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Office Correspondence

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To Steve Axilrod

Subject: What Price Monetary Stability?

From James L. Pierce

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The staff performs an experiment to determine the costs of erratic money growth. They use Board and St. Louis models. They conclude that short term variations are not important, and that the Fed can focus on other things, like interest rates, in the short term. (Pg. 3)

There has been some debate recently concerning the economic consequences of having erratic rather than steady rates of growth of the money stock. In an attempt to shed light on the issue, simulation exercises were performed with two econometric models -- the Board's quarterly model^{1/} and the model of the Federal Reserve Bank of St. Louis. Details of the results of the simulations are shown in the attached tables, but in very broad terms, the implications are that economic behavior is essentially the same whether money grows at a constant rate or whether money growth fluctuates around that rate for one or two quarters. If the money growth rate wanders off the desired growth path for three or four quarters, however, the deviations in economic performance becomes more noticeable.

The exercise began by running a control simulation for the years 1972 and 1973 in which it was assumed that the Federal Reserve maintained a constant 6 per cent money (M_1) growth path for all eight quarters. The "control" values thus obtained for GNP, real GNP, prices (GNP deflator) and the unemployment rate became a standard for comparison. A series of additional simulations were then run in which

^{1/} The version used here incorporates relatively rapid impacts of monetary change upon the economy (which is also characteristic of the St. Louis model) and thus is more likely to indicate adverse effects of variations in money growth over short periods of time.

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the money stock was assumed to grow at various rates for various time periods. In the initial period, which consisted of an increasing number of quarters, the money stock was assumed to grow at a 10 per cent rate. This was succeeded by a period of 2 per cent rate money growth for the same number of quarters. For the remainder of the two year interval it was assumed that the money stock returned to a steady 6 per cent rate growth path.^{2/} Thus, the average growth rate over the entire two year period was 6 per cent. The values of GNP, prices and unemployment obtained from these various "solution" simulations were then compared to the values of the control simulation. Both models produced similar results (see attached tables for details).

The exercise indicates that the money stock can wander off path for up to two consecutive quarters without materially affecting the expected impact upon the economy. However, sizable effects begin to appear when the money stock fluctuations continue for three or more quarters. By that time, the absolute values of output, prices and employment vary substantially from the values of the variables in the control simulation (in which a steady 6 per cent money growth was maintained). In addition, it then takes considerably longer for the economy to return to the control values. This suggests, then, that a latitude for errors exists for short-term money growth provided that

^{2/} Another series of simulations were run in which the same procedure was followed except that the money stock was assumed to fluctuate from a 8 per cent rate to a 4 per cent rate, and then level out at a 6 per cent rate. The results of this series show the same kind of results as the 10-2-6 series reported above.

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the average growth rate over as long a period as one year equals the desired growth.^{3/} This also implies (with the same caveat) that the Federal Reserve can focus on other target variables -- such as interest rates or disintermediation problems -- for short periods without seriously affecting ultimate economic goals.

The simulation results also point up the fact that because of distributed lags, it takes at least several quarters for monetary policy to work its complete influence on economic behavior. Thus, an instantly effective monetary policy should not be expected. But at the same time, distributed lags make it possible for relatively extreme, but short-lived, policy reversals to be not necessarily disruptive. An easy monetary policy starts a chain of effects in the economy, but if a tight monetary policy is instituted shortly thereafter -- in three to six months -- the uncompleted portion of the chain will be counterbalanced by the new policy. Such vacillations can thus cancel out competing effects and the ultimate impact on the economy

^{3/} This contention is also supported by simulation exercises concerning economic performance in 1971. The money stock actually grew at about a 10 per cent rate in the first half of the year and then at about a 2 per cent rate in the last half, which averages out to about a 6 per cent growth rate for the year as a whole. If the money stock had grown at a constant 6 per cent rate -- instead of vacillating from 10 to 2 per cent -- results of simulations from the Board's quarterly econometric model show that aggregate output would have been only slightly lower (GNP -\$7 billion, real GNP -\$5 billion), price behavior would have been the same, and the differences in the unemployment rate would have been miniscule (.3 per cent higher). [These differences in the economic variables -- small as they are -- are all in the same direction, thus indicating that the economy actually was better off than would have been the case if money growth had been at a steady 6 per cent rate]. Similar simulations using the St. Louis model produced like results.

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tends to be nearly the same as if a steady monetary policy had been followed. In any event, the simulation results suggest that it is desirable to set a money strategy to extend over at least several quarters rather than focusing on month-by-month, or quarter-by-quarter changes.

When looking at the following tables, it is important to remember that some sectors of the economy respond to monetary policy more quickly (and more intensely) than others. For instance, the effects of the fluctuating money stock growths on prices are not fully felt within two years -- the length of the period of the simulation exercise. As a result, the tables appear to show that prices are getting more and more out of hand as the period of erratic money growth lengthens while the other variables -- GNP and unemployment -- first get off track but then converge back towards the control values. In the case of prices, too, the convergence ultimately takes place, but it takes longer than the time period covered by the table.