate in the long run. In the short run, however, matters can be quite different: in the face of a sharp reduction in the ability to borrow externally, keeping the exchange rate fixed mitigates the disruption caused by the necessary sales of domestic equity assets and the resulting loss of wealth, so that, in this case fixed exchange rates dominate.

Conclusions

In answer to the question posed in the title, “to float or not to float,” the evidence and the models discussed in this *Economic Letter* point to the relevance of foreign currency liabilities in choosing the appropriate exchange rate policies in response to adverse external shocks. Specifically, recent research has found that, even when financial conditions influence aggregate economic activity, flexible exchange rates can be more desirable than fixed exchange rates as a tool to deal with adverse external shocks. However, in emerging market economies these shocks often involve temporarily reduced access to international financial markets. Under such scenarios, a policy of flexible exchange rates can lead to substantial costs. Conversely, a policy of fixed exchange rates dampens these costs, and, at least in the short run, can be preferred to an exchange rate adjustment.

Michele Cavallo
Economist

References

[URL accessed January 2005.]

- Aguiar, Mark, and Gita Gopinath. 2005. “Fire-sale FDI and Liquidity Crises.” *Review of Economics and Statistics*, forthcoming.
- Calvo, Guillermo A., and Carmen M. Reinhart. 2002. “Fear of Floating.” *Quarterly Journal of Economics* 117 (May) pp. 379–408.
- Cavallo, Michele, Kate Kisselev, Fabrizio Perri, and Nouriel Roubini. 2004. “Exchange Rate Overshooting and the Costs of Floating.” Mimeo. New York University.
- Céspedes, Luis Felipe, Roberto Chang, and Andrés Velasco. 2004. “Balance Sheets and Exchange Rate Policy.” *American Economic Review* 94 (September) pp. 1183–1193.
- Gertler, Mark, Simon Gilchrist, and Fabio M. Natalucci. 2003. “External Constraints on Monetary Policy and the Financial Accelerator.” NBER Working Paper no. 10128. <http://papers.nber.org/papers/w10128.pdf>
- Hausmann, Ricardo, Ugo Panizza, and Ernesto Stein. 2001. “Why Do Countries Float the Way They Float?” *Journal of Development Economics* 66 (December) pp. 387–414.

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