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Monetary Independence in Emerging Markets: The Role of the Exchange-Rate Regime

How much do emerging market economies benefit from having an autonomous monetary policy? This is a question that must be considered when evaluating the pros and cons of *dollarization*, that is, of adopting a foreign currency as the legal tender of the country. A country that *dollarizes* effectively transfers all monetary policy decisions to the U.S. Federal Reserve Board. Similarly, a firm, permanent peg, such as a currency board arrangement, also implies essentially giving up the possibility of having a monetary policy (and, obviously, an exchange-rate policy). This question is of consequence because there are situations, such as responding to a negative terms-of-trade shock or trying to stim-

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ulate the domestic economy out of a recession, where the ability to affect interest rates and exchange rates may, in principle, be a valuable instrument.

In this paper we attempt to evaluate the degree of monetary independence across different exchange regimes. Defining monetary independence in a precise way is not straightforward when one considers the decisions made by a central bank in some detail. Broadly, we define monetary independence as the leeway that a central bank has to set domestic interest rates without concern for the effect on the value of the domestic currency in foreign exchange terms or the international reserves position. The United States enjoys a high level of monetary independence because the Fed manages monetary policy with a view to maintaining desirable levels of inflation and economic growth, largely neglecting the exchange rate of the U.S. dollar or the repercussions of monetary policy actions on the exchange rate of the U.S. dollar. Few, if any, other countries conduct monetary policy with a similar lack of concern about the foreign exchange market.

The question that we investigate in this paper is how economies with different exchange regimes react to changes in U.S. interest rates and in international financial market conditions. In principle, floating exchange rates provide a basis for an independent monetary policy. Under a pegged exchange-rate regime, domestic interest rates will follow closely changes in U.S. interest rates and in the international risk premium, that is, they are highly sensitive to U.S. monetary policy and international financial market developments. In contrast, economies with floating exchange rates can, in principle, accommodate international interest-rate shocks by allowing the exchange rate to adjust. The extent to which domestic interest rates actually react should depend on the monetary policy framework adopted. Under inflation targeting, for example, if an increase in U.S. interest rates causes the domestic currency to depreciate significantly, the central bank is likely to tighten monetary policy to

temper the increase in inflation resulting from the pass-through of the depreciation into domestic prices. Thus, the overall effect of the increase in U.S. interest rates will be some increase in domestic interest rates and some exchange-rate depreciation, whereas in a pegged regime the effect should be felt fully by domestic interest rates.

In the turbulent international financial environment of the past few years, however, this view has been called into question. It has been argued that in the presence of external liabilities denominated in international currencies, volatility in international financial markets forces monetary policy in floating regimes into a "defensive mode" to avoid currency crises. An expansionary monetary policy, or allowing the exchange rate to depreciate significantly, would risk starting a panic among financial investors and trigger sharp capital outflows or even a currency collapse. Thus, monetary and exchange-rate policy are effectively not available as policy options, and there is no advantage to having a floating exchange rate or a national currency. In fact, because of the fear of possible negative market reactions, floating exchange-rate countries may be even more constrained than fixed-rate ones in their response to external shocks.[1]

The Tests

To investigate this question we focus on the extremes of exchange-rate regimes: currency boards and floating exchange rates. We contrast Argentina with Mexico in Latin America and Hong Kong with Singapore in Asia, that is, the countries with the longest history in

1. Paradoxically, it has been suggested that dollarization could break this type of link to international financial markets by changing market perceptions to such an extent that the country no longer belongs in the emerging-market risk class. The case of Panama, however, illustrates the fact that dollarization per se is not sufficient to elevate a country above the emerging-market risk class.

recent times of currency board arrangements and floating exchange-rate systems, respectively. Focusing on the polar cases has the advantage of making it more likely that we will find a sharper contrast in the implications of the exchange-rate system. Furthermore, there is a growing view that intermediate regimes are not likely to be feasible in a world of high capital mobility; the comparison of the polar exchange-rate cases may then be the only relevant one in the future. We also included a few more advanced countries with floating exchange-rate regimes: Australia, Canada, and New Zealand.

Analyzing the question at hand presents some methodological difficulties. Domestic interest rates (and the exchange rate) are affected by many variables in addition to U.S. interest rates or the international risk premium. In the context of a simple relation between domestic interest rates and U.S. rates, this will at best add noise and at worst bias the results if U.S. and domestic interest rates are both affected by common shocks. For example, an increase in oil prices may prompt the Federal Reserve Board to increase interest rates to arrest inflationary pressures; the Banco de Mexico may do the same thing, although not in response to the U.S. monetary policy change. Other shocks may cause interest rates to move in opposite directions in the two countries. This would happen, for example, as a result of a "flight to quality" by international investors. In the wake of the Russian and Long-Term Capital Management (LTCM) crises in August 1998, for example, international investors fled from emerging-market debt into safer assets such as U.S. Treasury bonds; this response alone would tend to make interest rates move in opposite directions in the United States and Mexico. Moreover, the Federal Reserve Board eased monetary policy, whereas the Banco de Mexico had to respond to a fast depreciation of the exchange rate by tightening its monetary stance. Ideally, we would like to isolate from or control for those shocks that cause an extraneous influence and focus on the impact of U.S. monetary policy shocks on emerging markets.

We follow three different approaches to examine the impact of U.S. monetary policy shocks on countries with different exchange-rate regimes. The first is an event study of monetary policy actions. The second is an econometric approach involving two or three financial variables at the daily frequency. The third is an econometric approach at the monthly frequency that includes a standard small-scale macroeconomic system.

The first approach identifies monetary policy actions taken by the United States and investigates their impact on interest rates and, where relevant, exchange rates in other countries. The monetary policy actions are identified as the days in which the Federal Open Market Committee (FOMC) of the Federal Reserve Board decided to change the federal funds target rate. These are well-identified and highly watched events by financial markets worldwide; by concentrating on changes in interest rates on dates of Fed actions one can be reasonably sure that coincidence with spurious factors is minimized; in addition, we check that the Fed actions were not themselves a response to other news hitting markets on that precise day. The problem, however, is that all monetary policy actions are, to some extent, expected. If the Fed raises interest rates when it is fully expected by financial markets, nothing will happen to financial variables in the United States and other countries. Thus, rather than taking the change in the federal funds rate itself, we use the change in short-term (three-month) Treasury Bill rates (on the day of a Fed action) as the measure of the monetary policy "shock." This change will be associated with the extent to which the action was unexpected and is thus a better measure of the information to which interest rates and exchange rates in other countries will react. An alternative measure of the impact of the monetary policy action can be obtained by comparing the level of the federal funds rate after the action with the federal funds futures rate that prevailed just before the Fed action. Both measures of the impact of monetary policy actions are in fact quite similar and generate similar results.

The disadvantage of this approach is that it provides a relatively limited number of observations.

Our second approach is to use the full time-series data of daily observations of U.S. interest rates, domestic interest rates, and, where applicable, the exchange rate in an econometric system. Although subject to the potential biases mentioned above, this procedure permits us to examine the relationship of interest for the whole available sample. The method also allows for a more general structure of lags in the relationship. One advantage in this case is that it is safe to make the assumption that U.S. interest rates are exogenous to changes in Mexican interest rates, for example, which facilitates the identification of the system. Yet there is one factor that may pollute the relationship between U.S. and domestic interest rates that was particularly strong in recent years: volatility in international financial markets. This factor can be controlled for, in principle, by adding to the system a variable measuring the international risk premium, such as the average spread on emerging-markets external debt, as measured by J.P. Morgan's Emerging Markets Bond Index (EMBI). Moreover, the reaction of domestic financial variables to the international risk premium under different exchange-rate regimes is of policy interest by itself. Therefore, to evaluate the performance of floating versus fixed exchange-rate systems, it is important also to consider their response to international risk premium changes.

Our third approach is to estimate the system at monthly intervals, incorporating the variables that are standard in small-scale macroeconomic models: the money supply, output (measured by industrial production), and inflation, in addition to the international risk premium. The advantage of the larger system is that it accounts for other factors that influence domestic interest rates, which, if excluded, may bias the relationship we are trying to isolate. The disadvantage is that working at lower frequency makes it more difficult

to identify the policy effects we are investigating. It turns out that the main results are fairly robust to the three approaches adopted.

The Results

As regards the impact of U.S. monetary policy actions, the effect on Hong Kong rates is close to one for one, and even larger on Argentina's rates.[2] The impact is much lower on the floating exchange-rate countries; the estimated coefficient is less than 0.5, and it is not statistically different from 0 in various cases. The scatter diagrams in figure 1 display the relationship between the change in U.S. Treasury Bills rates (the impact of U.S. monetary policy actions) and changes in domestic interest rates in Hong Kong and Singapore on days in which the FOMC decided to change interest rates.

Perhaps surprisingly, we mostly did not detect a significant reaction of the *exchange rate* in the six countries with floats or managed floats to U.S. monetary policy actions. However, while statistically significant in only two cases, the size of the coefficients was fairly similar across countries. A 1-point increase in the U.S. Treasury Bill rate is associated with a depreciation of the domestic currency of around 1 percent in most cases.

The results from the daily frequency systems are qualitatively similar. The impact of changes in the U.S. interest rate (measured as either the ninety-day Treasury Bill rate or as unexpected changes in the federal funds rate)[3] is generally significant across the board, but the impact is higher for the currency board countries. For example, an increase of ten basis points in U.S. interest rates increases interest

2. The estimates are less precise in the Argentine case, where various measures of interest rates were used because the most appropriate rates (money market rates at sixty or ninety days maturity) are available only for a limited time period.

3. This is measured as the difference between the average federal funds rate and the one-month federal funds futures rate on the last day of the preceding month.

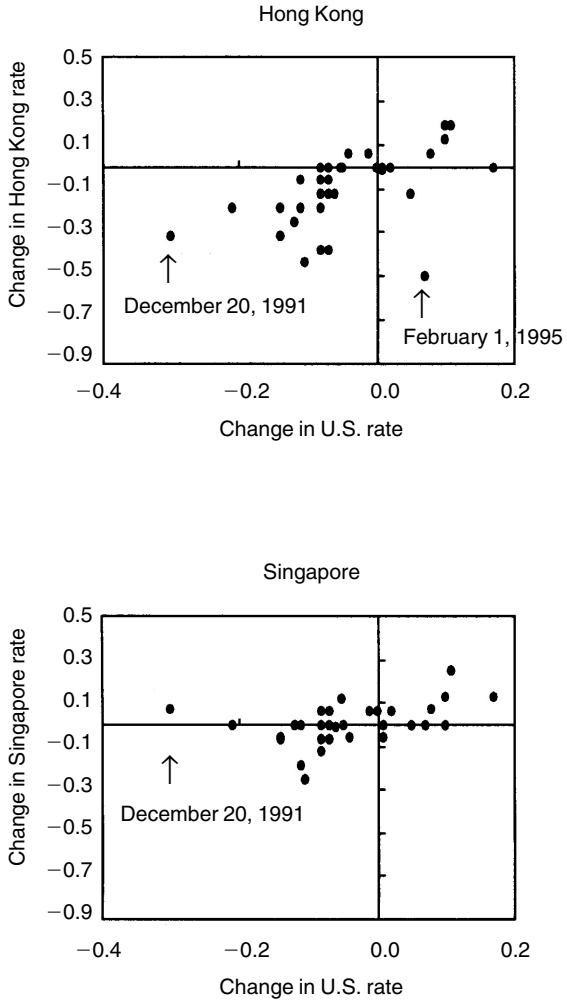
Hong Kong
Change in Hong Kong rate
0.5
0.3
0.1
−0.1
−0.3
−0.5
−0.7
−0.9
December 20, 1991
February 1, 1995
−0.4
−0.2
0.0
0.2
Change in U.S. rate
Singapore
Change in Singapore rate
0.5
0.3
0.1
−0.1
−0.3
−0.5
−0.7
−0.9
December 20, 1991
−0.4
−0.2
0.0
0.2
Change in U.S. rate

Figure 1.

rates, over a period of five days, by about ten to twelve basis points in Hong Kong and by about ten to thirty basis points in Argentina but only by about two to four basis points in Singapore; the effect in Mexico is in fact statistically insignificant due to imprecise estimation. The daily system does detect a significant effect on the exchange rate of Singapore, with a hundred-basis-point increase in U.S. interest rates causing a 0.5 percent depreciation of the Singaporean dollar. For the "control" floating-rate countries, we find an effect on interest rates in the order of 4–6 points in Australia and New Zealand and 6–8 points in Canada, and only small effects on exchange rates.

Increases in the international risk premium (measured as the average spread in emerging markets bonds) have a strong impact on domestic interest rates in Mexico and Argentina (of about the same magnitude) and in Hong Kong for the period after the Asian crisis. No such effect could be detected in Singapore, where the reaction is marginally negative, suggesting a safe-haven effect.

The systems at the monthly frequency generally indicate a stronger effect of U.S. interest rates on domestic interest rates. Again the impact is stronger in Hong Kong (between one to one and one-half to one) and Argentina (two to one or higher). There is a loss of statistical significance in the case of Singapore but higher significance in Mexico, Australia, New Zealand, and Canada. Emerging-market spreads are again significant in Latin America but not in Asia.

In summary, the following are the main findings:

- We found a significant impact of U.S. interest rates on domestic interest rates for both currency board countries and floating-rate countries. The effect, however, is significantly larger for the currency board countries Hong Kong and Argentina relative to Singapore, Australia, New Zealand, and Canada. The comparison with Mexico is hampered by imprecise estimation. This finding is fairly consistent across the three methods applied.

- Changes in EMBI spreads affect domestic financial variables significantly in both Argentina and Mexico, with roughly equal effects. However, Singapore seems to react much less to such shocks than Hong Kong.

These results are broadly consistent with the traditional view that floating exchange-rate regimes give some degree of monetary control to the central bank. The main puzzle that remains is why floating exchange rates do not seem to have been successful in shielding interest rates in Mexico from shocks to international risk premia. This is not easily attributable to "fear of floating" since exchange rates in Mexico also reacted very strongly to such shocks.