

Macroeconomic Policy and Domestic Saving

Rudolph G. Penner*

I. Introduction

Without a radical change in monetary and fiscal policy, the United States will experience a higher ratio of deficits to GNP in the 1980s than it has in any decade since the 1940s. It is crucial to understand the risk that this poses to future economic growth, but as the following review of the literature indicates, economic research on the issue is in a primitive state. Precise answers are far beyond our grasp, and all that we can do is describe the risks inherent in a very uncertain situation.

Although this is supposed to be a paper about macroeconomic policy and savings, it is impossible to explore the relevant issues without making frequent excursions into microeconomic theory. Consequently, this paper is bound to overlap with others delivered at this conference.

II. Relevant Micro Issues

Discussions of individual savings behavior are dominated by the life cycle hypothesis put forward by Modigliani and Brumberg [1954]. The individual is assumed to maximize the discounted utility provided by consumption over a lifetime subject to a lifetime wealth and income constraint. As a result, the time path of consumption is much smoother than the time path of disposable income over a lifetime. A typical individual might be expected to borrow in early years when income is low, save during the years of peak career earnings, and then dissave during the years of retirement. If the time of death is known with certainty and there is no bequest motive, the individual should spend his or her last penny on the day of death.

The theory can be modified to allow for uncertain lifetimes and income flows and for a bequest motive.

The life cycle hypothesis is ambiguous about whether increases in the after-tax rate of return raise or lower the propensity to consume in any one year. A higher rate of return has an income effect and allows higher consumption in all years even if saving is lowered a bit. However, it also makes the tradeoff between present and future consumption more favorable to the latter. Even if the income effect is neutralized, for example, by replacing a tax on capital income with a tax on wages, the relationship between the propensity to consume and the after-tax rate of return could be positive with a low enough elasticity of substitution between present and future consumption. However, Summers [1982] argues persuasively that this would require an odd utility function. Summers also shows that long-run

*Director of Tax Policy Studies and a resident scholar at the American Enterprise Institute.

changes in after-tax rates of return have a much more powerful impact on the consumption-savings decision than transitory changes.

With regard to the impact of uncompensated changes in the after-tax rates of return, the empirical evidence is all over the map. Boskin [1978] and Summers [1982] argue that increases in the rate of return raise the propensity to save (Summers argues on the basis of indirect data); Howrey and Hymans estimate [1978] that the impact is insignificant; and Houthakker and Taylor [1970] that there is a negative impact. (For a more complete review of the literature, see OECD [1981].) Summers iconoclastically suggests that most empirical work is dubious anyway because it does not correctly specify the effects of changes in the rate of return on human wealth.

The life cycle hypothesis can itself be questioned. The inability to lend and borrow at will on perfect capital markets adds another constraint on individuals' ability to smooth out lifetime consumption. For example, it may not be possible to borrow against human capital and this would limit the ability to be a dissaver early in life. Similarly, financial regulation, by imposing interest ceilings on small savers, could alter the reward to savings at different times in the life cycle.

The presence or absence of liquidity constraints is crucial to the impact of macroeconomic tax policy on consumption and, therefore, on aggregate demand. If liquidity considerations are constraining the consumption of a significant portion of the population, a tax cut can increase consumption (although other factors to be discussed later may intervene) even if the tax cut is only temporary or involves a rebate of past taxes. If there are no liquidity constraints, a tax cut can only be effective to the degree that it affects perceptions of lifetime income.

Again, it is possible to find evidence on all sides of the issue. Casual observation suggests that consumption and income vary more closely together over a lifetime than would be expected if there were no liquidity constraints.

But this result could also emerge in the absence of liquidity constraints. Money income is endogenous and can be controlled by varying work effort. If goods and leisure are substitutes, more goods will be consumed as wage rates rise along a typical career path. Empirical work by Schmitz [1979], however, suggests that goods and leisure are complements, leaving, in his view, only liquidity constraints to explain the phenomenon. Summers [1982], on the other hand, finds no evidence of liquidity constraints. (See Schmitz for a more complete review of the literature on this issue.)

The most disturbing evidence regarding the validity of the life cycle hypothesis comes from the fact that the elderly, who are supposed to be dissaving, do in fact have a positive propensity to save which rises with age. (Danziger, van der Gaag, Smolensky, and Taussig [1982].) Like most unpleasant facts, this one can be explained away. Perhaps, the bequest motive grows with age. Or the saving may be precautionary. The probability of serious, expensive illnesses rises with age as does the probability of a longer life requiring increased resources. For example, surviving from age 60 to age 61 increases the probability of living beyond any future specific age,

say 75, by about 1.5 percent. Surviving from age 61 to age 62 raises the probability by 1.7 percent and so on. The prospect of becoming destitute must have a very high negative utility weight attached to it. While SSI puts a floor under the real income of the elderly, the typical elderly person has an intense fear of becoming dependent on relatives or on welfare. For this reason, the work of Kotlikoff and Spivak [1981], which shows that the elderly can protect themselves against the uncertainty of the time of death by arranging the equivalent of an annuity within the family, may be made less relevant by an aversion to dependency.

Despite such factors, the surprisingly high propensity to save among the elderly has to be somewhat disturbing to life cycle advocates. I believe the whole issue of uncertainty and the life cycle hypothesis merits more theoretical and empirical work. The uncertainty of the time of death and the change in the probability distribution with each additional day of life must be important, but how important is difficult to say.

Assuming that the life cycle hypothesis is, in fact, valid, it is important to know whether it applies only to saving from income received directly by the individual or whether the individual adjusts for corporate and government saving or dissaving done on his or her behalf. Put another way, are there veils between individual behavior and corporate and government behavior or can we aggregate over all sectors of the economy? If there are not veils, a good theory of individual behavior combined with the effect of demographic variables and a theory of economic growth will tell us most of what we want to know about the long-run time path of aggregate savings. If, however, the savings of the individual sectors are determined independently, we then need separate theories of corporate and government saving behavior.

The notion that individual shareholders adjust their own behavior for changes in the saving and financial practices of corporations is commonly accepted in economic theory. It lies at the basis of the theories of Modigliani and Miller [1958] and is assumed in studies of saving behavior by scholars such as Boskin [1978]. However, a paradox arises. If a dollar of saving by a corporation is a perfect substitute for a dollar of saving by an individual, why do corporations ever pay dividends since they are taxed more heavily than capital gains? Or at least why do we not see more specialization by shareholders according to their tax status? Tax-free institutions might be expected to invest in firms with high payout ratios while high marginal tax rate shareholders would be expected to like firms that reinvested all of their profits. Theorizing on this topic was initiated by King [1977] and a literature too voluminous to review here has been inspired by the puzzle. I think it fair to say that no one has yet come up with a definitive explanation of dividend behavior and without it, one feels uneasy about assuming that shareholders are indifferent between saving directly and having corporations save on their behalf.

But while it may be too facile to assume that corporate and individual savings are perfect substitutes, it is hard to believe that they are not substitutes to some degree. Certainly individuals must pay some attention to changing share values—which are, of course affected by factors other than

current corporate saving—in planning their own savings behavior. A key policy question is whether taxes levied directly on the corporations have a significantly different aggregate saving impact than taxes levied directly on the individual even though they are designed to have the same impact on after-tax rates of return to capital. I do not believe that we know for sure.

It is, of course, possible that the answer differs depending on the time period being considered. Because of transactions costs or other factors, it may take time for individuals to adjust their saving behavior to changes undertaken at the corporate level. Thus policies affecting corporate saving directly may have some leverage in the short run but be washed out in the longer run as individuals adjust.

The veil between government and individual saving behavior is likely to be more opaque than the veil between individuals and corporations. Still, Barro [1974] has argued that individuals adapt their own saving to adjust for changes in government deficits. In other words, they perceive that public debt issues will either have to be repaid out of future taxes or the interest bill has to be financed forever. If the individual has an infinite time horizon because of an extreme bequest motive and if he or she faces the same rate of interest as the government, the time of the repayment of the debt is irrelevant. Borrowing by the government will be offset by an equal amount of saving by the individual. Neither is likely to hold exactly, but to the degree that these conditions are valid, the government becomes powerless to affect national saving and, therefore, to carry out fiscal stabilization policies. In other words, it matters little whether government finances outlays with taxes or debt issues, i.e., they are equivalent.

The Barro equivalence theorem (sometimes blamed on Ricardo) has been much criticized, (see Feldstein [1982]) but it cannot be said that it has been disproved beyond any doubt. After considering evidence that seems inconsistent with the theory, Buiter and Tobin [1979] conclude that "Further empirical work is urgently needed, however, before any conclusion can be more than tentative."

Many discussions of the equivalence theorem, including Buiter and Tobin's, ignore the spending side of the government budget. The level and composition of government spending are taken as given and the only question is whether tax and debt financing are equivalent. If the world is as ultrarational as Barro's theory implies, and if the government increases the deficit explicitly to finance increased public capital formation, and if the return to the public capital is equal to that on private capital, there is no reason for private consumption to fall or rise except as a result of the distributional effects of the operation. Private capital formation is crowded out dollar for dollar, but that is not worrisome as long as public capital formation bears an equal return.

Whether or not the equivalence theorem is valid is crucial to many fundamental issues in economics. If it is valid, we have totally to reject fiscal stabilization theory. In neoclassical theory, we need not worry about crowding out, and since private saving actions offset public actions across the generations, we can dispense with the worry that a pay-as-you-go social security system depresses aggregate savings.

Although the theory cannot be definitively proved or disproved on the basis of the evidence currently available, it must be noted that it places extraordinary demands on the individual. The taxpayer must be completely altruistic toward future generations and must use the same discount rate to value their consumption as is used for his or her own consumption. Moreover, taxpayers must be extremely knowledgeable about the saving behavior of the federal, state, and local governments. Further, they must face a borrowing rate no higher than the government's in order not to be pleased to some degree that the government borrows on their behalf.

Economic theories often make unrealistic assumptions, but while economists do not really believe them it is hoped that the departures from the assumptions are unbiased in their impact on the results. In the case of the assumptions underlying the equivalence theorem, I would suggest that most of the departures are likely to be in one direction. That is to say, I doubt that for everyone who does not care much about the consumption of future generations there is someone else who gives it more of a utility weight than consumption by the present generation. Similarly, there are unlikely to be enough investors facing a lower borrowing rate than the government to offset those who face a higher rate. Perhaps, there is more symmetry in the errors made regarding the individual's perception of his or her share of the public debt service burden, but I see no reason to believe that that burden should be overestimated on average.

Consequently, I believe that there are significant biases in the assumptions necessary to derive the equivalence theorem and that those biases are bound to weaken the theorem. This implies that government can have some leverage over aggregate saving by manipulating the deficit and altering the social security system. How much leverage is hard to determine. But some leverage seems almost certain and I shall speculate on the issue further in what follows.

III. Macroeconomic Policies

A. Political and Normative Theories of Government Saving

There are two very different ways of discussing macroeconomic policies. One can idealistically assume that macro policymakers share the goals of the public (as represented in public choice theory by the goals of the median voter) and attempt to attain price stability along a path that deviates as little as possible from that which attains whatever natural rate of unemployment is implied by demography, institutional arrangements, and microeconomic policies. Alternatively, one can be more cynical and assume that policymakers and bureaucrats are out to maximize their own personal objective functions which might involve things like maximizing power, political longevity, and/or future income in the private sector. Differences between the policymakers' and median voters' objective function can evolve because of imperfections in information flows and voting mechanisms.

For most of this analysis, I shall take the idealistic view, but one theory regarding macro policy and long-run saving requires a momentary exploration of the cynical view of policymaking.

Milton Friedman and others have argued that aggregate government spending is limited by available receipts. In other words, politicians think like householders and there is a limit on the dissaving that will be done by government. Put another way, if we can somehow trick politicians into cutting taxes, it will constrain spending in the long run.

The theory is probably true at the state and local level, but a superficial look at federal behavior is not reassuring. During the decade of the 1950s, the NIA budget was balanced on average. Government expenditures averaged 18.4 percent of the GNP. In the 1960s, the deficit equalled 0.3 and spending 19.4 percent of the GNP. In the 1970s the comparable figures were 1.8 and 21.3 percent. In 1980–81 the deficit amounted to 2.2 percent of the GNP and spending 23.2 percent.

If deficits act as a constraint on spending growth, that constraint seems to be getting weaker and weaker over time. Wagner and Buchanan [1977] explain the phenomenon by arguing that the Keynesian revolution destroyed the traditional fiscal norm that budgets should be balanced. Once the old norm was destroyed, no other disciplining rule took its place. While some argued that the budget should be balanced over the cycle and Richard Nixon argued that the high employment budget should be balanced, none of these new rules had the force of the old fashioned religion of budget balancing year after year.

Wagner and Buchanan go even further, arguing that once deficits become acceptable, spending growth is facilitated further by the fact that the sale of debt represents a voluntary exchange and is therefore less unpleasant than financing government by levying compulsory taxes.

Although the Wagner-Buchanan hypothesis would seem at first sight to be a better explanation of recent history than the notion that deficits impose spending constraint, it is obvious that deficits cannot rise without limit. Sargent and Wallace [1981] have shown that if noninterest spending is a greater share of GNP than the total tax burden and if nominal interest rates exceed nominal GNP growth, the system is unstable because the interest bill on the debt eventually explodes. They hypothesize that the debt will eventually be monetized under such circumstances. Accelerating inflation will then diminish the real interest burden on past issues of debt. It is to be hoped that either spending or tax policy would be altered before that occurred, and indeed, that could occur automatically.

Monetary and fiscal policy are intimately intertwined. As debt is monetized, the tax burden rises more rapidly than GNP because of bracket creep in a nonindexed income tax system and because the measure of capital income used for tax purposes is increased as the real value of depreciation allowances erode, false inventory profits are created, etc. The indexing of exemptions and tax brackets now scheduled to be implemented in 1985 eliminates bracket creep but does nothing to adjust the definition of capital income. It is also somewhat imperfect in that many dollar amounts

listed in the tax code are not indexed, e.g., those involving exemptions on homeowner capital gains and unemployment insurance. Consequently, even after indexing, inflation will raise average tax rates, but to a much lesser extent than it does today.

On the outlay side, accelerating inflation slows the growth of real spending because of time lags in the indexation of entitlement programs. In practice, there are also time lags in adjusting appropriations for unanticipated inflation. Frequently, such appropriations are not adjusted at all, since politicians often find it easier to let inflation cut programs than to cut them legislatively.

Because of such automatic adjustments in tax and spending policy, the probability of a Sargent-Wallace debt explosion is lessened, but it cannot be ruled out altogether. During the 1950s and 1960s, on- plus off-budget deficits seldom exceeded the net interest bill of the government and under such circumstances a Sargent-Wallace explosion becomes less likely. In fact, the ratio of privately held debt to GNP was on a strong downward trend from World War II to 1974. In six of the seven years in the 1975-81 period, however, the total deficit far exceeded the net interest bill and recently, interest rates have exceeded the growth of GNP. As a result, the ratio of privately held debt to GNP is back up to the level of the early 70s and growing rapidly. One hopes that Milton Friedman's spending constraint will not be overwhelmed by Sargent and Wallace's arithmetic, but there is nothing very reassuring in the recent evidence.

Robert Barro [1979] has provided a normative theory of government deficits or dissaving based on the assumption that there are welfare gains associated with keeping tax rates as constant as possible. In his model, temporary surges in spending, e.g., those associated with wars, are debt financed as are temporary shortfalls in revenue. The government also runs deficits to compensate for the erosion of outstanding debt by inflation.

Cagan [1981] has investigated the last issue and differentiates the effects of anticipated and unanticipated inflation. Presumably, all other things equal, investors are willing buyers of enough bonds to maintain the real value of their portfolios in the presence of anticipated inflation, but the issue is not so clear with regard to unanticipated inflation. Having dissaved by surprise, will investors be willing to buy enough bonds to restore their wealth? It seems unlikely given that they have just suffered an unexpected capital loss. If investors do not wish to restore their assets, there will not automatically be a flow of saving sufficient to absorb the new debt issued by the Treasury in the name of keeping the real value of the national debt constant. Of course, once that is said it means that we are departing from Barro's world of equivalence which necessarily underlies his theory of optimal deficits. And once the equivalence assumption is dropped, it is not even clear that government would want to replace the debt eroded by anticipated inflation.

Without equivalence, the government can manipulate national saving in an attempt to achieve short-term stabilization goals or long-run growth goals. In doing this it should, of course, take account of the erosion of out-

standing debt in designing its policies, but many other variables are also important and there is no presumption that deficits are appropriate so long as they do not exceed the erosion of outstanding debt or inappropriate if they do.

B. Stabilization Policy

Can fiscal and monetary policy manipulate aggregate demand and real economic activity, and so alter saving? It is not a question that would have been asked much 20 years ago except by a few isolated monetarists. Now it is a matter of considerable controversy.

The power of fiscal policy is, of course, quite limited in monetarist theory. Monetarists believe that the demand for money is fairly stable and inelastic with respect to changes in interest rates. In such circumstances any attempt to stimulate aggregate demand by raising the deficit simply results in an equal crowding out of private activity. That is somewhat of a caricature of the monetarist position since most think that fiscal policy can have some small, ephemeral effect on economic activity. However, I know of none who believe that fiscal fine tuning could lead us to growth consistent with full employment, price stability, and an appropriate amount of aggregate saving.

They also would eschew fine tuning with monetary policy even though, in monetarist and in most Keynesian theory, monetary policy can affect real activity with an uncertain lag. Pure rational expectations theory even rejects this proposition. (See Sargent and Wallace [1975] for the classic article.) Monetary expansion leads people to expect inflation which, in turn, leads them to adjust wages and prices immediately. Monetary policy affects price levels but not real activity. Again this is a caricature. Monetary policy can affect real activity if it catches people by surprise or if price and wage movements are restricted by long-term contracts. But the important conclusion is that monetary and fiscal policy may be much less potent than earlier stabilization theory implied.

It is not, however, necessary to be a monetarist or a believer in the equivalence theorem or rational expectations to question the power of fiscal policy. Even within traditional Keynesian analysis there is reason to ask whether macro fiscal policy has much leverage over the position of the IS curve.

The earlier discussion of the life cycle hypothesis suggests that, in the absence of liquidity constraints, fiscal policy will have to alter expectations of permanent income in order to affect aggregate consumption. In other words, private saving could offset public dissaving for reasons quite different from those relevant to the equivalence theorem. If changes in government spending or tax policy are deemed to be temporary, the Keynesian multiplier could quickly be short-circuited by changes in the propensity to save.

After the experience of the 1970s and early 1980s, it will be particularly difficult for the government to convince anyone that any tax change

is permanent. A whole succession of so-called tax cuts in the 1970s was quickly offset by bracket creep, and the massive tax act of 1981 is so large that no one can be confident that it will not be reversed by new legislation.

It has gone out of style to contemplate using government spending for stabilization purposes, but even if it were popular, it would face the same problems as tax policy in altering expectations of permanent income. Government purchases related to things like accelerated public works programs are explicitly temporary. Changes in government transfers face problems precisely analogous to those faced by tax changes, and changes in grants-in-aid can be short-circuited long before the consumer is affected if, as was often charged with regard to President Carter's 1977 stimulus program, they simply reduce state and local deficits at the expense of the federal deficit.

In all of these matters the question of liquidity constraints becomes crucial. If they are important, either to individuals or to state and local governments, federal spending changes or tax cuts are more likely to have an impact. Even tax rebates or explicitly temporary changes in tax or spending policy could conceivably work. As usual, the empirical evidence on the issue is not conclusive. A particularly interesting debate regarding the impact of the temporary Vietnam surtax occurs between Springer [1975] and Okun [1977].

C. Long-Run Growth

Even if it is assumed that government can alter the aggregate saving rate in the economy, it is not clear whether it should attempt to do so in the long run. There is a long debate regarding the appropriateness of the rate of time preference revealed by the market place. Does it undervalue the welfare of future generations? If so, should government intervene and provide additional saving by running a surplus? Should government use different criteria in evaluating its own investments from those revealed by the market place, especially with regard to the rate of discount and the required risk premium?

The literature on such issues is voluminous, but I shall not attempt a review here. The issues may be important but they are unlikely to be at the heart of policy discussions over the next decade. There is little danger of running surpluses in any of the Western democracies. (See de Larosiere [1982].) All are contending with rapidly growing entitlement programs and a public reluctant to either cut benefits or raise taxes. Deficits are the order of the day and everyone is trying to borrow from everyone else. The United States has the added problem of a generally perceived need to reduce the taxation of capital and to increase defense spending rapidly.

Given large deficits, it is still possible to alter the composition of tax receipts and spending in ways that are more or less conducive to saving, investment, and growth, but I shall leave most of those issues to those writing on micro policy. There is, however, one compositional issue that may be considered macro in content. A naive glance at the saving behavior of dif-

ferent income classes leads some to believe that aggregate saving can be enhanced by making the tax-transfer structure less progressive. However, average saving propensities differ much more across income classes than marginal saving propensities and it is the latter which determine the net income effect on savings of redistributing income. Thus the scope for increasing aggregate saving through redistribution is severely limited. (See Blinder [1975].) However, since small percentage reductions in very high marginal income tax rates result in large percentage increases in the after-tax reward to saving, efforts to improve incentives may have income redistribution effects as a by-product of attempts to exploit substitution effects. Disincentives can be reduced and efficiency enhanced while maintaining tax revenues either by making the marginal rate structure less progressive or by broadening the tax base so that all marginal tax rates can be lowered. The distributional effects of the two strategies are likely to differ radically, but it is necessary to know the details of such strategies in order to make the crudest forecasts of their implications.

D. Recent U.S. Macro Policies

The Reagan administration entered office with a clearly defined set of priorities. It wanted to raise defense spending and business capital formation and to reduce inflation, marginal tax rates, nondefense public spending, and the government deficit. These objectives are not logically inconsistent. The trouble is that the administration got its numbers wrong. Given its tax and spending plans the projected deficit path was inconsistent with the enunciated, anti-inflation, monetary policy. It depended on a higher growth path for nominal incomes than could possibly be financed by the targets stipulated for the growth of the monetary aggregates.

But if a lower deficit was deleted from the list of goals, the policy was not obviously irrational. It was possible to create reasonable scenarios in which the deficit did not exceed $2\frac{1}{2}$ percent of GNP. If one did not believe in the equivalence theorem, it could be considered a high real interest rate strategy, but one that still encouraged business capital formation by providing tax cuts on capital income which more than offset the high interest rates. Consumer durables and housing which were not protected by tax benefits would lose resources to business capital formation and defense spending. The interest rate increase would be mitigated by the increased saving resulting from generally lower marginal tax rates and special incentives for savings. With a bit of luck we could also borrow significant amounts from abroad.

Needless to say, things did not work out that neatly. The administration got an abrupt monetary shock instead of the gradualism that it wanted. The serious recession raised the deficit and the mysterious failure of interest rates to come down in response to economic weakness and falling inflation meant that the government interest bill soared and offset a high proportion of the administration's domestic spending cuts, which, in turn, were about \$10 billion less than Reagan requested. While spending went on a higher path than expected, the rapid fall in inflation implied less

bracket creep and lower capital taxes than expected and the administration's tax cuts became real tax cuts to a much greater degree than anticipated.

As a result of all of this, we appeared to be on a path toward deficits equivalent to over 6 percent of the GNP by 1985, even if a healthy economic recovery was assumed.

The administration responded by backing a tax bill which took back a portion of the tax reductions of 1981. To a large degree the correction was applied to the taxation of capital income. Crudely speaking, one can argue that the administration and Congress simply corrected for the fact that a surprising fall in inflation made 1981 tax legislation much more generous toward capital income than they intended it to be.

However, the tax actions and budget cuts of 1982 resolve only a part of the long-term deficit problem. Even assuming a fairly healthy recovery we are on the road toward deficits approaching levels relative to GNP generally experienced in the past only during recessions. The question now is, "What should we do about it?"

The answer depends crucially on the effects of taxes, spending, and deficits on aggregate saving, and the foregoing review of the literature generated more uncertainty than hard information regarding such issues. Indeed, a skeptic might argue that we know so little that this paper might as well end at this point. I believe, however, that such a conclusion would represent a serious misreading of what went on before. We are faced with a problem of decisionmaking under great uncertainty. The risks must be outlined and we must ask how they can be minimized. Knowing what we do not know will be helpful in this process.

In contending with the structural deficit problem it is first important to examine the spending side of the budget. There the options are fairly limited. In the second half of the 1980s, defense, social security (OASDI) and interest will absorb over 70 percent of the total budget. While areas in the remaining 30 percent of the budget could stand careful scrutiny, for example, health services delivery systems, it is obvious that changes in defense and social security policy are essential if spending cuts are to contribute significantly to ameliorating the deficit problem. In both of those areas it is extremely difficult to make rapid changes in the outlay path. I believe it fair to say that the consensus among defense experts is that it would be dangerous to make immediate significant cuts in personnel, operations, training, and maintenance. The state of readiness of our forces could be compromised by such cuts. There is much less of a consensus about the value of expensive weapons systems such as the B-1 bomber, nuclear carriers, MX missiles, etc. But cuts in the budget authority for such programs do not show up in outlays for years. It is already too late in 1982 to achieve major savings in such areas before 1985.

It is equally difficult to constrain social security spending in the short run. Even advocates of reducing social security benefits must admit that a social contract exists between recipients and taxpayers and that recipients and those about to retire must be given time to plan their responses to any

changes in the benefit structure. In other words, changes have to be phased in very slowly. Thus it would be unrealistic to assume that much can be saved by the middle 1980s by reducing social security benefits. That does not, however, mean that all changes should be rejected. There is a potential for massive savings by the early 21st century with only minor reductions in the rate of growth of the program.

Thus, if we are to reduce federal government dissaving significantly in the 1984–87 period, the emphasis will have to be on raising taxes.

What are the risks associated with tax increases? Let us first examine the question in a neoclassical context. Does any risk stem from the possibility that the equivalence theorem is true? I do not believe so. If taxes and borrowing are really equivalent, little loss could be associated with replacing one for another. As previously noted, Barro has developed a model based on the equivalence theorem that yields an optimum deficit, but the welfare losses involved in departing from this optimum on the low side must be tiny compared to the risks that a very large deficit poses for capital formation if there is little truth to the equivalence theorem. Moreover, it is hard to believe that Barro's optimum deficit would grow in the middle 1980s. There is no reason to believe that the spending levels that will prevail during that period are temporary. Moreover, if disinflation continues, the debt issues implied by current policy will far exceed the inflation-induced fall in the real value of the outstanding national debt.

What can be said about the supply-siders' fear that a tax increase, by raising disincentives to work and to save, would reduce economic activity and the propensity to save so much that private saving would be reduced by more than the public deficit is reduced? (If, indeed, the deficit would be reduced at all.) While our review of the economic literature revealed a profound lack of knowledge regarding the response of saving to a change in after-tax return, even the highest response found in the literature would not seem to substantiate the supply-siders' fears. (See Fullerton [1980].)

But it is not necessary to swallow extreme supply-side theory to believe that tax increases should be designed to minimize supply-side effects. That goal can be achieved by what might be called supply-side tax increases. These would concentrate on base-broadening measures rather than on increasing marginal tax rates. It is to be hoped that if it does nothing else, the recent debate regarding the desirability of a flat tax will push tax increases in this direction. Although base-broadening measures could reduce the incentive for particular types of saving and capital formation, their generalized impact is likely to pose far lower risks to incentives than marginal rate increases.

It is when we leave the neoclassical world and enter the Keynesian world that the risks associated with tax increases become more perplexing. The main risk is that the recovery will be retarded more than is warranted by the desire to continue progress against inflation. The theoretical and empirical disputes between Keynesians and non-Keynesians are sufficiently profound and the correlated value judgments regarding the relative costs of unemployment and inflation are sufficiently different that it is impossible to

find a consensus within the economics profession regarding the importance of this risk.

However, there might—and I emphasize the word might—be general agreement regarding the following propositions:

1. By any estimate of the high employment deficit, current policy is expansionary over the whole period 1983–87 and this is inappropriate during a recovery.
2. A tax increase that has its largest revenue impact later in the 1983–87 period is less risky than one that has a relatively large impact initially.

Another proposition must be considered, although there is likely to be little agreement regarding its validity. That is that measures to reduce deficits in the 1984–87 period would actually have a stimulative impact in 1983 even within the context of a Keynesian model.

This proposition seems to stand Keynes on his head, but one could argue on its behalf as follows:

Potential investors believe that the prospective deficits of the middle 1980s are unlikely to be tolerated, but they do not know how the issues will be resolved. The options are legislated spending cuts, legislated tax increases, or the monetization of an inordinate proportion of the debt. Accelerating inflation would lead to large tax increases because of bracket creep before indexing in 1985 (if indexing survives that long) and the increased taxation of the real return to capital which is not prevented by the indexing techniques used in current law. It would also reduce the real value of outlays because current indexing techniques work with time lags and because there would also be lags in adjusting appropriations for nonindexed programs.

Different approaches to the deficit problem have very different implications for the after-tax rates of return on different investments. The resulting uncertainty causes investors to demand large risk premiums on long-term investments. By reducing uncertainty a tax increase that had its main revenue impact later in the 1984–87 period would reduce the demand for risk premiums on investments made in 1983. This would tend to shift the IS curve outward.

That may be a long story to swallow, but it does lead to the same policy conclusion as the discussion of the more typically Keynesian assessment of the threat posed by a tax increase to aggregate demand early in the recovery period. That is to say, any tax increase enacted early in the 1983–87 period should be designed to have its main revenue impact late in the period. In general terms, the tax legislation of 1982 satisfies this criterion.

If taxes are increased, should monetary policy be eased modestly to diminish the risk of declining real activity? Most Keynesians would advocate such a policy. As a by-product, an easier monetary policy would reduce the deficit by expanding money incomes and tax receipts, regardless of whether the expansion took the form of inflation or real growth. But obviously, the latter would be more beneficial in reducing the deficit, because income maintenance outlays would be lowered.

There is considerable dispute over how the expansion of money income created by a slightly easier monetary policy would divide up between real growth and inflation. Some, usually Keynesians, feel that at current levels of economic slack the inflation danger is minimal and that most of the monetary stimulus would show up as real growth. Others believe that investors would see a slight easing as a harbinger that the Fed was giving up its anti-inflation battle. Expectations of accelerating inflation would predominate and wages, prices, and interest rates would rise almost immediately. Investors perceiving greater economic instability in the future would become more conservative implying that the IS curve shifts to the left.

In other words, just as one can concoct stories in which a contractionary tax increase is expansionary, there are stories which make an expansionary monetary policy contractionary. It is a strange world in that such stories cannot be dismissed out of hand.

IV. Conclusions

Economists are ridiculed because of an apparent inability to reach a consensus on any policy issue. The foregoing review of the literature relevant to normative and positive theories regarding the relationship between macro policy and savings did little to dispel the notion that economists are terribly confused. There seems to be little consensus regarding either the effect of changing public deficits or the effect of changing after-tax rates of return on aggregate saving.

However, I would strongly argue that the uncertainty regarding outcomes should not prevent economists from making recommendations regarding policies. We do know enough to identify the risks and to reduce them to some degree.

When faced with burgeoning deficits, it seems clear that a tax increase which emphasizes base-broadening measures poses little risk to the supply side of the economy. Abstracting from the demand-side effects, we can say with considerable confidence that such a tax increase would, at worst, leave aggregate private plus public saving unchanged and at best result in a considerable increase in total saving.

When demand-side considerations are raised, the plot thickens. There is a risk that a tax increase would be contractionary in the short run. But that risk can be greatly reduced by designing the tax increase to have its greatest revenue impact in the second half of the 1980s. Hence, I believe that one could get the vast majority of economists to back a base-broadening tax increase of this type. There would be arguments over the size of the increase but political constraints on future tax increases are likely to become binding long before we reach the range over which economists disagree.

A more vehement argument would be unleashed when economists argue over whether the consensus tax increase would be accompanied by a looser monetary policy. There would even be some disagreement over the definition of a looser monetary policy. But there is considerable agreement regarding the range of possible outcomes even if there are profound

disagreements regarding the probability weight and the social utility weight that should be assigned to each of the possibilities. In such circumstances we have to let the politicians choose the appropriate weights after hearing and reading the profession's internal arguments. That is what we pay them for.

BIBLIOGRAPHY

- Barro, Robert J. "Are Government Bonds Net Wealth?", *Journal of Political Economy*, 82:1095-1117.
- "On the Determination of the Public Debt," *Journal of Political Economy*, 87:940-971.
- Blinder, Alan S. "Distribution Effects and the Aggregate Consumption Function," *Journal of Political Economy*, 83:447-475.
- Boskin, Michael J. "Taxation, Saving, and the Rate of Interest," *Journal of Political Economy*, 86:3-27.
- Buiter, Willem H., and James Tobin. "Debt Neutrality: A Brief Review of Doctrine and Evidence," in George M. von Furstenberg, ed., *Social Security versus Private Saving*. Cambridge, Ma.: Ballinger Publishing Co., 1979.
- Cagan, Phillip. "The Real Federal Deficit and Financial Markets," *The AEI Economist*, November 1981, pp. 1-6.
- Danziger, van der Gaag, Smolinsky and Taussig. "The Life-Cycle Hypothesis and the Consumption Behavior of the Elderly." Madison, Wis.: University of Wisconsin Institute for Research on Poverty. Discussion paper, May 1982.
- de Larosiere, Jacques. "Restoring Fiscal Discipline: A Vital Element of a Policy for Economic Recovery." Address to the American Enterprise Institute, Washington, D.C., March, 1982.
- Feldstein, Martin. "Government Deficits and Aggregate Demand," *Journal of Monetary Economics*, 9:1-20.
- Fullerton, Don. "On the Possibility of an Inverse Relationship Between Tax Rates and Government Revenues." National Bureau of Economic Research, Working Paper No. 467, April, 1980.
- Houthakker, H. S., and Lester Taylor. *Consumer Demand in the United States: Analyses and Projections*. Boston: Harvard University Press, 1970.
- Howrey, Philip E., and Saul H. Hymans. "The Measurement and Determination and Loanable-Funds Saving," *Brookings Papers on Economic Activity* 1978, No. 3, pp. 655-705.
- King, Marvin. *Public Policy and the Corporation*, New York: Halsted Press, 1977.
- Kotlikoff, Lawrence J., and Spivak. "The Family as an Incomplete Annuities Market," *Journal of Political Economy*, 89:372-391.
- Modigliani, Franco, and Richard Brumberg. "Utility Analysis and the Consumption Function. An Interpretation of Cross-Section Data," in Kenneth Kurihara, ed., *Post Keynesian Economics*. New Brunswick: Rutgers University Press, 1954.
- and Merton H. Miller. "The Cost of Capital, Corporation Finance, and the Theory of Investment," *American Economic Review*, 48:261-97.
- OECD. "International Difference and Trend Changes in Saving Ratios." (The Working Party No. 1 of the Economic Policy Committee; document CPE/WPI (81)9), Paris 1981.
- Okun, A. M. "The Personal Tax Surcharge and Consumer Demand, 1968-70," *Brookings Papers on Economic Activity* 1971, No. 1, pp. 167-212.
- Sargent, Thomas J., and Neil Wallace. "Some Unpleasant Monetarist Arithmetic," *Federal Reserve Bank of Minneapolis Quarterly Review*, Fall 1981, pp. 1-17.

- Schmitz, Robert J. "The Life Cycle of Saving and Consumption," in George M. von Furstenberg, ed. *Social Security versus Private Saving*. Cambridge, Ma.: Ballinger Publishing Co., 1979.
- Springer, W. L. "Did the 1968 Surcharge Really Work?", *American Economic Review* 65 (September 1975) pp. 644-58.
- Summers, Lawrence H. "The Interest Elasticity of Aggregate Saving: Theory and Evidence." Massachusetts Institute of Technology, 1982. (Mimeographed.)
- Wagner, Richard E., and James M. Buchanan. *Democracy in Deficit: The Political Legacy of Lord Keynes*. New York: Academic Press, 1977.

Discussion

James Tobin*

Rudy Penner is a sensible and cautious fellow. He did his homework on recent theoretical and econometric literature concerning national saving, seeking to dispel confusions arising from current discussions of fiscal and monetary policies. In sadness more than anger he reports he didn't find many clues—because he found too many. He was tempted to throw up his hands. Indeed at the end, despairing of consensus among economists on monetary policy, he passes the buck to politicians. But he had persevered to the extent of guessing that economists might generally agree that growth of high employment federal deficits should be arrested, by tax increases enacted soon but with “largest revenue impact later in the 1983–87 period.”

I thank Rudy for his patient journey through the journals and for the report of his travels. I admire his eclecticism and agnosticism. Still I wish he had worried less about constructing an economists' consensus—you can't make a silk purse out of dozens of sows' ears—and more about stating his own considered views. In commenting on some of the subjects of Rudy's paper, I shall be less bashful.

Life Cycles, Liquidity Constraints, and Bequest Motives

As Rudy's account tells us, theories of saving conflict violently and statistical tests are not powerful enough to choose among contradictory extremes. So what should sensible fellows like Rudy and me believe?

What is the horizon of a consumer, household or individual? By horizon I mean the time ahead over which a consumer will spread an accretion to her current liquid resources. A snapshot cross-section would surely reveal wide variation. Some consumers are living hand-to-mouth, some from paycheck to paycheck. For some young families the horizon is the span of years until higher earnings will permit accumulation of liquid wealth. Thereafter their horizons will be remaining lifetimes or longer. Probably some consumers' horizons are in effect unbounded; these individuals are free of liquidity constraints and, as Barro postulates, internalize descendants' utilities and resources ad infinitum.

Because many persons who would like to consume today future wages, retirement benefits, and other assets cannot do so, Penner is right to reject the so-called equivalence theorem. Hence government deficits do absorb saving for good or ill, and even temporary tax changes and transfers affect consumption. Likewise Feldstein's estimate of the displacement of productive capital by “social security wealth” and other unfunded pension rights

*Sterling Professor of Economics at Yale University.

is an upper limit. Liquidity-constrained workers cannot fully offset compulsory pension contributions by dissaving, and retirees with horizons beyond their own lifetimes save part of their pensions. Their commonly observed strategy—provide against the risk of prolonged life with expensive infirmities, in the comforting knowledge that heirs will enjoy any remainder—is perfectly rational.

The life cycle model is a very useful tool if not taken literally. The model can easily handle liquidity constraints; it generally predicts that their presence will increase aggregate wealth and saving. It can also handle bequests and other intergenerational transfers, more easily if their amounts rather than descendants' or parents' utilities enter the individual's utility function. Without such amendments the model has trouble accounting for observed aggregate accumulations of wealth, especially over periods when retirement spans were much shorter than now.

What is the effect of the after-tax rate of return on aggregate wealth and saving? Theory can't tell us, and econometric inference encounters in extreme measure the usual tedious litany of ambiguities. Yet many, many economists including Rudolph Penner take for granted the premise of "supply-side" policy that capital is overtaxed. If the feared explosion of public debt is to be averted and if, as Penner observes, the path of federal expenditures cannot be cut appreciably this decade, then taxing capital less means taxing labor more. It may be true that the shift will increase wealth and welfare, but tighter argument and evidence than Penner reports are required.

I will illustrate the problem. The life cycle model implies that in a steady state of population and economic growth aggregate wealth is a multiple of after-tax wage income. The numerical size of the multiplier depends on the age distribution, the age profile of wages, the incidence of liquidity constraints, the utilities of consumption of adult and minor household members at different ages, and other factors. Assuming these constant, the multiplier depends on the after-tax return to saving. To simplify, I assume the elasticity of this dependence to be constant. I assume also that aggregate wealth is physical capital, that output is produced by capital and labor and distributed to them à la Cobb-Douglas, and that the government purchases a constant share for public consumption financed by distinct proportional taxes on capital income and wage income.

A shift of tax burden from capital to labor will increase the wealth multiplier assuming the relevant elasticity is positive, but decrease after-tax wages, the multiplicand. It will not necessarily increase steady-state stocks of wealth and capital. The pair of tax rates that maximizes these stocks depends on the parameters. I don't know how anyone, even Larry Summers, can *a priori* dismiss as requiring an "odd utility function" the possibility that the elasticity of the multiplier with respect to after-tax return is so low that the maximum is reached with a wage tax rate lower than that on capi-

tal income. Relegating algebra to a footnote¹, I give here the intuitively satisfying solutions.

Let e be the fraction of output the government consumes, t_k and t_w the tax rates on capital income and wage income respectively, α the elasticity of output with respect to capital and the pre-tax share of capital, and σ the elasticity of the multiplier with respect to the after-tax return to saving. The wealth-maximizing values of t_k and t_w are

$$t_k^* = e + (1 - e) \frac{(\alpha - \sigma(1 - \alpha))}{\alpha(1 + \sigma)} \quad \text{and} \quad t_w^* = e - (1 - e) \frac{(\alpha - \sigma(1 - \alpha))}{(1 - \alpha)(1 + \sigma)}.$$

Thus $t_k^* = e = t_w^*$ if $\sigma = \alpha/(1 - \alpha)$, $t_k^* > e > t_w^*$ if $\sigma < \alpha/(1 - \alpha)$, and $t_k^* < e < t_w^*$ if $\sigma > \alpha/(1 - \alpha)$. For example, if $\alpha = 1/3$, the dividing line for σ is $1/2$. If σ is $1/4$, and e is $1/4$, $t_k^* = .55$ and $t_w^* = .10$. On the other hand, if σ is 1 and e is $1/4$, $t_k^* = -.125$ and $t_w^* = .44$.

Of course, maximization of wealth and capital is not welfare optimization. Other allocative effects of taxes are relevant, like the labor supply effect Penner mentions. Moreover, one might seek an optimal capital stock defined by the condition that its pre-tax rate of return equal the economy's growth rate plus a social discount rate related to the growth rate of per capita income due to technical progress. If this stock were obtainable given the government consumption share e , there might be various pairs of tax rates that would do the job.

Are governments and corporations mere veils? Are their savings and dissavings automatically offset by equal opposite shifts in household saving? Sensible persons like Rudy and me will believe that institutions exist because they matter and will not ascribe presumptive truth to Modigliani-Miller theorems, Ricardo-Barro equivalences, or Denison's law of stockholders' "ultra-rationality." Agreeing with Penner, I have already expressed my skepticism of the equivalence theorem for government finance.

¹Let k be capital per unit of effective labor (per person-hour augmented in productivity by technical progress). Let net output per labor unit be k^α . Pre-tax return to capital r is $\alpha k^{\alpha-1}$, and pre-tax wage w per labor unit is $(1 - \alpha)k^\alpha$. After-tax factor rewards are $u_k r$ and $u_w w$ where $u_i = 1 - t_i$. Steady state wealth demand is $v^*(u_k r)^\sigma u_w w$, where v is a constant determined by the demographic and other factors mentioned in the text. The two basic equations are:

$$(1) \quad v^*(u_k r)^\sigma u_w w = k \quad \text{wealth} = \text{capital}$$

$$(2) \quad \alpha u_k + (1 - \alpha) u_w = 1 - e \quad \text{government budget balance}$$

Substituting the expressions for r and w in terms of k into (1) and taking logs gives:

$$(3) \quad \sigma \ln \alpha u_k + \ln (1 - \alpha) u_w + \ln v = (1 - \alpha)(1 + \sigma) \ln k$$

Assuming $\sigma > -1$, k will be maximized by maximizing the left hand side of (3) subject to the constraint (2). This gives the results in the text.

Similar reasons for skepticism apply to corporate saving: differences between companies and their owners in borrowing rates, liquidity constraints, taxes, and objectives. Retained earnings do not translate into additional wealth for shareowners unless and until they raise market values of shares. If and as they do, the extra wealth will increase household consumption at the expense of personal saving. But the process is slow and uncertain. Unfortunately, there is little evidence that households have saved extra to make up for the real capital losses they have suffered on the stocks and bonds they directly or indirectly own in the recent past. That, by the way, casts doubt on the relevance to crowding-out concerns of inflation-accounting corrections interest to outlays in the federal budget.

The Federal Budget and the Macroeconomic Outlook

I turn to Penner's discussion of the current scene. I will not refrain from calling attention to the irony of the general preoccupation with the adequacy of national saving at a time when the country's propensity to save is patently not the constraint on the formation of capital. Who is crowding out what? Tight monetary policy brought record high real interest rates, devastated interest-sensitive spending, and generated the severe recession. The recession further damaged capital formation and ballooned federal budget deficits. To complain that those deficits are crowding out private investment by raising interest rates is to tell the story inside out.

A two-point reduction of unemployment would increase GNP by about 4 percent, some \$120 billion, of which about half would be additional saving by governments, businesses, and households. Does anyone know a supply-side incentive or a deficit-reducing measure that could do as much for saving and investment as soon?

I know of course that the Fed didn't bring the economy and investment to their present low states for the hell of it. They did it to conquer inflation, and in their zeal probably did more than they intended. I just think we and they should be clear about where to charge the costs, not shift them to the federal budget. Rudy Penner is, I think, overgentle to what it is fair to call the Feldstein policy mix, tight money and high real interest rates to shift resources from consumer durables and housing to business capital favored by incentive tax cuts. Just as wet-blanket Keynesians foretold in early 1981, the strategy didn't work.

Forecasters looking for bright spots in the outlook for the next five quarters invariably seize on "the consumer," buttressed by tax cuts this year and next and by gains in indexed transfers, and on the beginnings of the defense build-up. Yet economists of many camps, financial pundits with unanimity, and liberal and old-line conservative politicians of both parties joined the Administration in hailing recently enacted tax *increases* as a big and necessary step toward recovery. Though the legislation will hit some consumption, its main impact is to diminish business saving and investment by withdrawing about half the concessions to capital income enacted only a year before. If the perceived danger was that government borrowing would congest the financial markets and crowd out business investment, it is hard

to see how the 1982 bill was a remedy. Businesses that curtail investment plans are crowded out for sure. Businesses that maintain them will in effect borrow to pay taxes; their demands on credit markets replace those of the Treasury. It would be nice if people who worry about the budget would be clear about their objectives: recovery? capital formation? political cosmetics?

Like Rudy, I am disturbed by the prospect that deficits even in prosperity will combine with high interest rates to raise the debt/GNP ratio throughout the decade. I attach an appendix on the dynamics of this ratio, with calculations showing how dramatically Reagan fiscal policy reverses the history of the past 30 years. Yet hysteria may be not only premature, so far is the economy from full recovery, but also overdone. My calculation does not indicate Sargent-Wallace instability, a real net interest rate greater than the economy's growth rate. If, as my table indicates, the ratio should in the next 10 years return to its level of the 1950s, around 50 percent, this is not a catastrophe. As Penner says, there are some natural correctives short of hyperinflation. The defense build-up, we can hope, is a bulge; if not, the need for taxes to pay for it will become pretty clear.

An interesting analytical question raised in Penner's discussion is whether "measures to reduce deficits in the 1984-87 period would actually have a stimulative impact in 1983 even within the context of a Keynesian model." Rudy's tentative "yes" is based on the stimulative effect of reducing uncertainty: Investors are pretty sure those deficits will be corrected, but they don't know how. They would go forward today if they knew the corrections would be soundly made. Does that condition cover additional doses of 1982 "fiscal responsibility" medicine? I was stimulated to investigate the question in a more Keynesian spirit.

Consider, as in Rudy's question, two periods in neither of which is there full employment. In each period the short-term interest rate r depends solely on contemporaneous GNP Y and on the stock of transactions money M , according to the familiar LM relation. But the position of the first period IS curve depends on the correctly expected outcomes (Y_2, r_2) of the later period. The expectations allow for the effects of fiscal and monetary policies in the second period.

Investment and consumption in period 1 will be lower the higher is the expected interest rate r_2 ; a higher future short rate deters current spending by lowering the present values of earnings from capital and labor. The period 1 IS curve will, however, be shifted right by increases in expected GNP Y_2 , which raise those expected earnings. Given M_2, r_2 and Y_2 are tied together by the second period LM curve. If it is fairly flat, moving up and/or right along it will shift first period IS to the right; the effect of higher Y_2 will dominate that of higher r_2 . But if LM is quite steep the reverse will be true. Moving down and/or left along LM will shift first period IS to the right. This latter is what a correctly anticipated tightening of period 2 fiscal policy would accomplish. In the steep LM scenario future budget corrections would increase aggregate demand today.

However, in this case the LM curve of period 1 will also be steep. Most of the effect will be to raise r_1 rather than Y_1 . Nothing in this Keynesian

scenario supports the common story of the financial press, by which future fiscal tightening lowers short interest rates both tomorrow and today. And nothing in my story "stands Keynes on his head." The major effect of tightening fiscal policy later is to weaken aggregate demand then, which may or may not be a good idea. The expectational effect, possibly strengthening aggregate demand today, is at best a partial offset. In contrast, a future easing of monetary policy, raising M_2 , would lift Y in both periods.

Figure 1 is a picture worth the above two hundred words.

Full discussion of a two- or multi-period model of this kind is beyond the scope of this comment. There are other interrelations between periods. Stocks of wealth, capital, and public debt carried over from one period to the next affect behavior in the later period. So do price level and inflation rate transmitted from one period to the next, especially if nominal M targets remain fixed. But I think the simple story of the previous paragraph is the major mechanism relevant to the question Penner raised.

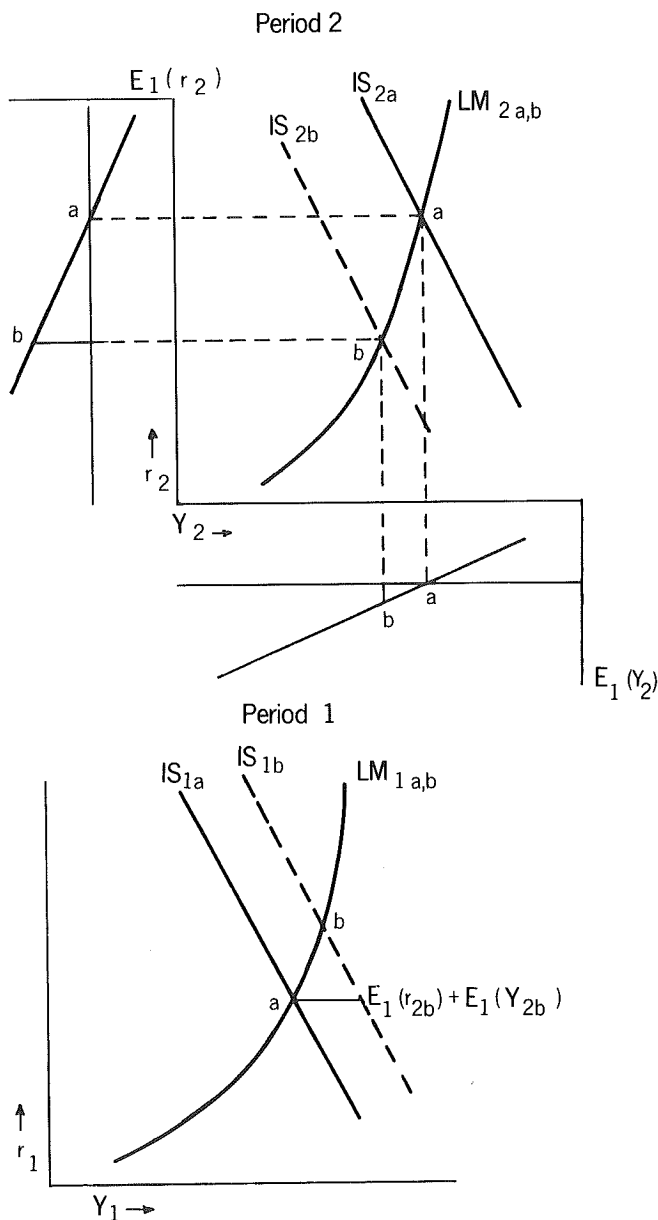
As I mentioned at the start, Rudy despaired of finding or building consensus on whether fiscal tightening should be accompanied by monetary easing. He did not even tell us his own view. I think monetary policy is the key to recovery. Tightening of fiscal policy will, to be sure, help to provide a policy mix more favorable to capital formation. But the effort will be wasted unless the Fed engineers low enough real interest rates to absorb in investment the resources released by government, its taxpayers, and its transferees—plus a big fraction of the resources made idle by the recession. I can see the logic of those who do not want to see recovery until inflation is completely vanquished. I cannot understand the logic of those who would welcome recovery should it occur by a miraculous surge of monetary velocity but reject equivalent growth of money supply. They fear that a burst of money supply growth, albeit temporary, would be entirely dissipated in renewed inflation and have no real effects. Or they fear that enough others believe primitive monetarist stories to make them come true. Penner doesn't count those expectations as rational, and neither do I. It is a sad day when irrational models, for which our profession is in large measure responsible, immobilize macroeconomic policy.

Appendix: Fiscal and Monetary Policies and the Dynamics of Federal Debt

The present combination of high interest rates and large budget deficits raises the question whether deficits and debt will grow faster than the economy. Does a one dollar deficit increase the interest service on the debt so much that, with given expenditure and tax programs, the deficit and the debt are higher relative to GNP the following year?

Suppose that the budget of year t involves a *primary deficit* of $x_t p_t y_t$, where p_t is the price of commodities and y_t is real GNP. The primary deficit excludes outlays for interest on the debt and receipts from taxes on debt interest. Net interest outlay is $i_t^B B_{t-1}$, where B_{t-1} is the outstanding stock of publicly held interest-bearing debt and i_t^B is the nominal interest rate paid on it allowing for the tax recoupments. The total debt, including that part,

Figure 1



Tightening period 2 budget shifts IS_2 and lowers Y_2, r_2 from a to b . $E_1(r_2)$ and $E_1(Y_2)$ (both zero at a) are effects on aggregate demand in period 1. Their sum at b is the horizontal shift of IS_1 in the period 1 diagram below. It raises Y_1, r_1 from a to b . Imagining a flatter LM_2 through a , you can see how the IS_1 shift could be reversed.

H_{t-1} , monetized by the Federal Reserve is D_{t-1} . Thus the nominal interest rate on the total debt is $i_t^D D_{t-1}$ where

$$(1) \quad i_t^D D_{t-1} = i_t^B B_{t-1} = i_t^B (D_{t-1} - H_{t-1}) = i_t^B D_{t-1} \left(1 - \frac{H_{t-1}}{D_{t-1}}\right)$$

The dynamics of deficit and debt are as follows:

$$(2) \quad D_t - D_{t-1} = x_t p_t y_t + i_t^D D_{t-1}$$

Let d_t be the ratio $D_t/p_t y_t$. If y is growing at rate g_t and p is increasing at rate π_t , then

$$d_{t-1} = \frac{D_{t-1}(1 + \pi_t)(1 + g_t)}{p_t y_t},$$

and from (2)

$$(3) \quad d_t - d_{t-1} \left(\frac{1 + i_t^D}{(1 + \pi_t)(1 + g_t)} \right) = x_t$$

Define the real interest rate on federal debt as

$$(4) \quad r^D = \frac{i + i^D}{1 + \pi} - 1 \approx i^D - \pi, \text{ so that}$$

$$(5) \quad d_t = d_{t-1} \left(\frac{1 + r_t^D}{1 + g_t} \right) + x_t \approx d_{t-1} (1 + r_t^D - g_t) + x_t$$

With constant primary deficit x , constant real interest on debt r^D , and constant real growth g , the stationary equilibrium debt/GNP ratio would be:

$$(6) \quad d^* \approx x/(g - r^D)$$

This equilibrium is stable if g exceeds r^D and unstable if r^D exceeds g :

$$(7) \quad (d_t - d^*) \approx (d_0 - d^*) (1 + r^D - g)^t$$

In the Table, average values of x , r^D , g are shown for five historical periods since 1951 and for the Congressional Budget Office (CBO) February 1982 baseline projection for the period 1982–87. Corresponding equilibria d^* are also computed, each designed to show the hypothetical long-run consequences for d of continuation of the fiscal, monetary, and economic environment of the period or projection.

Here are the noteworthy features of the Table:

1. All the situations are stable; the real growth rate always exceeds the real net interest rate on debt. This is true even for the CBO baseline projection of 1982–87. However, the CBO may have overestimated inflation, underestimated interest costs, and possibly overestimated real growth.

2. Only in 1980–81 and in CBO 1982–87 projection is the initial debt/GNP ratio smaller than the hypothetical equilibrium. Only in those cases, then, has the constellation indicated a value of d increasing over time. In the case of the CBO projection, which implies an eventual debt nearly twice GNP, the rise in d is quite rapid.
3. The primary deficit was on average negative in the first two periods, from 1952 to 1966, and the combination of high real growth and negative r^D brought rapid reduction of the high debt/GNP ratio inherited from World War II. This continued through most of the next 15 years. Even though the primary deficit turned positive, the real interest rate was very favorable.
4. After the dramatic increase in monetization (about 50 percent of deficits between 1958 and 1974), Fed policy has reduced seignorage to negligible amounts. This is of course a major reason for the rise in r^D to positive values.
5. These calculations do not touch on the asset-demand side of equations, i.e., what debt interest rates are necessary to induce the public to hold debt in the indicated ratios to GNP. It could well be that the increasing rates necessary in the final column could impart instability to the process.

U.S. Fiscal and Monetary Policy and Federal Debt Dynamics 1952–1987

Period, Fiscal Years: (number of years)	1952–1957 (6)	1958–1966 (9)	1967–1974 (8)	1975–1979 (5)	1980–1981 (2)	1982–1987 (6) CBO Baseline
1. Federal debt: % of GNP, beginning and end of period	64.8–48.5	48.5–35.7	35.7–23.4	23.4–26.5	26.5–27.6	27.6–38.0
2. Federal deficit (+) or surplus (–), exclud- ing interest: % of GNP, avg.	–0.58	–0.47	+0.28	+1.38	+0.80	+2.58
3. Share of debt monetized: %, range	10.5–11.3	10.7–16.6	16.6–24.0	24.0–18.1	18.1–15.7	15.7–8.0
4. Share of deficit (in- cluding interest) monetized: %, avg.	0	50	46	12	6	2.6
5. Growth of real GNP: % per yr., avg.	2.8	3.4	3.8	3.5	0.9	3.1
6. Inflation of GNP de- flator: % per yr., avg.	2.2	1.9	5.2	7.2	9.1	6.4
7. Treasury 90-day bill rate: % per yr., avg.	2.1	3.2	5.8	6.7	12.8	10.4

(cont'd. next page)

U.S. Fiscal and Monetary Policy and Federal Debt Dynamics 1952–1987 (cont'd.)

Period, Fiscal Years: (number of years)	1952–1957 (6)	1958–1966 (9)	1967–1974 (8)	1975–1979 (5)	1980–1981 (2)	1982–1987 (6) CBO Baseline
8. Real net interest rate on debt: % per year, avg.	–0.7	–0.7	–2.8	–2.8	–0.1	1.7
9. Real GNP growth less real net int. rate	3.5	4.1	6.6	6.3	1.0	1.4
10. Hypothetical equi- librium debt/GNP ratio: %	–16.6	–11.5	+4.2	+21.9	+80.0	+184.3
Indicated Trend of Debt/GNP Ratio:						
11. Actual, beginning of period	64.8	48.5	35.7	23.4	26.5	27.6
12. After five years	51.9	37.6	27.1	23.0	29.1	38.1
13. After 10 years	41.1	28.6	20.8	22.7	31.6	48.0

NOTES

1. Debt held by Federal Reserve and by nonfederal owners, par value, at end of fiscal year, relative to nominal GNP for fiscal year, from fiscal year preceding the period to final year of period.
2. Sum of National Income Accounts deficits less surpluses for period, relative to sum of nominal GNP for period. Debt interest outlays (calculated by subtracting Federal Reserve payments to Treasury from "Net Interest" line of budget) are excluded in calculating deficit or surplus, as are estimated tax receipts recouped from such outlays, estimated at 25 percent.
3. Monetized debt is the amount held by the Federal Reserve. The denominator of the ratio is, as in line 1, the monetized debt plus the debt held outside the federal government.
4. The increment of monetized debt from beginning to end of period, divided by the increment of total debt as defined in line 1.
8. $[\text{line } 7 \times .75 \times (100 - \text{line } 4)/100] - \text{line } 6$. The average Treasury bill rate for each period is taken to be the permanent cost of financing new debt and refinancing old debt, which is reckoned at par value, given the conditions and policies of the period. It is multiplied by .75 on the assumption that the Treasury recoups 25 percent of nominal interest outlays in taxes. The third factor reduces the net interest cost for "seignorage," the fraction of the debt monetized by the Federal Reserve. Subtracting line 6 converts the net nominal interest rate on the debt to a real rate.
9. line 5 — line 8.
10. line 2/line 9. A negative figure means that the hypothetical equilibrium debt/GNP ratio is negative, i.e., the government would be a net lender to the private sector.
- 12, 13. $[\text{line } 11 - \text{line } 10] \times [(100 + \text{line } 9)/100]^{-n} + \text{line } 10$. See text.