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INTRODUCTION

Monetary policy rules of the type proposed by McCallum (1988) specify a target and an instrument. The monetary authority adjusts the instrument in response to deviations of the target variable from its desired path. The instrument must be under the tight control of policymakers and must be predictably related to the target. The target must be readily observable and reliably linked to some measure or measures of economic well-being. In a recent paper, Judd and Motley (1992) consider two alternative target variables--nominal gross domestic product (nominal GDP) and nominal M2--and two alternative instruments--the monetary base and the federal funds rate. Other papers, by Bennett McCallum (1990) and Judd and Motley (1991), have compared the performance of rules based on nominal-GDP targets to the performance of rules based on price-level targets. I will begin with some comments on issues that arise out of this earlier literature. Later, I will discuss the appropriate strategy for choosing a policy instrument and the potential role of M2 in the policy-making process.

PRICE-LEVEL STABILITY OR ZERO INFLATION?

Changes in the rate of money growth do not appear to have important long-run effects on the path of real output. Whether one wants to include a measure of real output as a target variable governing the direction of monetary policy, then, depends upon whether or not one believes changes in the money supply have a significant near-term impact on economic activity. Those who believe that the

near-term impact of money-supply changes is negligible—or who, like Barro (1986), believe that money-supply changes affect real activity only by interfering with the smooth working of the private economy—typically favor a price-level target. On the other hand, those who take traditional Keynesian models seriously tend to favor a nominal income target. Nominal-income targeting attaches equal weights to the price level and real output as guides to the direction of monetary policy. Simulations suggest that policy rules that target nominal income stabilize inflation nearly as well as rules that target the price level directly. Further, if the economy is assumed to be Keynesian, nominal-income targeting yields a smoother path of real output than does price-level targeting.

Stabilizing inflation is not the same thing as stabilizing the price level, and the desirability of nominal-income targeting has been questioned on the grounds that if real output is not trend-stationary, then targeting a deterministic path for nominal GDP will give rise to a non-stationary price level (Haraf 1986).

I think that nominal-income targeting may be preferable to price-level targeting, even in a world where wages and prices are completely flexible—so that the usual motivation for a Keynesian analysis is missing—and even in a world where output is subject to permanent supply-side shocks—so that nominal-income targeting yields a non-stationary price level. Briefly, my argument is that price-level targeting substantially increases the vulnerability of a real-business-cycle world to the disruptive effects of financial crises.

For concreteness, suppose that the full-employment level of output falls by one-third. Assuming no Keynesian wage or price rigidities, the usual story would be that actual output also falls by one-third, independent of any action that the monetary authority might or might not take. If the monetary authority chooses to maintain a constant price level, nominal income declines by one-third, matching the decline in output.

Consider the impact of these events on borrowers and lenders. Lenders are completely insulated from the output shock, in the sense that the real value of payments on existing loans is entirely unaffected, so that a household deriving all of its income from interest would not see any change in its standard of living. For borrowers, the situation is quite different. The nominal and, hence, the real value of home-mortgage, auto-loan, credit-card, and other obligations is unchanged. Borrowers' discretionary incomes—the incomes they have available to purchase current output—must, therefore, absorb the full force of the declines in borrowers' gross incomes. For example, a household that had been devoting 50% of its gross income to fixed obligations would see its discretionary income fall to only one-third of its pre-shock level. A sufficiently large adverse supply shock could easily drive the discretionary income of some borrowers to **zero**. In any case, if aggregate income falls by one-third, but lenders' living standards are unchanged, then the living standards of borrowers must fall by **more** than one-third.

In much the same way, the real-income **gains** resulting from a

positive supply shock accrue only to borrowers. In general, borrowers bear all the risk related to supply shocks. Lenders bear none of the risk.

While, in theory, it ought to be possible to reallocate risk by making debt contracts contingent upon aggregate supply shocks, such contingencies are rarely observed in practice. Typically, borrowers are offered concessions only if they are facing severe financial distress. Then, loan payments are merely rescheduled, not forgiven. Even rescheduling is difficult to arrange when multiple lenders are involved. In any case, one benefit of price-level stability is supposed to be a simplification of debt contracts. If under a price-level-stabilization rule debts must be indexed to real output, this purpose has been defeated.

As a practical matter, then, adverse supply shocks are likely to hit borrowers disproportionately hard under a price-level-stabilization rule. A series of adverse shocks might well drive borrowers into default, threatening the solvency of financial intermediaries and, so, disrupting capital formation and production. Such disruptions are more likely the larger and more highly autocorrelated are deviations of potential output away from trend. So, it is precisely in a real-business-cycle world—where supply shocks are large and have a substantial permanent component—that the negative side effects of price stability are the greatest threat.

In general, an adverse supply shock has much the same effect on the financial health of an economy with a stable price level as a

comparably sized deflation has on the financial health of an economy with a constant level of potential output.

Under nominal-income targeting—unlike price-level targeting—the real impact of supply shocks is distributed evenly between borrowers and lenders. A one-third decline in potential real GDP is accompanied by a one-third increase in the price level. Consequently, the real value of debt obligations and interest payments also declines by one-third. Borrowers are less likely to be pushed into default than under a price-level-stabilization rule, and the financial system is less likely to undergo stress.

A minor variation on nominal-income targeting—nominal-consumption targeting—has a nice intuitive rationale. If utility is logarithmic in consumption, then holding the nominal value of consumption constant is equivalent to holding the marginal-utility value of money constant.[1] This definition of price-level stability is more appealing than the conventional definition, which holds constant the value of money measured in units of output.

Interestingly, the consumption-capital-asset-pricing model (consumption-CAPM) suggests that nominal interest rates would be constant if nominal-consumption targeting were successfully

1. The marginal-utility value of money is $u'(c)/p$, where c is consumption, p is the price level, and $u(\cdot)$ is the utility function. Assuming logarithmic utility, $u'(c)/p = 1/(p \cdot c)$.

implemented.[2] Empirically, the consumption-CAPM seems to perform better at intermediate and long time horizons than at short time horizons, so we could probably expect a nominal-consumption-targeting rule to stabilize intermediate-term and long-term interest rates more than short-term rates.

To recap, one doesn't have to believe that output is trend-stationary or that prices are sticky in order to believe that some variant of nominal-income targeting is desirable. Even if most recessions have their roots in supply-side shocks, the actions of the Federal Reserve influence how such shocks are propagated through the financial markets and, so, help determine whether the real impact of the shocks is amplified by the disruption of credit relationships. Financial crises have historically been an important contributing factor to the most severe of our economic downturns, and the elimination of these crises was one of the principal motivations for establishing the Federal Reserve System.

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2. According to the consumption-CAPM, the utility derived from spending a dollar today must equal the expected utility derived from saving that dollar and spending the proceeds tomorrow. Thus,

$$u'(c(t))/p(t) = E[u'(c(t+1))/p(t+1)](1 + R(t))/(1 + \rho),$$

where $R(t)$ is the nominal interest rate and ρ is the rate of time preference. With logarithmic utility, this condition becomes

$$1 + R(t) = (1 + \rho)/E[p(t)c(t)/(p(t+1)c(t+1))].$$

So, $R(t) = \rho$ if people expect the ratio of current spending to future spending to equal unity, and, more generally, the nominal interest rate is constant if people expect the ratio of current consumption spending to future consumption spending to be held fixed.

INSTRUMENTS AND INDICATORS

We have seen that, in selecting a target variable, one should use an analytical framework that distinguishes between borrowers and lenders. Likewise, in comparing the performance of various instruments it is essential that one distinguish between inside money and outside money, between currency and reserves, between periods of regulated and periods of deregulated deposit interest rates, and between long-term and short-term interest rates.

A distinction between currency and bank reserves is made necessary by the Federal Reserve's commitment to provide currency on demand. As Hafer, Haslag, and Hein (1992) have pointed out, when combined with a feedback rule for the monetary base, the Federal Reserve's commitment to providing currency on demand can lead to a squeeze on bank reserves. If banks face a binding ceiling on deposit interest rates, any squeeze on their reserves would force a sharp curtailment in lending. Without a ceiling, deposit interest rates would rise, putting upward pressure on the general level of rates. These effects can only be satisfactorily analyzed using a model that includes both inside and outside money and that allows, historically, for a binding Regulation Q.

Long-term interest rates affect investment, short-term interest rates are the rates most directly subject to Federal Reserve control, and the spread between short-term and long-term rates is closely related to the opportunity cost of holding inside money. Consequently, one cannot really hope to adequately model the interplay between the

real and financial sectors—or to say anything convincing about the merits of one policy instrument compared with another—without carefully modeling the relationship between long-term and short-term interest rates. Among other things, this means recognizing that long-term rates are a weighted average of current and expected future short-term rates. If one models long-term rates as a weighted average of current and past short rates, one is leaving oneself open to the Lucas critique.

Before concluding, I will touch upon the potential usefulness of M2 as a target for monetary policy. A case for M2-targeting can be based upon M2's historical tendency to lead movements in income and upon M2's availability on a monthly (even weekly), rather than quarterly, basis. Recent analyses capture the first of these considerations but ignore the second.[3] My own suspicion is that M2 is probably best viewed as an indicator variable or supplementary target variable rather than as a replacement for nominal income in the policy rule. As an indicator or supplementary target, information on M2 could help guide adjustments in the Federal Reserve's chosen policy instrument between quarterly GDP reports. In view of the recent deterioration in standard models' ability to explain its movements, however, caution is required before giving M2 even this limited role.

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3. See McCallum (1990) and Judd and Motley (1992).

CONCLUSION

The idea of an explicit policy rule is appealing. The case for some variant of nominal-income targeting is stronger than has generally been recognized. Until we improve our understanding of the linkages between the real and financial sectors, however, we cannot with any confidence say which of its potential instruments the Federal Reserve should use to keep nominal spending on course. Nor can we with any confidence say what the feedback mechanism linking instrument to target should be. To ask highly stylized macroeconomic models to shed light on the relative merits of alternative instruments and feedback rules, is to push these models beyond the limits of their capabilities.

REFERENCES

Barro, Robert J. (1986), "Recent Developments in the Theory of Rules Versus Discretion," *The Economic Journal* Supplement, pp. 23-37.

Hafer, Rik W., Joseph H. Haslag, and Scott E. Hein (1992), "Evaluating Monetary Base Targeting Rules," unpublished manuscript.

Haraf, William S. (1986), "Monetary Velocity and Monetary Rules," *Cato Journal* (Fall), pp. 641-62.

Judd, John P., and Brian Motley (1991), "Nominal Feedback Rules for Monetary Policy," Federal Reserve Bank of San Francisco *Economic Review* (Summer), pp. 3-17.

_____ (1992), "Nominal Feedback Rules for Monetary Policy: Alternative Operating Procedures and Targets," unpublished manuscript.

McCallum, Bennett T. (1988), "Robustness Properties of a Rule for Monetary Policy," *Carnegie-Rochester Conference Series on Public Policy* 29, pp. 173-204.

_____ (1990), "Targets, Indicators, and Instruments of Monetary Policy," IMF Working Paper WP/90/41.

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