Box 1.3. International Spillovers and Macroeconomic Policymaking

The duration and severity of the Great Recession induced a variety of unconventional policy responses in a number of countries. This is especially true in the United States, where an alphabet soup of liquidity support programs has been complemented by two rounds of so-called quantitative easing. The latest round, dubbed "QE2" by some, has been met with opprobrium in some circles, in part because the Federal Reserve's aggressive attempts to return employment to normal levels are seen as damaging to the interests of smaller economies, particularly those that do not consider themselves to have substantial excess supply. Out of this experience have come renewed calls for international policy coordination. This box takes a selective look at this issue, focusing on monetary policy coordination but with a few words on fiscal policy at the end.

To presage the results, policy coordination can deliver outcomes that are superior to those of policies that are driven only by national interests. However, it turns out that the case for systematic coordination of monetary policy is not as strong as one might think, although the range of models in which this question has been analyzed is still quite limited. More research is clearly warranted. By contrast, the case for coordination is easier to make for fiscal policy.

Popular discussion suggests that the argument in favor of policy coordination—in particular for large economies or collections of small ones—is irrefutable. After all, in times of widespread deficiency in domestic demand, all economies have an incentive to "export their way out of recession," even if the arithmetic of trade accounts makes that an impossible feat. The economic literature, however, is not nearly so clear-cut. In the context of monetary policy, Obstfeld and Rogoff (1995) laid down a marker by showing in a simple two-country model that policies that are "self-oriented" are difficult to beat. Subsequent contributions to the literature have mitigated this result, but arguably not in a way that undermines the case for self-oriented monetary policy, at least as a reasonable approximation of the optimal policy.[1] If the theory is ambiguous, quantitative assessments are even more so, if only because there have been so few.

To illustrate, consider the policy choices available to the monetary authority of a small economy operating in a world that is dominated by a much larger economy. In order to encompass the rigidities and imperfections in exchange rate pass-through emphasized by the literature to date in making a case for coordination, we use a version of the IMF's Global Economic Model (GEM) used in Laxton and Pesenti (2003).[2] Both economies are assumed to implement monetary policy by means of a Taylor-type rule, the most general form of which is

$$R = \alpha_R R_{t-1} + (1 - \alpha_R)(rr^* + \tilde{\pi}_t) + \alpha_y y_t + \alpha_\pi(\tilde{\pi}_t - \pi^*) + \alpha_e(\Delta e_t - \Delta e^*),$$

where R is the nominal policy rate; $\tilde{\pi}$ is (four-quarter) inflation; Δe is the change in the (log of the) real exchange rate; and rr^* is the equilibrium real interest rate. For this exercise, rr^* and the target rate of inflation, π^*, are taken as constants and normalized to zero; some implications of this assumption are discussed below.

Assume that the large economy does not consider the effects of its policy decisions on the small economy—which is natural given the relative sizes of the two economies. One way to characterize the critique of recent U.S. monetary policy is to consider policy rules for the large economy that place a large coefficient on its output gap, sacrificing other objectives in order to rapidly return economic activity to equilibrium levels following shocks. With this

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[1]The case for the coordination of monetary policy usually hinges on rigidities that slow down the pass-through of foreign shocks into domestic aggregate price levels. Incomplete or delayed exchange rate pass-through hinders the adjustment of the real wage to its equilibrium level, inducing fluctuations in employment that would otherwise not occur. An incomplete sampling of references might include Betts and Devereux (2000), Pappa (2004), and Corsetti and Pesenti (2005).

[2]GEM is a linearized microfounded, two-country model with tradable and nontradable goods, monopolistic competition in labor and some goods markets, sticky prices, and incomplete pass-through stemming both from the presence of intermediate goods and from adjustment costs. See Laxton and Pesenti (2003) for details.

Box 1.3 *(continued)*

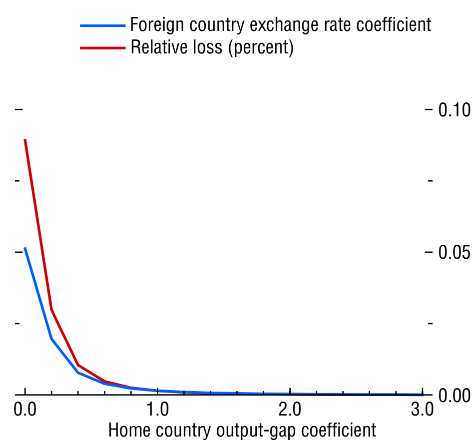
in mind, the exercise below encompasses this and other policy stances by allowing the coefficient on the large economy output gap, α_y, to vary from zero to 3.[3] The small economy takes the large economy's policy rule as given and then chooses the coefficient on the exchange rate term in the small-economy policy rule, holding other coefficients constant to minimize the following loss function:[4]

$$L = \Sigma_{i=0}^{\infty} y_{t+i}^2 + (\bar{\pi}_{t+i} - \pi^*)^2 + \tfrac{1}{2}(\Delta R_{t+i})^2.$$

If the large economy's policy choice is harmful to the small economy's performance, and if controlling the exchange rate is helpful for offsetting the large economy's policy choices, α_e for the small economy will differ substantially from zero, and the effect on the small economy's economic performance, as measured by its loss function, will be large.[5]

The results of this exercise are summarized in Figure 1.3.1. The coefficient on the large economy's output gap is indexed on the horizontal axis. Focusing first on the blue line, there are several observations of note. First, the downward slope of the line shows that as the large economy places increasing importance on combating output fluctuations, the small economy's exchange rate coefficient *falls;* only when the large economy pays almost no (direct) attention to output is there a reason for the small economy to respond to the exchange rate, at least through standard monetary policy channels. Second, the quantitative implications for monetary policy with respect to the exchange rate are not very large: at no time does the feedback coefficient rise above 0.1.[6] These results suggest that large and small economies' objectives are largely complementary: when the large economy acts to stabilize real activity within its own borders, it reduces what would otherwise be negative demand spillovers to the rest of the world. The fact that the coefficient on the exchange rate in the small economy's policy rule is never very large is a reminder that stabilizing inflation, as the economy does in all cases here, goes a considerable way toward stabilizing output, regardless of the feedback coefficient on the gap.

Figure 1.3.1. Optimized Exchange Rate Coefficient and Relative Loss as a Function of Home Output Gap Response[1]



Source: IMF staff calculations.
[1]All other policy rule coefficients held fixed.

[3]For a model of this class, $\alpha_y = 3$ is a very large coefficient. For the home economy, the baseline parameters for the policy rule are $\alpha_R = 1$, $\alpha_\pi = 0.7$, $\alpha_y = varying$, and $\alpha_e \equiv 0$. Results are similar for different parameterizations of the home economy rule and, in particular, for $\alpha_e \neq 0$. For the foreign country, $\alpha_R = 0.97$, $\alpha_\pi = 0.7$, $\alpha_y = 0.4$, and $\alpha_e = optimized$. The foreign country's coefficients are very close to the optimal coefficients, conditional on no feedback on the exchange rate.

[4]Formally, the optimization is done numerically by minimizing the loss function, subject to the (linear) model; the form of the policy rule; the home economy model, including its policy rule; and the variance-covariance matrix of stochastic shocks. This is the same loss function that is used in Laxton and Pesenti (2003).

[5]The experiment conducted here is a restricted version of one where all four parameters of both economies' policy rules are optimized economy by economy, defining what is known as a Nash strategy in Taylor rules, or jointly using a weighted average of the two economies' loss functions, defining a cooperative strategy in Taylor rules. This broader exercise proved to be numerically problematic for a model as large and complex as the GEM; however, the experiments that were feasible suggested that the same conclusions as described in the text would be forthcoming.

[6]Although this exercise was carried out for particular rules for both economies, the basic conclusions are the same for reasonable specifications. However, the results will differ if the parameterization of the policy rule for the foreign economy is well away from optimal, when the exchange rate term is omitted. Under such circumstances the optimized exchange rate term will crudely proxy for the inappropriate feedback terms on output or inflation.

Box 1.3 *(continued)*

Now consider the red line. The line shows the incremental cost, in percent (right scale), of omitting the exchange rate term altogether. Given how small the feedback coefficients are on the exchange rate term, it is probably not surprising that the loss from eschewing feedback on the exchange rate is very small, never larger than 0.1 percent. The upshot, in this context at least, is the conclusion of Obstfeld and Rogoff (2002): two economies practicing inward-looking policies will produce policy outcomes that are quite good, even if they are not quite optimal. It is important to note that it is not that spillovers from the large economy to the small economy are inconsequential. Rather, a properly designed monetary policy, focused narrowly on key macroeconomic objectives, insulates the small economy well. It does this by aligning private agents' expectations with policymakers' goals; the former becomes an instrument, of sorts, of the latter.[7]

There are, of course, some caveats. First, the results depend on the monetary authorities knowing not only their own economy's model but that of the other economy as well.[8] Second, the optimization exercise was carried out for a computed variance-covariance matrix of shocks, but if the shocks during a particular episode turn out to be atypical, the prescribed policy response might be inappropriate. This is true particularly if the shocks in question alter the dynamic structure of the economy.[9] Third, these results are conditional on the model and all its features, including linearity and rational expectations. These can be important. The linear analysis carried out here, for example, ignores the effective lower bound on nominal interest rates, a binding constraint on some authorities at the moment. And the extant literature has considered only a limited range of distortions that might provide a case for cooperation. Undoubtedly, there is a need for further research on these and other issues. Nevertheless, the results shown here—which are consistent with the economic literature—do suggest that the case for coordination of monetary policy is limited, at least under normal circumstances and with conventional models.

We have seen that the case for monetary policy coordination is not as obvious as might be expected. Does this finding generalize to fiscal policy? It was noted above that the analysis here was conducted taking the equilibrium real interest rate, rr^*, as a constant. This is a reasonable assumption for economies with a record of stable monetary policy. Under such circumstances, the conduct of monetary policy is a relatively simple exercise in stabilizing the economy around a given steady state. The situation for fiscal policy can be quite different. Although it is beyond the scope of this box to demonstrate, fiscal policy can affect the equilibrium real interest rate, the sustainable level of output, and the neutral level of the policy instrument, sometimes in ways that are difficult to measure. Fiscal policy, therefore, involves balancing gains or losses in the short term against permanent but deferred losses or gains in the long term as the economy approaches its new steady state. So if an economy's monetary policy is already broadly reasonable, the stakes when it comes to adjusting fiscal policy are generally higher. Moreover, fiscal policy in large economies, or collections of small ones, can affect the world real interest rate and hence the steady state of other economies. It seems reasonable to conclude, therefore, that the case for coordination of macroeconomic stabilization policies is stronger for fiscal policy than for monetary policy.

[7]Specifically not included in the class of policy regimes covered here is an exchange rate target, de facto or de jure. Under an exchange rate target, the foreign economy inherits whichever monetary policy the home economy adopts. Box 1.1 of the April 2010 *World Economic Outlook* explores exchange rate targeting regimes during the recent crisis.

[8]How serious this misspecification will be depends on the circumstances. It is worth noting that the apparent misspecification of the variance-covariance matrix of shocks is often a symptom of a more generalized misspecification of the underlying model. Frankel and Rockett (1988) provide a quantitative assessment of what can go wrong in policy coordination when decision makers' models are misspecified.

[9]For example, shocks that are larger and more persistent than normal could elicit macroeconomic outcomes that cause private agents to doubt the monetary or fiscal policy regime. Coordinated policies could be used to ensure the reestablishment of rational expectations equilibrium. For an example along these lines, see Eusepi and Preston (2008).