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Precautionary Policies

In a speech last month to the annual meeting of the American Economic Association, Fed Chairman Alan Greenspan said, "The Federal Reserve's experiences over the past two decades make it clear that uncertainty is not just a pervasive feature of the monetary policy landscape; it is the defining characteristic of that landscape." And he gave some examples of how the Fed made decisions about policy in the face of such uncertainty.

> Following the Russian debt default in the autumn of 1998, for example, the FOMC [Federal Open Market Committee] eased policy despite our perception that the economy was expanding at a satisfactory pace and that, even without a policy initiative, it was likely to continue doing so. We eased policy because we were concerned about the low-probability risk that the default might trigger events that would severely disrupt domestic and international financial markets, with outsized adverse feedback to the performance of the economy.

Another example involved a more detailed description of the problem of policymaking under uncertainty:

> For example, policy A might be judged as best advancing the policymakers' objectives, conditional on a particular model of the economy, but might also be seen as having relatively severe adverse consequences if the true structure of the economy turns out to be other than the one assumed. On the other hand, policy B might be somewhat less effective in advancing the policy objectives under the assumed baseline model but might be relatively benign in the event that the structure of the economy turns out to differ from the baseline. A year ago, these considerations inclined Federal Reserve policymakers toward an easier stance of policy aimed at limiting the risk of deflation even though baseline forecasts from most conventional models at that time did not project deflation; that is, we chose a policy that, in a world of perfect certainty, would have been judged to be too loose.

The research literature in economics has explored the task of decisionmaking under uncertainty and has developed theories about "precautionary" policies and "robust" policies. This *Economic Letter* summarizes some of the latest results and debates in this literature.

Symmetric and asymmetric costs of policy mistakes

Most discussions of monetary policy focus on the forecasts for inflation and real economic activity, and these forecasts, of course, are associated with some degree of uncertainty. In the basic framework economists generally use to address monetary policy issues, policymakers can ignore this uncertainty under certain conditions and instead determine the best policy based only on the mean, or average, forecast. For example, if the average forecast for inflation next year is 1%, the best policy action today is the same regardless of whether the range of forecasts is from 0 to 2% or whether the range is wider—and, therefore, more uncertain—say, from –2% to 4%.

One condition under which only the forecast matters while the uncertainty surrounding the forecast can be ignored is when the costs of undershooting or overshooting the policy target are symmetric. That is, if the central bank's target for inflation is 2% and the costs of having inflation turn out to be –2% are the same as the costs of having it turn out to be +6%, it makes sense simply to aim for the 2% target.

Uncertainty becomes an issue if the costs of errors are asymmetric. For example, suppose the inflation target is 2% and the costs of letting inflation fall below zero are greater than the costs of letting it rise above 4%; in that case, a policymaker might prefer to err on the side of higher inflation. That is, it might make sense to adopt a policy that reduces the chances of having inflation fall below zero, even if it does raise the chances that inflation will end up higher than 4%. A precautionary policy would err on the side of reducing the chance that the more costly outcome occurs.

These kinds of considerations are certainly not limited to monetary policymakers. Most of us are familiar with situations in which focusing only on expected outcomes does not lead to the best policy.

For example, suppose you have to catch an important flight, say, at 3:00 p.m. Do you aim to arrive right at 3:00 p.m. sharp? Probably not. Like most people, you will try to arrive at the airport a bit early, because the costs of running into an unexpected traffic jam and missing the flight are typically much greater then the costs of arriving early. The precautionary policy is to err on the side of getting to the airport a little early, even though this means that, on average, you waste some time reading magazines in the boarding area.

Acting with precaution means that the policymaker takes into account not just the expected forecasts for output and inflation but also the uncertainties surrounding those forecasts.

Robust policies

Another situation in which uncertainty, and not just expected outcomes, can matter occurs when policymakers want *robust* policies, that is, policies that do reasonably well regardless of what surprises may lie ahead. Finding policies that are robust is particularly important when uncertainty makes it difficult to assign probabilities to all the different possible future situations that could occur. The notion of robust policies is akin to the description of "policy A" vs. "policy B" described in Chairman Greenspan's speech. To put it in other words, a policy that is best if one's assumptions turn out to be correct may produce poor economic outcomes if the assumptions turn out to be wrong; in contrast, a robust policy may never be fully optimal for any particular future scenario, but when policymakers face great uncertainty, a robust policy will guard against having things turn out really badly.

A simple example of a robust policy is to carry an umbrella all the time, regardless of the weather forecast. Most of the time, you won't need it, but always having the umbrella with you protects you against the worst-case outcome—getting drenched in a downpour.

Hansen and Sargent (2004) have investigated a way of thinking about the uncertainty policymakers face by imagining the situation of a policymaker who knows that any model of the economy on which policy is based is likely to be mis-specified in unknown ways. Now make it even worse: imagine that the policymaker fears that any model she uses will turn out to be wrong in ways that produce particularly bad outcomes. It is as if the policymaker feared that events would conspire to make her look as bad as possible. A robust policy would be a policy that does well in this worst-case scenario.

Some critics have argued that basing policy choices on the worst-case outcome gives too much importance to what may be very unlikely events (Svensson 2000). Leaving for the airport so early that even in the worst traffic jam possible you still arrive in time for your flight probably means that you end up wasting too much time waiting at the airport and, as a consequence, fail to accomplish other important tasks you could have worked on at the office or at home. Or building a boat to survive in "the perfect storm" may make it too heavy and difficult to sail 99% of the time. In terms of the earlier description of "policy A" vs. "policy B," policy B may be benign in the event the worst-case outcome occurs, but it might be significantly less effective than policy A in all but this worst case. If the worst-case outcome is very unlikely, adopting policy B might lead to poor outcomes almost all the time.

Basing policy on a distorted model

One interpretation of robust policies is that these policies are optimal for a distorted model of the economy rather than for the model the policymaker actually believes characterizes the economy. The distortions are designed to capture the worst-case outcomes that might face the policymaker. For example, shocks to the inflation rate pose central banks with a particularly difficult policy problem—attempting to limit fluctuations in inflation will lead to increased fluctuations in real economic activity. If such shocks turn out to be very transitory, the problem is not serious; but if the shocks end up lasting longer, the problem is worse. Because persistent shocks are more serious, a policymaker who desires a robust policy will respond to all inflation shocks as if they were going to be persistent, more persistent that he actually expects they will turn out to be (Walsh 2003).

The idea that a central bank would deliberately use a distorted model of the economy raises some troubling issues. The trend in recent years among many central banks has been towards more transparency—providing clearer statements about policy goals and forecasts. It might be difficult to explain policies to the public if they were based on a model of the economy that the central bank knew to be wrong, even if the distortions were designed to yield more robust policies. Another difficulty centers on the role of staff economists and policymakers.

Staff economists would need to know the policymaker's preferences over different macroeconomic outcomes in order to prepare "distorted forecasts" the policymaker would find useful. The staff economists would not be able to present a set of alternatives based on their best estimate of the true model of the economy, letting the policymaker choose from among these alternatives.

While basing policy on an explicitly distorted model of the economy may be undesirable, analyzing worst-case scenarios can be useful as a means of assessing the risks policymakers face. Consider the situation presented by the possibility of a deflation that the central bank views as costly. A central bank not concerned with robustness would assess the costs of deflation and adjust them according to the likelihood that a deflation will occur. If this probability were small, it would have little impact on actual policy choices. In contrast, a central bank concerned with designing a robust policy would assume that, should a negative inflation shock occur, it might turn out to be more persistent than expected, pushing the economy into a serious deflation. It would choose a policy that protects against the possibility that a persistent, negative inflation shock leads to deflation, behaving, in essence, as if the chances of deflation were higher than they actually are. In other words, at the first sign of a negative inflation shock, the central bank would respond *as if* it expected the shock to persist, in order to ensure that a deflation does not occur—*even if* the probability of this worst-case scenario is remote.

Conclusions

Because policymakers face great uncertainty about the future course of the economy, the impact policy actions will have, and what sorts of shocks might hit the economy, they need to weight both the expected outcomes under the chosen policy and the consequences should economic events take unexpected turns. If the costs of upside and downside risks to the economy are asymmetric, prudence calls for precautionary policies designed to reduce the likelihood that the most costly situation develops. Evaluating outcomes in worst-case scenarios can be useful in assessing whether a policy is robust, ensuring that, come what may, things don't turn out too badly.

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