

# Issues in the Coordination of Monetary and Fiscal Policy

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## I. Introduction and Summary

Now, as often in the past, there are complaints from all quarters about the lack of coordination between monetary and fiscal policy. Indeed, the feeling that monetary and fiscal policies are acting at cross purposes is quite prevalent. This attitude, I think, reflects dissatisfaction with the current mix of expansionary fiscal policy and contractionary monetary policy, which pushes aggregate demand sideways while keeping interest rates sky high. This, too, has frequently been so in the past.

Figure 1 offers a rough impression of the recent history of monetary-fiscal coordination. It plots the change in the high-employment surplus (as a crude indicator of the thrust of fiscal policy) on the horizontal axis and the change in the growth rate of  $M_1$  (as a crude indicator of monetary policy) on the vertical axis for the years 1961-1980. The scatter of points does not leave the impression of a strong negative correlation, as might be expected from well-coordinated policies. But even by these lax standards, the projected points for the early 1980s (falling money growth rates with widening high-employment deficits) will—if realized—be exceptional.

The clear implication of the current debate is that greater coordination between the fiscal and monetary authorities would be **better**. There

I am grateful to Benjamin Friedman, John Taylor, James Tobin, William Poole, and other conference participants for helpful discussions, to Albert Ando and Rick Simes for use of the MPS model, and to the National Science Foundation for financial support.

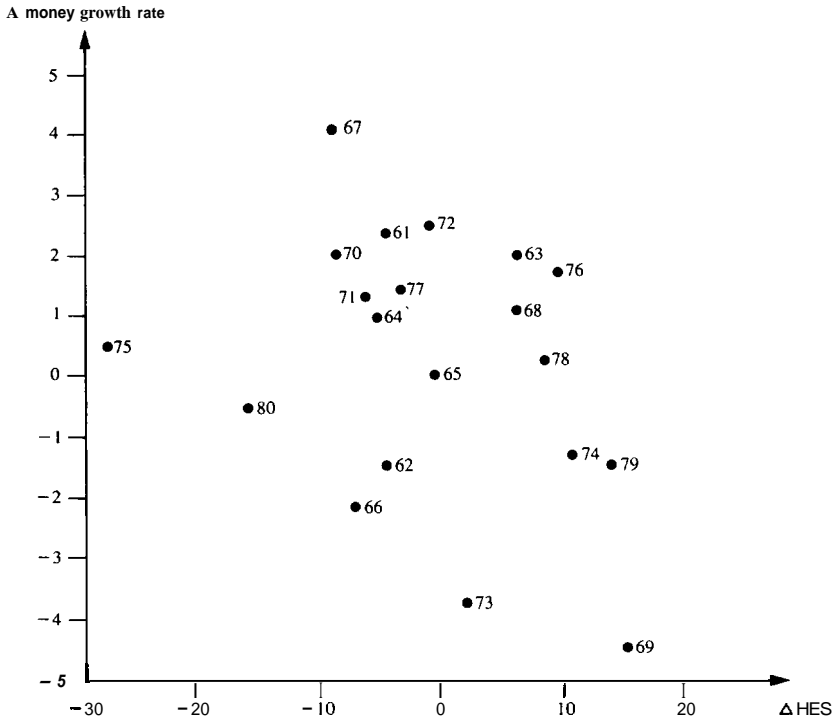


FIGURE 1

is so much unanimity on this point that even an observer as distrustful of government as Milton Friedman (1982) has urged that the Federal Reserve be brought under the control of the administration.

This paper tries to take a fresh look at the coordination issue. Among other things, it raises the possibility that greater coordination might actually make things worse! The paper takes as its objectives to raise questions, to clarify issues, and to stimulate discussion rather than to provide answers. Where answers are suggested, they should not be interpreted as etched in stone.

Section II, which follows this summary, focuses on the potential gains from greater coordination between monetary and fiscal policy. The first part uses the traditional targets — instruments approach to examine the possibility that coordination might not be terribly important because the authorities have more instruments than they need to achieve the goals of stabilization policy. A variety of considerations, however, argue against the empirical relevance of this possibility.

Since greater monetary-fiscal coordination is often equated with looser money and tighter fiscal policy, the second part of this section appeals to two econometric models of the economy to estimate the quantitative importance of the so-called mix issue. The empirical results suggest that the effects of changes in the monetary-fiscal mix may not be as large as many suppose.

The final part of Section II deals with expectational effects that arise from the government budget constraint, here interpreted to state that the current mix of policies has important implications for the range of policy combinations that will be available in the future. I show that the government budget constraint allows more degrees of freedom than some of the recent literature suggests and argue that some authors have overplayed the role of expectational effects which, while present, may not be dominant.

Section III turns to the reasons for lack of coordination and shows that our attitudes toward the non-coordination problem may be quite different, depending on why policies were not coordinated to begin with. Here I argue that there are plausible circumstances under which it may be better to have uncoordinated policies. An analogy will explain why this may be so.

Consider the problem of designing a car in which student drivers will be taught to drive. The car will have two steering wheels and two sets of brakes. One way to achieve "coordination" is to design the car so that one set of controls — the teacher's — can always **override** the other. And it may seem obvious that this is the correct thing to do in this case. But now suppose that we do not know in advance who will sit in which seat. Or what if the teacher, while a superior driver, has terrible eyesight? Under these conditions it is no longer obvious that we want one set of controls to be able to override the other. Reasoning that a stalemate may be better than a violent collision, we may decide that it is best to design the car with two sets of competing controls which can partially offset one another.

Using the two previous sections as background, Section IV discusses alternative fiscal-monetary arrangements ranging from perfect coordination to complete lack of coordination. The focus here is clearly at the "constitutional" level: what kind of coordination system would we like to devise? The game — theoretic aspects of having two independent authorities are stressed, and I offer a general reason to expect that uncoordinated behavior will result in tight money and loose

fiscal policy even when both parties would prefer easy money and tight fiscal policy!

Finally, Section V considers the old "rules versus discretion" debate from the particular perspective of this paper. Rules are viewed as ways to resolve the coordination problem and to alter the fiscal-monetary mix. I conclude that the celebrated  $k$ -percent rule for money growth is unlikely to score highly on these criteria, and suggest two other rules that might do better.

## II. Targets, Instruments, and the Gains from Coordination

### A. *Targets and Instruments*

The traditional targets and instruments approach of Tinbergen and Theil provides a useful framework for thinking about monetary-fiscal **coordination**, because the coordination problem is basically one of an effective shortage of instruments. **Were** there, for example, as many fiscal instruments as targets, the administration might not have to worry about coordinating its actions with those of the central bank.

As we know from Tinbergen and Theil, simply counting up instruments and targets is not enough; we need to know how many independent instruments we have, and this depends on both the model of the economy and the precise list of targets. For example, a plausible set of targets for stabilization policy might be the level of output ( $Y$ ), the price level ( $P$ ), and the share of GNP invested ( $I/Y$ ). If the fiscal instruments are government spending ( $G$ ) and the personal income tax rate ( $t$ ), then, provided that supply-side effects of tax cuts are big enough, we may have just the number of instruments we need—but only if monetary policy is perfectly coordinated with fiscal policy. Lack of coordination will make a suboptimal outcome inevitable.

But what if we add a third fiscal instrument: investment incentives such as accelerated depreciation or an investment tax credit? Then, at least in principle, fiscal policy can go it alone: it can achieve the desired levels of the three targets regardless of what monetary policy does.

Now, the notion that monetary policy is a redundant instrument may not sit well within the Federal **Reserve** System. Nor should it, for there surely are additional targets. For example, we may want to shift the mix of investment spending away from housing and toward business fixed investment. To this end, we may want to keep interest rates high to discourage residential construction while simultaneously providing

strong tax incentives for industrial capital formation. In fact, precisely this policy mix has been advocated by Feldstein (1980a) and others and appears to have been put in place by the Reagan administration.' A second example is the foreign exchange rate which is strongly influenced by the level of short-term interest rates and hence by central bank behavior.

The likelihood that we have surplus instruments at our disposal is further diminished by a number of other considerations. One is that there may be many more targets than the three traditional ones. For example, the use of tax-and-transfer policies may also be influenced by important distributional and allocative objectives. The same may be true of government expenditures; and defense spending involves a host of other complex criteria. In addition, the mix between monetary and fiscal policy may be influenced by regional or sectoral objectives, or perhaps just by a desire not to force one region or sector to bear too much of the burden of stabilization policy. For example, a desire not to devastate the housing industry may be a reason not to rely entirely on restrictive monetary policy to limit aggregate demand. Like fiscal policy, monetary policy also has important allocative effects.

In fact, the situation is a good deal worse than this because the instruments themselves may be targets. It may be, for example, that the government has an explicit objective for the ratio of  $G/Y$  which limits the use of  $G$  as a stabilization tool. Or perhaps sizable movements in policy instruments entail significant costs of their own — costs which preclude moving all the way to the global optimum.

Timing considerations make it still less likely that we have more instruments than we need. Policy instruments like  $G$  and  $M$  may have rather different effects on target variables in the short and long runs. For example, both probably have strong (and rather similar) effects on unemployment in the short run, but little if any effects in the long run. This makes it crucial to coordinate monetary and fiscal plans as they unfold through time.

Uncertainty may also reduce the effective number of instruments. For example, we may feel less uncertain about the effects of particular monetary-fiscal combinations than we do about the effects of individual instruments in isolation. If so, then coordination becomes that much more critical.

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1. The irony of having such a subtle policy mix advocated by those who deride "fine tuning" is almost overwhelming.

The conclusion seems to be that, while it is logically possible that we have more instruments than we need, the real world seems to be characterized by a shortage of instruments in the relevant empirical sense. Consequently, we should expect failure to coordinate fiscal and monetary policy to lead to losses of social welfare.

### ***B. The Capital-Formation Issue***

As I mentioned at the outset, concern that our current policy mix will prove damaging to capital formation seems to be the potential loss of social welfare that is at the heart of contemporary worries about monetary-fiscal coordination.

Because of their effects on investment, each of the tools of demand management also has long-run implications for aggregate supply. Put most simply, fiscal expansion probably pushes up real interest rates, thereby inhibiting capital formation and slowing the growth of aggregate supply. Monetary expansion should have the opposite effects on interest rates and investment. Therefore, it is argued, a tighter fiscal policy and a looser monetary policy would provide a climate more conducive to investment and growth. But just how large are these effects in practice?

To get a serious quantitative answer, I see no place to turn but to the much-maligned large-scale econometric models. Otto Eckstein and Christopher Probyn (1981) recently reported the results of a simulation exercise with the DRI model in which the actual fiscal and monetary policies of the 1966-1980 period were replaced by a mix of policies less expansionary on the fiscal side and more expansionary on the monetary side.

The period in question was one in which DRI's version of the full-employment deficit averaged about \$27 billion, varying between about zero and \$64 billion. In the alternative scenario simulated by Eckstein and Probyn, the full-employment budget was roughly balanced every year, and monetary policy (defined by nonborrowed reserves) was adjusted to maintain approximately the same time path for the unemployment rate. How different would the economy's evolution have been under this alternative monetary-fiscal mix?

According to the DRI model, the investment share in GNP would have been about one-half percentage point higher in a typical year of the simulation, leading to a cumulative increase in the capital stock over the 15-year period of about 5.3 percent. As a consequence,

potential (and hence actual) real GNP in 1980 would have been about 1.6 percent higher than in the historical record. The GNP deflator in 1980 would have been 2.6 percent lower, which translates to an average reduction in the annual inflation rate of about 0.2 percentage points.

As Robert Solow once remarked, the nice thing about large-scale econometric models is that they always have an answer for every question. What we want to know, of course, is whether the DRI model's answer to this particular question is roughly correct. This, unfortunately, is unknowable. The next best thing is to get another large-scale model to answer the same question, and then compare the responses. Fortunately, Albert Ando kindly volunteered to run more or less the same policy change on the MPS model. Some modifications had to be made because of the different structures of the two models. (Examples: Neither full-employment GNP nor the full-employment deficit is a variable in the MPS model; the simulation period was 1967-1981 instead of 1966-1980.) But an effort was made to come as close as possible to duplicating the Eckstein-Probyn policy of tighter budgets and looser money with no effect on unemployment.

The MPS results were generally less sanguine about the potential gains from a switch in the policy mix. For example, the share of business fixed investment in GNP was only about 0.3 percentage point higher in a typical year of the easy-money, tight-fiscal simulation with the MPS model. Correspondingly, the gains in real output were smaller: real GNP in the final year of the simulation was just 1 percent higher (versus 1.6 percent with the DRI model).

Bigger differences emerged on the price side of the model. Whereas the DRI simulation said that the GNP deflator would be 2.6 percent lower by the end of the 15-year period, the MPS model put the deflator 0.5 percent higher. The difference here seems to stem from the divergent behavior of the money supply in the two models. According to the DRI model, the "easier money" policy actually leads to a slightly lower money supply, whereas the MPS model shows the money supply increasing slightly.

Beauty is in the eye of the beholder. But these effects, while generally favorable, seem quite modest to me, especially when you realize that the swing in fiscal policy was extremely substantial. Under the historical stabilization policy mix, the cumulative increase in the national debt during this 15-year period was more than \$350 billion for

**DRI** and about \$450 billion for **MPS**. Under the hypothetical policy with a balanced full-employment budget, the debt would have declined by about \$45 billion according to **DRI** and by about \$19 billion according to **MPS**.

Thus, according to these models, an enormous change in the policy mix would have caused only a modest increase in real output. And the two models cannot even agree on whether prices would have increased or decreased as a result.

### *C. The Government Budget Constraint and Expectations*

Dynamic constraints across choices of policy mixes arise from the so-called government budget constraint, the accounting identity that insists that every budget deficit must be financed by selling bonds either to the public or to the Fed. This identity points out that today's fiscal-monetary decisions have implications for the number of bonds that will have to be sold to the public today, and thus for the feasible set of fiscal-monetary combinations in future periods.<sup>2</sup>

For example, suppose an expansionary fiscal policy today leads to a large deficit that is not monetized. Future government budgets will therefore inherit a larger burden of interest payments, so the same time paths of **G**, **t**, and **M** will lead to larger deficits. What will the government do about this? That depends on its reaction function. For example, large deficits and high interest rates might induce greater monetary expansion in the future (the possibility emphasized by Sargent and Wallace, 1981). Alternatively, it might induce future tax increases (the case stressed by Barro, 1974), or cuts in government spending (the apparent hope of Reaganomics). Yet another possibility is that the government will simply finance the burgeoning deficits by issuing more and more **bonds**.<sup>3</sup>

All of these are live options and have different implications for the long-run evolution of the economy. In fact, under rational expectations, they may have different **implications** for the current state of the economy.

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2. The former has been stressed by, among others, Christ (1968) and Blinder and Solow (1973). The latter has been stressed by, among others, Auerbach and Kotlikoff (1981) and Sargent and Wallace (1981).

3. The stability of the economy under this last policy has been called into question. More on this later.



Consider, as an example, the effects on consumer spending of a tax cut financed by issuing new bonds. Such a tax cut today enlarges current and prospective future budget deficits, thereby requiring some combination of the following policy adjustments:

1. increases in future taxes;
2. decreases in future government expenditures;
3. increases in future money creation;
4. increases in future issues of interest-bearing national debt.

To the extent that the current decisions made by individuals and firms are influenced by their expectations about the future, each of these alternatives may have different implications for the effects of the tax cut today.

For example, if people believe that a tax cut financed by bonds simply reduces today's taxes and raises future taxes in order to pay the interest on the bonds, then consumption may not be affected. This is essentially Barro's (1974) argument.

Alternatively, people may believe that the policy will eventually lead to greater money creation. If so, the inflationary expectations thereby engendered may affect their current decisions in ways that are not captured by standard behavioral functions. This is essentially the point made by Sargent and Wallace (1981) in arguing that tight money may be inflationary.

Still different reactions would be expected if people thought the current deficit would lead to lower government spending or to more bond issues in the future. The theoretical possibilities are numerous, limited only by the imagination of the **theorist**.<sup>4</sup>

Rational expectations interact with the government budget constraint in an important way. People's beliefs about the future consequences of current monetary-fiscal decisions are conditioned by their views of the policy rules that the authorities will follow. To the extent that these beliefs affect their current behavior, different policy rules actually imply different short-run policy multipliers under rational expectations.

A key question for policy formulation is: how important are these expectational effects in practice? This seems to depend principally on

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4. For a more detailed discussion of this issue, see Feldstein (1982).

how forward-looking current economic decisions really are. Take the tax cut example again. Under the pure permanent income hypothesis (PIH) only the present discounted value of lifetime after-tax income flows affects current **consumption**.<sup>5</sup> So expectations about future budget policy should have important effects on current consumption. But if short-sightedness, extremely high discount rates, or capital market imperfections effectively break many of the links between the future and the present, then current consumption may be rather insensitive to these expectations and rather sensitive to current income. Even under fully rational expectations and the pure PIH, consumption may depend largely on current income if the stochastic process generating income is highly serially correlated. These are issues about which knowledge is accumulating; but much remains to-be learned. The evidence to date does not lead to the conclusion that long-term expectations rule the

The other two places where expectations about future fiscal and monetary policies might have significant effects on current behavior are wage and price setting and investment.

Investment, of course, is the quintessential example of an economic decision which is strongly conditioned by expectations about the future. Even Keynes knew this! But, once again, there are some real-world considerations that interfere with the strictly neoclassical view of investment as the unconstrained solution to an intertemporal optimization problem. One is that capital rationing may interfere with a firm's ability to run current losses on the expectation of future profits. A second is that management may use ad hoc rules such as the payback period criterion in appraising investment projects. A third is that management may be more shortsighted than it "should be." A fourth is that there may be — and probably is — a strong accelerator element in investment spending, which ties the current investment decision much more tightly to the current state of the economy than neoclassical economics recognizes. As in the consumption example, each of these things diminishes the importance of the future to current decision making and thereby renders expectational effects less important.

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5. Indeed, under the hypothesis advanced by Barro (1974) — that each generation has an operative bequest motive based on the next generation's lifetime utility — the period from now to the end of time is relevant.

6. See, for example, Blinder (1981), Hall and Mishkin (1982), Hayashi (1982), or Mankiw (1981). Bernanke (1981) is more optimistic about the PIH.

Wage and price setting is another important example. Ad hoc rules which adjust wages or prices in accordance with "the law of supply and demand," or which are mainly backward looking, render expectational effects rather unimportant. But rules which are based on forward-looking considerations (such as expected future excess demand) make expectational effects crucial. Again, this is an area where we must learn much more before we can make any definitive judgments.'

A word on uncertainty seems appropriate before leaving this topic. It seems to me that people probably attach great uncertainty to their beliefs about what future government policies will be. If so, the means of their subjective probability distributions may have far less influence on their current decisions than the contemporary preoccupation with rational expectations would suggest. For example, how much influence does the two-week-ahead weather forecast have on your decision about whether or not to plan a picnic on a given date?

Similarly, the importance of expectations for macroeconomic aggregates is diminished by the likelihood that different people hold different expectations about what future government policies are likely to be.<sup>8</sup> If some people believe today's tax cuts signal higher future taxes, some believe they signal higher future money creation, and some believe they signal lower future government spending, then expectations about the future may have meager current effects in the aggregate.

The conclusion seems to be that, while we should not forget about expectational effects operating through the government budget constraint, neither should we get carried away by them. There is no reason to believe that they are the whole show.

### **III. Reasons for Lack of Coordination**

Is more coordination necessarily better? At first blush, this question seems to admit only an affirmative answer. But further reflection suggests that things are not quite so clear.

If the central bank and the government agree on what needs to be done, but a coordinated approach cannot be promulgated because of

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7. For an interesting discussion of forward-looking versus backward-looking wage contracts and how we might distinguish between them empirically, see Taylor (1982b).

8. Divergent expectations have been emphasized recently by, among others, Phelps (1981) and Frydman (1981).

perverse behavior by one of the two authorities, then it is clear that coordination must improve things. Indeed, the type of coordination we want is also clear: the sensible policymaker must dominate the perverse one. Would that things were so simple!

So let us ask why, in reality, fiscal and monetary policies are sometimes so poorly coordinated. If we assume that both authorities are basically sensible, then lack of coordination can stem from one of three causes (or, of course, from combinations of the three):

1. The fiscal and monetary authorities might have different objectives; i.e., different conceptions of what is best for society.
2. The two authorities might have different opinions about the likely effects of fiscal **and/or** monetary policy actions on the economy; i.e., they might adhere to different economic theories.
3. The two authorities might make different forecasts of the likely state of the economy in the absence of policy intervention. Divergent forecasts could result either from different economic theories (as in **2** above) or from different forecasts of exogenous variables.

In each case, if we were certain about which of the two authorities was correct, then we would know what to do about the coordination problem. We would simply put all the policy levers in the hands of the authority with the proper objective or correct theory or accurate forecast, just as we would want the instructor, not the student, to have ultimate control over the learn-to-drive car.

But, in fact, we rarely know this in any particular case. And we certainly have no basis for setting out a general, constitutional rule predicated on one or the other authority "always" being right. As a consequence, we may conclude, as in the student driver example, that the best strategy is to give some power to each authority, but at the same time to give each some ability to cancel out the actions of the other.

Let us examine each of the three possible reasons for lack of **coordination** in turn, using the simple targets-instruments framework. To keep the discussion as elementary as possible, I assume (for this section only) that there are two targets and two instruments.

### **A. A Framework**

In Figure **2** there are two targets: the gap between actual and potential real output ( $y - y^*$ ), which serves as a proxy for both **unem-**

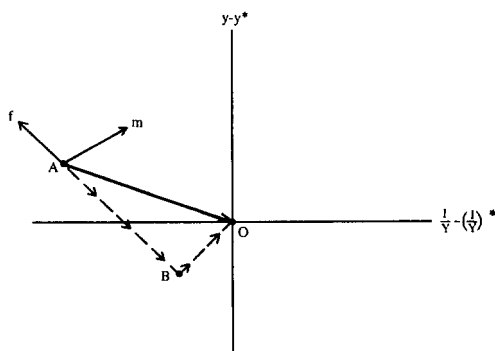


FIGURE 2

ployment (via Okun's law) and inflation (via the short-run Phillips curve), and the share of investment in GNP ( $I/Y$ ). Similarly, there are two instruments: monetary and fiscal policy. Point A indicates the position which the economy is forecast to attain if neither policy instrument is changed. If the origin is interpreted as the global optimum, then real output is too high and the investment share is too low.

The vectors  $m$  and  $f$ , emanating from point A, indicate the effect of a unit expansionary move of the monetary and fiscal instrument, respectively. Expansionary fiscal and monetary policies each raise output (thereby lowering unemployment and raising inflation), but monetary expansion raises investment while fiscal policy expansion lowers it. The line from A to  $O$  shows that a fully coordinated fiscal and monetary plan can in this case achieve the global optimum. And the dotted lines from A to B and from B to  $O$  indicate the two pieces of the coordinated policy plan: fiscal restriction pushing the economy from A to B and monetary expansion pushing from B to  $O$ .

Having outlined this ideal situation, let us now consider the various reasons for lack of coordination.

### ***B. Different Objectives***

First, assume that the monetary and fiscal authorities agree both on the relevant economic theory and on forecasts for all the **important** exogenous variables. They disagree only over the objectives of economic policy.

Figure 3 adds one new wrinkle to Figure 2. The target of the fiscal authority is assumed to be point  $F$ , while the central bank wants to push

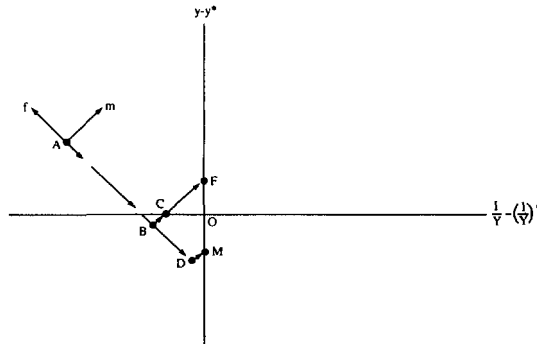


FIGURE 3

the economy to point M, which has a lower level of real activity, instead. If the administration is given control over both instruments, then point F will result along the path ABF. But if the central bank is dominant, then point M will result along the path ADM. Monetary policy will be less expansive and fiscal policy more restrictive.

But what will happen if neither authority is in complete control? That is difficult to say. One possibility — though certainly not the only one — is that the central bank will put the monetary portion of its optimal plan (line DM) into effect while the government follows the fiscal portion of its own optimal plan (line AB). This is certainly an instance that we would call "lack of coordination." But is the outcome so bad?

Figure 3 shows that the economy will reach point C, which is a kind of compromise between point F (the administration's target) and point M (the Fed's target). If the true social optimum — whatever that means! — remains point O, then the "uncoordinated" outcome may conceivably be superior to either of the two "coordinated" outcomes.

But, you may object, would it not be better still if the fiscal and monetary authorities jointly agreed to pursue point O? Of course. But this objection misses the point. When there is true disagreement about what best serves the commonweal, how can we expect a joint decision to be reached except as a political compromise? And why should we think this political compromise will be any better than point C?

The solution, of course, is simple to state and impossible to achieve. We want policymakers to agree on truly optimal targets and then to

pursue them in a coordinated manner. But this is a counsel of perfection which gives us no guidance in any particular instance. If fiscal and monetary policymakers agree to pursue inappropriate goals, the policy we get, while well coordinated, may leave us unhappy.

**C. Different Models of the Economy**

Similar issues arise if the Fed and the administration agree on the objectives and the forecasts, but disagree about how fiscal and monetary instruments affect the economy. To cite a not-too-hypothetical example, suppose a supply-side administration believes that it can expand the economy by tax cuts without harming investment while a monetarist central bank believes that deficits crowd out private investment.

Figure 4 depicts what may happen in such a case. The fiscal authority believes that movements of the two instruments in the expansionary direction have the effects indicated by vectors *t* (tax cut) and *m* (money supply increase). Its optimal plan shoots for point *O* by combining expansionary monetary policy (line *DO*) with a tax hike (line *AD*). But the monetary authority believes the relevant policy multipliers are as indicated by vectors *t* and *m*, and so feels that path *ABO* is the way to reach point *O*. Along *ABO*, fiscal policy is less contractionary and monetary policy is less expansionary than along *ADO*.

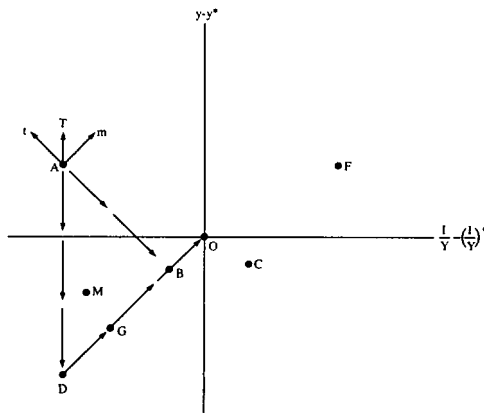


FIGURE 4

What will happen? Once again there are many possibilities. If the fiscal authority's concept of the optimal plan is promulgated, we will get point **O** if its model is correct but point **F** if the Fed's model is correct. On the other hand, if the Fed's optimal plan is accepted, we will get point **O** if it has the correct model but point **M** if the administration's model is correct.

An "uncoordinated" system, in which the Fed pursues its version of optimal monetary policy while the administration pursues its version of optimal fiscal policy, leads to point **C** if the Fed has the correct model and point **G** if the government has the correct model. Coordination is obviously better only if a probability blend of points **O** and **F** (representing domination by the fiscal authority) or of points **O** and **M** (representing domination by the monetary authority) is clearly superior to a probability blend of points **C** and **G**. It is by no means inevitable that this must be true.

#### *D. Different Forecasts*

The case in which the fiscal and monetary authorities agree on both the goals for economic policy and the model of the economy — a remote possibility, it must be admitted — requires no further analysis. Since it is the discrepancies between the targets and the state the economy would attain with no change in policy that really matter, the formal analysis of the case of different targets applies here directly. We need only read Figure 3 backwards and view **ABF** and **ADM** as two paths that emanate from different initial points but lead to the same terminal point.

As before, the principle is obvious but impossible to implement: we want to give all the power to the policymaker with the correct forecast. Good luck! Alternatively, if neither policymaker has a monopoly on knowledge, we want a weighted average forecast with appropriate weights. But who decides on the weights, gets both authorities to use them, and then makes sure that neither party shades his forecast to make the weighted average come out more to his liking?

#### *E. Conclusion*

Where does all this leave us? It seems that whenever fiscal and monetary policy appear to be uncoordinated we must ask ourselves: who is right? If there is one clearly correct policymaker, then the right thing to do is to achieve coordination by giving it control over all the



policy levers. But if this is not the case, as it often will not be, we are left with no clear a priori argument that more coordination is better.

This should not be a foreign notion in a country that has always prided itself on its constitutional system of checks and balances. Dispersion of power is one safeguard against misuse of power, in economic policy as elsewhere. We know that checks and balances can sometimes lead to stalemate or to conflicts between different branches of government, but in many cases we view this as a reasonable price to pay for protection against abuse of power. Is economic policy so different?

One plausible viewpoint is that the fiscal authorities, being elected officials, have the right social welfare function, and so their targets for policy should be accepted. This seems a tenable attitude in a democracy. But consider the following possibility. Suppose the body politic, in its 1914 wisdom, realized that the President and Congress would be unduly swayed by short-run considerations, and so created the Fed as a counterweight to make sure that the long run did not get ignored. Then we might not want to accept blithely the social welfare function of each newly-elected administration.

Besides, even if we accept the validity of the administration's objectives, we are still in a muddle over what to do if we simultaneously believe that the Fed has a better model of the economy and is better (or at least more honest) at forecasting. Can we then force the Fed to reveal its model and forecasts to the administration? Freedom of information argues that we should try, but past experience suggests that we may not succeed. But in any case, how can we be sure that the administration will accept the Fed's model of the economy?

I think we must face up to the obvious, though uncomfortable, conclusion. When no one can be sure what is the right thing to do, no one can ensure us that a unified fiscal-monetary policy authority will do better than the two-headed horse we now ride.

#### **IV. Alternative Models of Coordination**

With the previous two sections as background, this section considers a variety of models of fiscal-monetary coordination (or lack thereof). Two questions occupy our attention here: What kinds of outcomes are likely to arise from alternative interrelationships between the fiscal and monetary authorities? And are these outcomes socially attractive or not? The focus in this section is clearly at the "constitutional" level,

that is, not the kinds of coordination mechanisms, if any, we would like to put in place.

### *A. A Single, Unified Policy Maker*

At one end of the spectrum is the case of a single, unified stabilization authority with control over all the relevant instruments, whether fiscal or monetary. This system could most plausibly be achieved in the United States (and in other democracies) by subordinating the central bank to the administration, as in Friedman's (1982) **suggestion**.<sup>9</sup> But whether this would be a better system than what we have now depends on **the** considerations outlined in the previous two sections.

- (1) How severe is our shortage of instruments in the relevant empirical sense? The greater the shortage, relative to the targets we are pursuing, the greater the potential gains from better coordination.
- (2) How uncertain are we about the proper goals and methods of stabilization policy and about which of the two authorities has sounder views on these questions? The greater the uncertainty, the more risky it is to put all our eggs in one basket.

On balance, it is far from clear that these considerations lead to support for Friedman's suggestion. If we take output (or unemployment), the price level (or the inflation rate), and the fraction of GNP invested as the three principal target variables, then the shortage of instruments may not be a serious one. As pointed out in Section II, the fiscal authorities can, in principle, use control over government purchases, personal income tax rates, and investment incentives, such as depreciation allowances and the investment tax credit, to push all three of these target variables to their desired levels, regardless of what monetary policy is doing. It may be that **the** more serious coordination problem is getting the **disparate** elements of the fiscal team to work together.

On the other hand, it would seem that uncertainty about which policies are best is pervasive in these days of macroeconomic agnosticism. Debates over the appropriate goals for policy and the effects of policy changes on the economy are perhaps more heated now than at any time since the early days of the Keynesian revolution. While my

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**9. It is hard to conceive of the other route: putting all the fiscal policy instruments in the hands of the central bank.**

own feeling is that the extent of contemporary agnosticism is not quite merited by the evidence, this is a minority view. And I rather doubt that we would want a constitutional convention today to place all authority over macroeconomic policy in the hands of either the devoutly supply-side administration or the putatively monetarist Federal Reserve.

It seems unlikely that the model of a single, unified monetary-fiscal authority is descriptive of actual policy making arrangements in the United States. The only econometric study of fiscal-monetary coordination in the U.S. that I know of, by Goldfeld and myself (1976) some years ago, concluded that "the abstraction of a single authority conducting stabilization policy in the United States is just that — an abstraction with little or no empirical validity" (p. 792). Using the MPS model to assess the effects of policy on real GNP, we found a slight positive correlation between the effects of fiscal and monetary policy over the whole 1958-1974 period. But this was the net result of a substantial positive correlation while Republican presidents were responsible for fiscal policy and a negative correlation during the Kennedy-Johnson years.

One final observation on the fully-coordinated case is pertinent in this contest. A single, unified policymaker with an entire portfolio of fiscal and monetary instruments to manage may find it optimal to couple expansionary monetary policy with contractionary fiscal policy, or vice versa, just as an investor may find it optimal to buy one share long and sell another short.

Thus, the fact that we sometimes see fiscal and monetary policy tugging aggregate demand in opposite directions is not evidence that the two policies are uncoordinated. For example, Figure 2 offered an example in which a properly coordinated policy package requires contractionary fiscal policy and expansionary monetary policy. While the example is a simple one of certainty and an equal number of targets and instruments, the basic lesson is probably very robust and holds — though not so sharply — in an uncertain world with a shortage of instruments. It suggests that policy may sometimes appear uncoordinated when it is not.

This point is neither academic nit-picking nor a theoretical *curiosum*. For example, the policy mix that many economists advocate right now combines a more expansionary monetary policy with a more contractionary fiscal policy in the coming years: This is offered as an example of well coordinated monetary and fiscal policy while the

current policy mix (tight money with loose fiscal policy) is supposed to illustrate lack of coordination. Clearly, coordination does not imply correlation.

### *B. Two Uncoordinate Policymakers*

At the opposite end of the coordination spectrum comes the case of two independent authorities, one in charge of fiscal policy and the other in charge of monetary policy, with neither one dominating the other. This model may approximate actual policymaking arrangements in the contemporary United States.<sup>10</sup>

When the two policymakers are at loggerheads, a policy mix of tight money and loose fiscal policy frequently results, with deleterious effects on interest rates and investment.<sup>11</sup> What outcome does theory lead us to expect when fiscal and monetary policy are in different hands and the two parties cannot (or do not try to) reach agreement?

A natural way to conceptualize this situation is as a two-person non-zero-sum game. And a natural candidate for what will emerge, it seems to me, is the Nash equilibrium.<sup>12</sup> Why the Nash equilibrium? Both policymakers understand that they do not operate in a vacuum. Each presumably understands that he is facing an intelligent adversary with a decision making problem qualitatively similar to his own. Furthermore, this is a repeated game; each policymaker has been here before and assumes that he will be here again. It seems natural that each would assume that the other will make the optimal response to whatever strategy he plays. If so, each will probably play his Nash strategy.

Let us see how the Nash equilibrium works out in a moderately realistic example. (See the payoff matrix in Figure 5.) I assume that each policymaker has two available strategies: contraction or expansion. I also assume that they order the outcomes differently, but know each other's preference ordering. Specifically, the fiscal authority

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10. In reality, things are more complicated still because the President and Congress often disagree over national economic policy. A model of three stabilization authorities may be better.

11. The opposite policy mix — tight budgets and easy money — while conceivable, seems to be rarely encountered.

12. The Nash equilibrium concept is defined as follows. Each player does what he would if he knew what the other player was going to do. It is an equilibrium in the sense that the two resulting strategies are consistent with one another; once the game is played, neither player has any desire to change his decision. Not all games have a unique Nash equilibrium. The fiscal-monetary game to be considered here does.

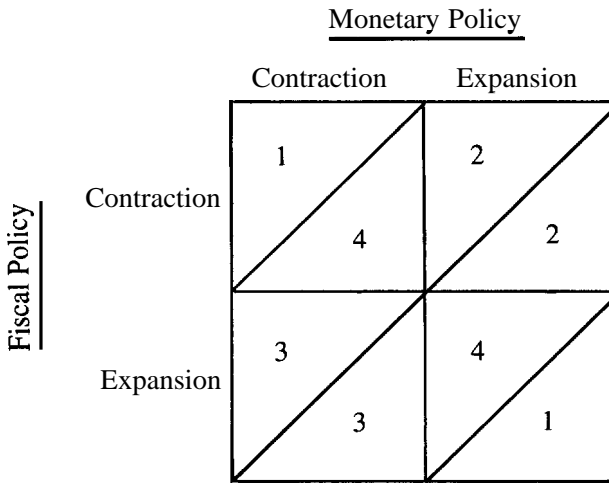


FIGURE 5

(whose preference ordering appears below the diagonal in each box) is assumed to favor expansionary policy. From its point of view, the solution where both play "expansion" is best (rank 1) and the solution where both play "contraction" is worst (rank 4). The monetary authority (whose ordering appears above the diagonal) wants to contract the economy to fight inflation, and so orders these alternatives in the opposite way. However, as between the two outcomes which combine expansion and contraction, I assume that the two players agree that easy money with a tight budget is a better policy mix than tight money with a loose budget.

This explains the entries in the payoff matrix (Figure 5). Now where is the Nash equilibrium? If the Fed plays "expansion," the Administration will also play "expansion," and the Fed will wind up with its least-preferred outcome (the lower righthand box). So the Fed will play "contraction." Knowing this, the Administration's best strategy is "expansion," so the outcome will be the lower lefthand box. Clearly, this is the only Nash equilibrium for this game. It also seems to be the most plausible outcome of uncoordinated but intelligent behavior.

But notice something interesting about this outcome. Both the Fed and the fiscal authority agree that the upper righthand box — easy money plus tight fiscal policy — is superior to the Nash equilibrium. Under full monetary-fiscal coordination, they might well select this

policy mix. But, if they cannot reach an agreement, then the Nash equilibrium — a Pareto-inferior outcome — is likely to arise. Here is a case in which some degree of coordination — at least enough to avoid the inferior Nash equilibrium — is better than none even if we cannot decide which authority has the right social welfare function.<sup>13</sup>

If this example is typical, then switching from a system of two uncoordinated policymakers to one with a single, unified policymaker might yield substantial gains. And there is good reason to think that it is typical, because Nash equilibria in two-person non-zero-sum games are very often not Pareto optimal.

The problem, of course, is that achieving greater coordination is more easily said than done. The two authorities have reasons for disagreeing — reasons which may not be easily ironed out. However, this example illustrates that full coordination (which is probably impossible in any case) may not be critical. What we need in this case is no more than an agreement to consult with one another enough to avoid outcomes that both parties view as inferior. Maybe this is not too much to ask.

However, things become far less clear if one policymaker lacks knowledge of either the preferences or the economic model of the other. Then there is no particular reason to think the Nash equilibrium will result, and other solutions become equally plausible. For example, each player may simply pursue his global optimum, ignoring-the decision of the other.<sup>14</sup> There are other possibilities as well.

### *C. Leader-Follower Arrangements*

An alternative model of fiscal-monetary coordination, intermediate between the two extremes, is a leader-follower arrangement according to which policymaker A goes first and then policymaker B decides what to do in view of the prior decision by A.

This scenario may sound moderately descriptive of current U.S. institutions in that fiscal policy first determines the budget deficit and then monetary policy decides how much of this deficit to monetize. However, things are a bit more complicated because monetary policy

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13. The example analyzed here is a case of what game theorists call the Prisoners' Dilemma.

14. In the simple example of Figure 5, this pair of strategies also leads to the Nash equilibrium. But this is not generally true. A more complicated example in which the Nash and other alternative solutions differ is offered in the Appendix.

decisions are made much more frequently (monthly?) than fiscal policy decisions (annually?), so sometimes the Fed is the leader.

Under a leader-follower arrangement, the follower runs the show, albeit subject to some constraints placed on him by the leader's prior decision. If the follower has enough instruments at his disposal, these constraints may not be binding. In this case, the leader-follower system is equivalent to having a single stabilization authority (the follower). But if the follower does not have enough instruments, then the constraints imposed by the leader are real ones and may preclude the attainment of the (follower's) first-best optimum.

For this reason, the leader-follower system may work very differently depending on whether the Fed or the **government** is the leader. I have noted above that, at least in principle, a fiscal authority interested in targeting  $y$ ,  $P$ , and  $I/Y$  can achieve its aims regardless of what monetary policy does. Under these ideal circumstances, the leader-follower system with the Fed as leader is equivalent to giving full control to the fiscal authorities.

However, the central bank enjoys no such luxury. Its three traditional instruments (reserve requirements, open market operations, and discount policy) probably give it only one independent instrument for stabilization purposes. If so, a leader-follower arrangement with the Fed as follower is not at all equivalent to vesting full control in the Fed. This asymmetry, it seems, is something of which the Fed is fully aware. It may be why Chairman Volcker smiles so infrequently.

Even without this asymmetry, the outcome will depend on who leads and who follows. Suppose, first, that the fiscal authority is the leader. It sets government spending, taxes, and transfers where it wants them, in full knowledge that these decisions will evoke some response from the Fed. In the case of the simple game in Figure 5, the administration can predict with confidence that the Fed will play "contraction" regardless of the fiscal-policy decision. So it will surely play "expansion." We get the Nash equilibrium once again.

By a similar line of reasoning, it is easy to see that the same Nash equilibrium will **arise** if the Fed is the leader and the administration is the follower. However, this is not a general result. In general, the two leader-follower solutions are different, and each differs from the Nash equilibrium.<sup>15</sup>

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15. See the example in the Appendix.

Under a leader-follower arrangement, the follower's attitudes clearly influence the leader's decision because when the leader makes his decision he takes into account the anticipated response of the follower. For example, fear of the high interest rates that the Fed might cause probably led Congress to adopt a less expansive budget this year than it otherwise would have chosen.

In a dynamic framework, still more possibilities for policy interactions arise. The follower knows, for example, that his decision in period 1 will influence the circumstances facing, and thus the decision made by, the leader in period 2. He will probably take this into account in making his period 1 decision.<sup>16</sup> At least potentially, this dynamic interaction can reduce the loss from lack of coordination by getting the leader to adopt policies more in tune with the objectives of the follower. Continuing the same example, by keeping a tight rein on credit the Fed exercises a kind of discipline (albeit a minor one) over fiscal policy so long as Congress abhors high interest rates and believes that deficits will not be monetized at the margin. This pushes fiscal decisions more in the direction favored by the Fed. The follower is not a toothless tiger even if he has but one instrument and many targets.

#### ***D. One Party Follows a Non-Reactive Rule***

One way for the leader to avoid being manipulated by the follower is to adopt a non-reactive policy rule, such as the famous k-percent rule for monetary policy. The key word here is not "rule" but "non-reactive." If the Fed (the follower) knows that the government (the leader) is following a fiscal rule that reduces spending whenever interest rates rise, it can induce the government to cut spending by pushing up interest rates. But no such possibilities arise if the government follows a non-reactive rule.

While many fiscal rules (balancing the budget, balancing the high-employment budget, etc.) have been suggested, none of them seem to be non-reactive. No one, to my knowledge, has advocated a k-percent rule for government spending or for tax receipts, though some of the suggestions for constitutional restraints on spending come close."

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16. And, of course, the leader understands this when he makes his period 1 decision! No wonder game theory is so hard.

17. Indeed, it may be possible to view the Reagan economic program as a non-reactive fiscal rule that will cut the ratios of government spending and tax receipts to GNP, regardless of the consequences for interest rates, unemployment, and inflation.



However, the most frequently suggested rule for the conduct of monetary policy is non-reactive. And the desire to free the Fed from the pressure to monetize budget deficits may be one of the major motivations behind this rule.

If one policymaker follows a non-reactive rule, then policy is — by definition — perfectly coordinated. One way to think about non-reactive rules is as a way to give up some freedom of action (the loss of one or more stabilization policy instruments) in return for greater policy coordination. If the non-coordination problem is big enough, it may actually make sense to do this. To extend a well-worn metaphor, if one of your hands will simply fight with the other, it really may be better to tie one hand behind your back.

## **V. Some Examples of Monetary-Fiscal Rules**

Let us consider some specific rules that have actually been suggested for monetary and/or fiscal policy. Are these rules likely to increase or decrease policy coordination? Are they likely to improve the fiscal-monetary mix? How are they likely to function in the short run, when the emphasis is on stabilization, versus in the long run, when the emphasis is on growth?

### ***A. Hard-Core Monetarism***

The most famous and most widely-discussed suggestion for fiscal and monetary rules can be attributed, more or less accurately, to Milton Friedman. Under Friedman's suggested regime, which I will call "hard-core monetarism," the Fed would keep the money supply growing at some constant rate and the government would fix its spending and tax-transfer schedules according to allocative considerations. Both would refuse to deviate from these rules for cyclical reasons. Notice that under this regime both policymakers would be following non-reactive rules.

One new element has entered the debate in recent years. Some years ago, Solow and I (1973) showed that a policy of holding the money supply constant and financing all deficits by issuing bonds could destabilize the economy, whereas financing deficits by money creation probably led to a stable system. This finding, while derived in a very simple and special case with fixed prices, has proven to be remarkably robust. Tobin and Buitert (1976) established a parallel result for a full-employment economy with perfectly flexible prices. Pyle and

Turnovsky (1976) and others showed that analogous results obtain in models intermediate between these two extremes, such as models with an expectations-augmented Phillips curve.

Recently, McCallum (1981, 1982), Smith (1982) and Sargent and Wallace (1981) have re-emphasized the importance of this result for the hard-core monetarist policy rule. Though using rather different models, each has made the same point: that the system is liable to be dynamically unstable under a policy that holds both fiscal policy (defined in various ways by the different authors) and the money supply (or its growth rate) constant.

The mechanism behind these results is not hard to understand. Suppose some shock (such as an autonomous decline in demand in a Keynesian model) opens up a deficit in the government budget, and the hard-core monetarist regime is in force. Bonds will be issued to finance the deficit. With both interest rates and the number of bonds increasing, interest payments on the national debt will be increasing. But this increases the deficit still further, requiring even larger issues of bonds in subsequent periods, and the process repeats. If the real rate of interest exceeds the rate of population growth, then the real supply of bonds per capita will grow without limit. Consequently, unless bonds are totally irrelevant to other economic variables, as in the non-Ricardian view of Barro, (1974), the whole economy will explode.<sup>18</sup>

So the stabilizing properties of the hard-core monetarist rule are open to serious question, to say the least. What about its longer-run effects?

As a long-run defense against inflation, the monetarist rule seems to be very effective. Although academic scribblers can, and have, constructed examples of continuous inflation without money growth, my feeling is that policymakers can justifiably treat these models as intellectual curiosa and proceed on the assumption that a maintained money growth rate will eventually control the rate of inflation.

But what about capital formation and real economic growth? When a recession comes, the hard-core monetarist rule takes no remedial action. If there is an important accelerator aspect to investment spending, the slack demand will retard capital formation. At the same time,

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18. In a complex system, many more things are going on than I can describe in a single paragraph. For example, income and prices are changing, with important consequences for the budget deficit. Yet the basic mechanism described here seems to come shining through in all the models.

the issuance of new government bonds to finance the budget deficits that recession brings will push up interest rates. And this, too, will retard investment spending. The likely result is that hard-core monetarism will not create a climate conducive to investment unless long-run predictability of the price level is a more important determinant of investment than I think it is.<sup>19</sup>

It seems to me that much of the concern over fiscal-monetary coordination derives from concern over the implications of the policy mix for investment. If so, then hard-core monetarism, which eliminates the coordination issue by eliminating policy, does not look to be a very good solution.

### ***B. Bondism***

As McCallum (1981) first pointed out, a potentially better monetary-fiscal rule was actually suggested by Friedman in his earlier "A Monetary and Fiscal Framework for Economic Stability" (1948), but subsequently abandoned. For lack of a better name, Gary Smith (1982) has suggested that we call the policy "bondism" because it treats bonds in much the same way as monetarism treats money.

Under the old Friedman policy, both fiscal and monetary policy would be governed by rules, but the monetary rule would be reactive. In particular, Friedman suggested that government spending and tax rates be set in accordance with allocative considerations, as in the monetarist rule, but that all deficits be financed by money creation. Both McCallum (1981, 1982) and Smith (1982) observed that this policy regime is equivalent to the "money financing" scenario in Blinder and Solow (1973), and hence probably leads to a stable system. On this score alone, it has much to recommend it over monetarism.

But there is more to the story. Consider what would happen when, for example, a deficiency of aggregate demand brought on a recession. Falling incomes would open up a budget deficit, and this would automatically induce the Fed to open the monetary spigots. The economy would get a strong anti-recessionary stimulus from monetary policy. And I do mean strong. Think about the empirical magnitudes involved. In the current U.S. economy, a 1 percentage point rise in the

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19. Or unless inflation itself is damaging to investment via, for example, the deterioration of the real value of depreciation allowances. This last factor has been stressed in a number of places by Feldstein. See, among others, Feldstein (1980b).

unemployment rate adds about \$25 billion to the budget deficit. But the "money" that would be issued to finance the deficit would be high-powered money. Adding \$25 billion in new bank reserves is a colossal injection of money; it would increase total bank reserves by nearly 50 percent! Thus the old Friedman rule would seem to be an incredibly powerful stabilizer.<sup>20</sup>

How does it score on the more long-run criteria? The fact that recessions would automatically engender easy money under the "bondist" policy augurs well for capital formation. So does the notion that cyclical disturbances would probably be quite muted. The one potential worry is over inflation. The rule can conceivably lead to a lot of money creation in a hurry, with subsequent inflationary consequences. But if the fiscal part of the rule keeps the high-employment budget balanced, and if the economy fluctuates around its high-employment norm, this should not be a major worry. Monetary expansions should subsequently be reversed by monetary contractions.<sup>21</sup> If the rule is believed, even large injections of money should not raise the spectre of secular inflation.

Finally, note that the old Friedman rule completely eliminates the possibility that monetary and fiscal policy might act at cross purposes. Under the rule, monetary policy is expansionary if and only if fiscal policy (defined by the automatic stabilizers) is expansionary. Also, the game-theoretic considerations raised in Section III cannot arise because neither policymaker has any decision to make.

While I have never been an advocate of rules, it seems to me that all this adds up to a clear conclusion: the old Friedman rule ought to get serious quantitative attention.

### *C. Sop-Core Monetarism*

The rule just discussed would make fiscal policy nonreactive and monetary policy reactive. A symmetric approach would call for a rule in which monetary policy is nonreactive but fiscal policy reacts in a

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20. Maybe too powerful. This exercise in casual empiricism, in conjunction with the fact that the effects of high-powered money on income come with a distributed lag, raises worries that the rule might actually destabilize the economy by over-reacting to disturbances. The theoretical papers mentioned earlier deny this possibility, but they ignore distributed lags. The issue seems worth investigating.

21. This statement is predicated on defining high employment as approximately the natural rate. With a Humphrey-Hawkins type definition of high employment, the old Friedman rule can lead to inflationary disaster.

countercyclical fashion. John Taylor (1982a) has mentioned just such a possibility as a way to put a meaningful countercyclical policy regime in place without creating expectations that inflationary shocks will be accommodated. Under this regime, monetary policy would adhere to a k-percent rule but fiscal policy would be used for countercyclical purposes. The latter could be done either by rules or by discretion.

What can we say about this policy regime? Not much, of course, until it has been given more theoretical and empirical scrutiny. But a few observations can be made.

First, the coordination problem is definitionally solved. With no monetary policy, it can hardly be in opposition to fiscal policy. Second, the game-theoretic aspects of stabilization policy would necessarily disappear. The government could hardly try to "game" a k-percent rule.

Would cyclical stabilization be strong enough? That cannot be answered in the abstract, since Taylor's policy mix does not specify the strength of the fiscal stabilizers. But it does not seem likely that they would be as strong as the stabilizing forces in Friedman's "bondist" rule.

Finally, there is the long-run capital formation issue. Reducing the severity of recessions, I believe, can only do good things for investment. But doing so with fiscal policy probably means that interest rates would be pushed up by the countercyclical policy.<sup>22</sup> So there could conceivably be a tradeoff between short-run stabilization and long-run growth.

## Appendix

This appendix considers a monetary-fiscal policy game in which each authority has three strategies: to expand aggregate demand, to contract aggregate demand, or to do nothing. The outcomes are ranked from 1 to 9 in the payoff matrix in Figure 6, with the rankings of the fiscal authority again below the diagonal and the monetary rankings above.

Circles indicate the best fiscal response to each monetary strategy and squares indicate the best monetary response to each fiscal strategy.

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22. This could be avoided if expansionary fiscal changes took the form, say, of liberalizing depreciation allowances or raising the investment tax credit. But the personal income tax and certain government expenditures appear to be the prime candidates to bear the stabilization burden.

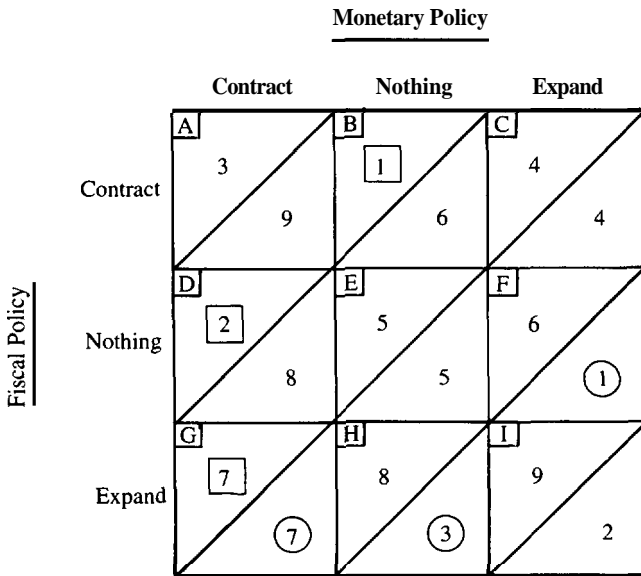


FIGURE 6

It is clear that box G, in the lower **lefthand** corner, is the only Nash equilibrium. As in the 2 by 2 example in the text, monetary policy is contractionary and fiscal policy is expansionary. We can also see that the Nash equilibrium is Pareto dominated by a variety of other outcomes: boxes B, E, C, and F.

If the Fed is the leader and the government is the follower, the solution is box F; this is the best the Fed can do if constrained to the fiscal reaction function (the boxes with circles). By similar reasoning, we see that box B will arise if the government leads and the Fed follows. In this example, either leader-follower equilibrium is superior to the Nash equilibrium (though the leader has more to gain).

Another possible outcome of complete lack of coordination is that each authority ignores the other and shoots for its global optimum. In the example, that would mean that each does nothing and box E results. This outcome Pareto dominates the Nash equilibrium, but is in turn Pareto dominated by box C (in which fiscal policy is contractionary while monetary policy is expansionary).

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