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## Taxes, Saving, and Macroeconomics

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## Taxes, Saving, and Macroeconomics

*Neil H. Buchanan*

*[To institute tax incentives] on the assumption that they will have commensurate effects in increasing investment must . . . rest essentially on faith. Faith is indeed sometimes rewarded. But for our part, in this instance, we remain agnostic.*

—Robert Chirinko and Robert Eisner, 1983

Proposals for tax reform have been part of the American political landscape for as long as there have been taxes. However, with the Republican party majority having taken over both houses of Congress in 1995, a serious political movement arose to reform the tax system in a much more radical way by "tearing the current system out by its roots," in the words of U.S. Representative Bill Archer. The general idea is that we should replace the current income tax-based system with one of a variety of systems intended to raise the U.S. economy's long-term growth rate through encouragement of saving. Saving, it is claimed, leads to higher investment, productivity, international competitiveness, and long-term economic growth.

As radical as the political rhetoric has been, the basic economic reasoning behind these plans is anything but new. Neoclassical economists have been calling for ways to increase saving for decades. Even 50 years ago, James Tobin [1949] could reasonably describe such efforts as having "a long history." Moreover, politicians have taken this advice to heart. While the United States, along with every other industrialized country, continues to use an income tax system, inducements to saving have always been a politically popular part of the tax code (a fuller discussion of which is provided below). As is so often the case, therefore, everything old in politics is new again. There is another saving "crisis," and the tax code can set everything right.

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Most analyses of the various proposals to date (including the so-called Flat Tax, a national sales tax, the "USATax," etc.) have concentrated on the distributional impact of the plans, along familiar lines of progressivity and regressivity. Surprisingly little critical attention has been paid to the macroeconomic implications of these tax reform plans, particularly to the claims about saving. This essay will offer such an analysis by reviewing recent work on causal relationships crucial to the political arguments of those who favor changing the tax code as a way to increase saving. I will also review arguments well known to most readers of this journal that are too often overlooked in public discussion.

### *Saving in the United States*

It would be difficult to find more agreement about the desired direction of a non-policy variable than the rate of saving in the United States. Virtually everyone with an opinion on the subject seems absolutely certain that saving is currently too low and needs to go up if the future is to be saved (no pun intended). The very repetition of this conclusion, moreover, creates its own legitimacy, causing those without a well-thought-out opinion on the issue to adopt it as a default and intimidating those who would dare to question this obvious "truth."

Since the concept of "saving" is often defined in inconsistent and contradictory ways, it is useful and important to look at alternative definitions of the term and to examine the trends in various measures of saving in the U.S. economy. Among other things, this investigation will show that the most inclusive and macroeconomically important saving rates are *not* moving downward.

Of course, institutionalists have long known that the concept of saving is broadly misunderstood. Several good examples of institutionalist critiques of the mainstream approach to saving and fiscal policy have appeared in this journal. The interested reader should consult Walter C. Neale [1991] and L. Randall Wray [1989, 1992].

### *Difficulties in Defining Consumption and Saving*

In discussions of an economy's rate of saving, it is common to emphasize the rate of personal saving—the ratio of take-home pay not spent on goods and services to total take-home pay. In a good example of the run of academic papers concerned with the decline of saving in the United States, Lawrence Summers and Christopher Carroll [1987] analyzed estimates from the National Income and Products Accounts (NIPA) and traced a decline in the personal saving rate (more specifically, the annual rate of personal saving as a percentage of disposable private income). In the early 1970s, this rate averaged more than 8 percent, while it had fallen to near 5 percent by the mid-1980s, or a decline of more than one-third from its initial value.

By 1994, according to government statistics, the rate had fallen further, to just under 4 percent, although it bounced back to nearly 5 percent in 1995 (with roughly \$250 billion in saving, and disposable income nearing \$5 trillion).

However, it is important to clarify just what the term saving means in this context. Saving is being computed as the amount remaining from disposable income after subtracting consumption, interest payments made by individuals, and money paid to recipients abroad (as when a worker in the United States sends part of his or her income to family members living in other countries). Typically, the latter category is minuscule (totaling 0.2 percent of disposable income in 1995), while interest payments are more significant (usually amounting to more than half of total computed personal saving).

It turns out, however, that several of the items included in personal consumption expenditures are hardly examples of profligacy. Purchases of durable goods, such as automobiles, furniture, and appliances, are counted as consumption, not saving. Expenditures for education are similarly counted as consumption. In other words, what consumers do to invest in their long-term economic well-being is counted as consumption, rather than saving.

Since saving will increase every time that consumption decreases (assuming a constant level of disposable income—which is both a crucial assumption and an incorrect one), this means that a policy that decreases private expenditures on higher education, for example, would be saving-enhancing. It is worth noting, therefore, that more saving should not automatically be associated with being thrifty or farsighted in any meaningful sense.

For some reasons, of course, it is perfectly reasonable to define saving in the way that the government's statistics do. The problem is not the statistics, but the uses to which they are put. Nevertheless, the purest definition of saving would be the amount of resources produced in the economy in a given year that are not consumed today but are put to use in a way that will provide returns to the economy in years to come. (Not coincidentally, this is also the purest definition of investment.) The problem with the definitions of saving commonly used is that they imply that the household sector never makes any purchases that have long-term payoffs. Only private businesses do so.

Given this implicit bias in the accounting definitions, the tax code is then partially designed to encourage personal saving by taxing its opposite, personal consumption. However, to be truly consistent, the definition of consumption would also have to include those items that are consumed even though they are not paid for by direct out-of-pocket costs to the individual. Therefore, health care and most other employer-provided benefits, which are not currently taxed, would have to be taxed at the individual level if one viewed all consumption as bad and really wanted to discourage it. The value of owner-occupied housing would also have to be taxed, since homeowners are assumed to be receiving income (and making an identical consump-

tion expenditure) in the form of the rent that they are effectively paying to themselves. Middle-class (and especially elderly) people could find themselves taxed on rather large consumption expenditures that they never knew they had been making.

Looked at from a broader perspective, however, personal saving is not falling in the United States. Fred Block and Robert Heilbroner [1992] analyzed official data and found several areas where saving occurs but is ignored by the government's statisticians. The largest of these is capital gains distributions, which accrue to high-income individuals almost exclusively. Indeed, Block and Heilbroner point out that the trends in income distribution in the United States in the past 15 years make it hard to believe that there *could* be a decline in personal saving. Since high-income individuals are responsible for the vast majority of personal saving (see Bunting [1991] for a detailed distributional analysis of saving behavior), and since the distribution of income has become vastly more top-heavy, it would be strange indeed if there were a decline in private saving, properly measured.

It is noteworthy that Block and Heilbroner's suggested recalculation of the NIPA measures of saving matches up remarkably well with a measure of saving derived from the Federal Reserve's Flow of Funds accounts. Personal saving, appropriately measured, is simply not falling; and there is certainly no crisis that would require a complete rewrite of the nation's tax code.

Even if saving were lower today than it used to be, it is also not at all clear why it ought to go back up. Why is more better? There is no systematic analysis available that tells us how much saving we should be doing, nor whether the current amount is too high or too low. Indeed, Robert Gordon [1990] argued that the current level of saving in the U.S. economy was just about right, even at the time when the standard measures of saving looked their worst.

### *Business Saving*

More important even than the arguments noted above is the absence of business saving in most analyses of private saving. At the micro level (but, as I argue later, not in the aggregate), it is business saving that drives business investment. Business saving dwarfs personal saving in the official statistics, usually coming in at a level from three to four times greater than personal saving (\$814 billion in 1994, compared to \$192 billion in the official measure of personal saving).

Business saving is comprised of two items: undistributed business profits (also known as retained earnings) and capital consumption allowances (or depreciation). Since depreciation (which is usually at least five times greater than retained earnings and in some recent quarters has been as much as 10 times greater) is simply a recognition of the depletion of existing capital, it might be argued that this is really not saving at all. However, the depreciation allowances that show up in the national accounts are truly "allowances," that is, they represent business revenues that were set

aside and excluded from taxation. Businesses can then use those untaxed funds to purchase new capital. In many cases, moreover, the new capital is more productive than the old capital that is being replaced, as when an old computer system is replaced with a newer one.

Finally, business saving has been relatively constant as a percentage of disposable income (or of GDP). Since it has not fallen as a percentage of total income, it should be hard to argue that there is a need for drastic action to make the tax system more friendly to saving.

#### *Current Inducements to Save*

The current tax system, indeed, has been made saving- and investment-friendly by a long history of pro-saving legislation. Among the more well-known attempts to induce saving that have been added to the tax code in the past decade or so are Individual Retirement Accounts (which have been introduced, curtailed, and expanded, all, it must be noted, without any apparent impact on aggregate personal saving) and 401(k) and 403(b) accounts. Anti-consumption initiatives have also been passed, such as the elimination of the deductibility of interest on consumer debt (which was followed by further increases in consumer debt, casting further doubt on the efficacy of these measures in altering individuals' behavior).

As Eisner [1992] notes, most of the types of saving that matter are already untaxed: unrealized and untaxed capital gains and untaxed pension fund contributions. The President's Council of Economic Advisors [1996] provides a short list of the various pro-saving, pro-investment, or anti-consumption elements of the current tax code. The largest of these is pension fund contributions, followed by investment in machinery and equipment (which, while they are subject to some taxation, receive favorable treatment), and life insurance savings proceeds.

#### *Tax Incentives, Saving, and Unintended Consequences*

Even if one were certain that personal saving should rise, however, there is no guarantee that tax policy aimed at raising saving will not have perverse effects. Since the experiments with IRAs and other tax innovations have had such mixed results, it is wise to be cautious about what can be achieved through the introduction of a tax code that "encourages" saving. Quite the opposite is, in fact, likely to occur.

The basic idea behind an anti-consumption tax is that we can induce people to save more if we offer relatively favorable tax treatment to saving. This is true both of the plans that totally exempt saving from tax (such as the USATax, as written by Senator Pete Domenici and former Senator Sam Nunn) and those that merely ex-

empt interest on saving from tax (the most prominent of which is the so-called Flat Tax). In either case, the purpose is to decrease the opportunity cost of saving.

One way to investigate how people might respond to price incentives is to consider the inducement to saving that comes from a higher rate of interest on a simple savings account. Since there have been many more studies on the interest-to-saving connection than on the taxes-to-saving connection, this logical equivalence is very useful. Those studies [among others, see Howrey and Hymans 1978; Campbell and Mankiw 1989] come to the near-unanimous conclusion that raising the rate of interest on savings accounts (broadly defined) does not raise saving. Indeed, there is apparently no reliable connection between these two variables at all—just as there is no discernible connection between interest rates on loans and real investment (see below).

Not only does the vast majority of empirical work demonstrate that a better return on saving does not increase total personal saving, but even the most standard microeconomic theory argues that this should not be at all surprising. After all, when people are faced with a better return (typically, a higher interest rate) on saving, they can either save more than they had been saving (due to their desire not to miss out on a good deal—the "substitution effect"), or they can save less because it is not necessary to set so much aside today in order to have the same amount in the future (the "income effect").

It is no more accurate, however, to conclude that people will definitely save less than before, only that it is unclear what they will do. We can only watch and see which effect will dominate in the real economy; and the empirical tests make clear that the American people have not responded to changes in the rate-of-return by altering their rate of saving in a predictable direction. In general, at least in response to changes in the rate-of-return, they do not alter their saving at all.

This does not mean that people are unaware of interest rates or of the tax consequences of their decisions. It merely means that, while they might try to earn the best return that they can on whatever amount of saving they plan to do, they do not alter their total level of saving in response to these incentives. The best example of this is Individual Retirement Accounts (IRAs), which were invented for the precise purpose of increasing saving, but which instead led to the shifting of funds from taxable savings accounts into IRAs. Indeed, the aggregate (measured) U.S. personal saving rate continued to decline in the years following the introduction of IRAs.

The recent studies on saving by, for example, John Campbell and Gregory Mankiw [1989], Christopher Carroll and Andrew Samwick [1995], and others also indirectly confirm this behavioral regularity. They find that people are so-called "rule of thumb" savers. Most people use a simple rule to determine how much to save (for example, a person might decide to save \$100 per month), rather than calculating and responding to changes in the cost of consumption and the returns to saving.

Suppose, however, that a hypothetical tax break actually did end up increasing private saving. This is still not sufficient to make the plan a success—even by the reckoning of orthodox theory. Since national saving includes both private saving and government saving, it is necessary that the increase in private saving more than make up for any tax revenue that is lost in the effort to give savers a tax break. In practice, this means ensuring that an increase in private saving is not merely a reflection of people taking their tax cut and putting only a fraction of it in the bank. Instead, they must actually increase the amount of their saving by *more than* the dollar amount of the tax cut.

Any plan to increase saving, if it is to continue to collect the same amount of revenue as the current system (and thus not increase the fiscal deficit), must raise tax revenues from some people to pay for reduced tax revenues from others. If everyone changed their behavior toward more saving, it would not be possible to make up the lost tax revenue (if we continue to assume that income is constant). This implies that there must be a group of people whose consumption is non-responsive to tax changes, while there is another group that does respond to tax incentives. The tax burden is then shifted onto the former group. It should not be surprising that the latter group, which will see its taxes decreased, is also known as "high-income households," who will be rewarded for the saving that they would do even in the absence of tax incentives.

The distributional consequences of taxing consumption are likely to have a further perverse effect on saving. There is extremely strong evidence that people—when faced with difficult economic circumstances—will devote extraordinary amounts of creativity to maintaining their current level of consumption. The recent work on "loss aversion" [see, for example, Thaler 1992] is particularly revealing in this regard. Loss aversion denies the standard notion that taking \$1 away from a person will decrease their happiness by (roughly) the same magnitude as giving \$1 to the person would increase it. Employing experimental and survey techniques, Richard Thaler has concluded that losses are, in fact, perceived to be twice as bad as gains (of the same size) are good.

Loss aversion is in rough accordance with the "relative income hypothesis" [Duesenberry 1949], which states that the marginal propensity to consume is substantially lower in response to declines in income than it is to increases in income. Under either theory, raising tax rates on consumption will not have a sizable impact on consumption because people will fight to continue to consume what they have grown accustomed to consuming.

A recent study [Brown 1994] has looked at the 20 years of declining real incomes for middle- and lower-middle-income workers in the United States between the early 1970s and the early 1990s. The evidence shows that the response to lower incomes has been to decrease saving and take on more consumer debt, a pattern that was not interrupted by the elimination of the tax deductibility of interest payments



on consumer loans. Moreover, this evidence indicates that the decrease in saving coincided exactly with economic changes that would typically be expected to decrease consumption: lower real incomes and adverse tax changes.

This evidence indicates forcefully that anti-consumption taxes are likely to fail. For better and for worse, this is a consumer society. Trying to decrease people's consumption is difficult to impossible even with large, direct changes in the variables that matter most. Changes in variables that are only indirectly important are unlikely to meet with greater success.

For pro-saving policies to have any chance of succeeding, they must be designed to change people's behavior as their incomes rise, not to reallocate their saving and spending with stagnant income. That is, people could potentially be induced to save a larger fraction of their future increases in real income than they otherwise would. They might tenaciously spend \$30,900 per year from a \$31,000 net income, no matter what the tax code does to the relative price of saving and investment; but an increase in their net income to \$34,000 might allow them to respond to tax incentives, allocating \$500 of the increase to saving rather than, say, \$50.

This, however, requires that people's real incomes actually rise, which makes it all the more important not to adopt policies that intensify the current stagnation of earned income. A stagnant economy will not respond to saving incentives, but a prosperous economy might.

To summarize, there are two ways that one might hope to raise the overall rate of personal saving: (1) shift income from the non-savers to the savers, which is the essence of a regressive, "trickle-down" approach, or (2) induce every person to save more, on average, than they are currently saving. In order to achieve the second goal, however, one cannot simply rely on changing the relative prices of saving and consuming through adjustments in the tax code. Rather, it is necessary to create prosperity in both the short run and the long run.

### *The Macroeconomics of Saving*

Based on the arguments just presented, it is apparent that there is neither a shortage of saving nor a reasonable expectation that tax changes can induce people to save more than they currently do. For the purposes of this section, however, both of these arguments will be set aside. Instead, this section will attempt to answer the following question: *If* there really is an inadequate amount of saving in the United States, and *if* the tax code could actually induce people to save more, what would be the consequences of that policy change?

The logic in favor of savings enhancement has been repeated so often that it has become seemingly unassailable. Savings creates investment, and investment causes growth. It turns out, however, that this straightforward logic is not as reliable as it seems. This section will show that the reasoning behind the desire to increase sav-

ing—even if the measurement and policy-effectiveness issues are set aside—is questionable at best.

### *The Accounting Identity*

The desire for higher national saving is not based on the proposition that more saving is an end in itself. Rather, more saving is believed to lead to more investment, which will presumably lead to higher rates of economic growth and, thus, to higher standards of living for all Americans. The analysis must focus not on saving, but on investment as the actual variable that policy is attempting to increase. The first step is to show how saving and investment are related.

A basic macroeconomic accounting identity demonstrates that the sum of private saving, net taxes, and imports (known collectively as leakages or withdrawals) equals the sum of private investment, government purchases, and exports (together called injections). This identity can be rearranged in any number of ways, but one commonly used version exploits the definitions of the fiscal deficit (government purchases minus net taxes) and net foreign investment (exports minus imports, or the current account balance<sup>1</sup>) to demonstrate that private saving is equal to private domestic investment plus the fiscal deficit plus net foreign investment. Subtracting the fiscal deficit from private saving defines "national saving," which is obviously then equal to private domestic investment plus net foreign investment. This formulation has pernicious and misleading implications about cause and effect, but it is at least true.

Once the accountants set up the definitions of what is measured by each variable, this equation must hold. The equation is meaningless, however, unless one understands the definitions of each of its variables. Four clarifications are in order. First, while the type of investment that is usually considered crucial for economic growth is plant and equipment (P&E) spending, private domestic investment in the context of this identity includes two additional categories of spending: businesses' inventory accumulations (or, when negative, inventory draw-downs) and residential construction. Therefore, it is possible that "investment" could rise in the identity without implying an increase in the type of investment that macroeconomists believe increases long-term growth.

Second, national saving is the sum of private saving and government saving, and government saving goes down when tax revenues go down. As discussed above, it is not enough merely to increase private saving; the increase in private saving must be larger than any decrease in tax revenues associated with the saving-incentive programs.

Third, recall from above that private saving includes business saving as well as personal saving. It is not sufficient to look at the effect of a tax plan on personal saving without also looking at business saving. It turns out that business saving is a

more important determinant of P&E spending and is very likely to be lowered by the anti-consumption tax schemes.

Fourth, government purchases include purchases of both consumer goods (food for a military cafeteria, for example) and investment goods (a new runway for a government-owned airport). Therefore, this category combines both consumption (which is presumed to be bad) and investment (which is defined to be good).

Given the accounting definitions, any increase in private saving must be accompanied by more private domestic investment, more net foreign investment, a higher fiscal deficit, or some combination thereof. A key question for policy is the proportions in which these variables change. For example, if any increase in saving were to be followed by an exactly matching increase in the fiscal deficit, this would defeat any attempt to increase private investment. (Note, however, that it would not necessarily defeat the purpose of increasing *total* investment, since the higher fiscal deficit might have been used to finance investment in such things as public infrastructure and education.)

However, sorting out the likely proportions of the changes in these variables is beyond the scope of this simple accounting identity, since it is merely a mathematical fact and not a behavioral theory. In algebraic terms, the existence of this identity simply says that the six variables under consideration cannot have six separate behavioral equations, each independently determining the values of those variables. At most, there can be five behavioral equations, with the identity closing the system of equations. While this is an important constraint, it says absolutely nothing further about the relationships among the six variables. Therefore, one goal of macroeconomic analysis is to determine the nature of the behavior behind these variables.

The prevailing orthodoxy assumes the following behavioral regularities: net foreign investment and the fiscal deficit are exogenous, which leaves a direct relationship between private saving and private domestic investment. Furthermore, it is assumed that the direction of causality is *from* private saving *to* private investment. Saving *causes* investment. This means, quite naturally, that we can increase private investment by enacting policies designed to increase private saving.

While this conclusion is often stated as if it were the only possible conclusion derivable from the accounting identity, note that it in fact requires the assumptions that four variables are exogenous (that is, non-responsive to changes in saving and investment) and, even more crucially, that the two remaining variables have a very specific cause-and-effect relationship. This is now a contestable theory, not an undeniable fact deduced from accounting principles.

As most readers of this journal will know, this theory has been contested on the grounds of the "paradox of thrift": When people try to save more, businesses sell fewer goods (since people are saving instead of spending). This results in layoffs, which results in people having less income from which to save. In the end, investment will still be equal to national saving, but neither will have risen. After all, why

would businesses invest in new machines when the machines they already have are producing goods that people have stopped buying? Thus, the paradox: people set out to save more and end up saving the same amount of money as before.<sup>2</sup> This means that saving has not gone up, so investment has not gone up either. As Clarence Ayres [1978, 49] once put it, "No one secretes rails by going without lunch."

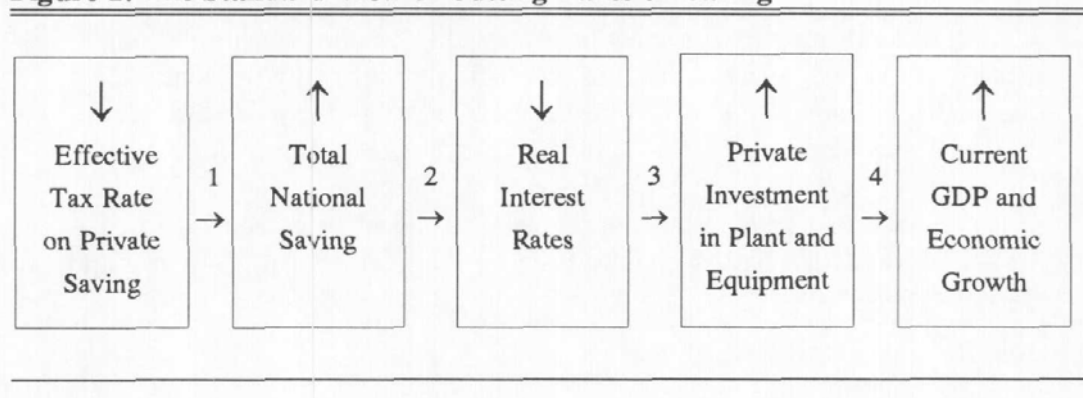
### *The Financial Connection*

What is conspicuously lacking in the preceding analysis is an explanation of the causal connection between saving and investment. That is, even if one were willing to concede that the four variables that comprise the fiscal deficit and net foreign investment are (at least in the aggregate) exogenous, why does more saving systematically result in more investment? A theory of investment behavior—preferably, of P&E investment behavior—is necessary.

The most prominent theory, enshrined in the textbooks, is summarized in Figure 1. Step 1, in which lowering the tax rate on saving results in more saving both individually and in the aggregate, has been dealt with above. It is Steps 2 and 3 that constitute the orthodox view of saving and investment: more saving will cause interest rates to go down, and lower interest rates will cause investment to rise. This theory is logically superior to the investment-equals-national-saving identity in that it actually is based on a notion of cause and effect. In addition, the cause-and-effect story is intuitively believable: more money is being saved, so banks do not have to pay as much interest on their depositors' accounts, which allows them to charge lower interest rates on loans to firms, who are only too happy to accept the loans to spend on investment goods.

That there is a theory does not, however, mean that the theory is true. This one, evidence indicates, is false both at Step 2 and Step 3. Step 2 is false because interest rates are determined, at least in their direction if not in their level, primarily by the Federal Reserve. The overall liquidity in the system is the primary determinant of

**Figure 1. The Standard View of Cutting Taxes on Saving**



interest rates, and the Fed can counteract any changes in overall liquidity that a tax change might cause. Therefore, the usual notion that more saving can lower interest rates ignores the effect of liquidity injections and withdrawals by the central bank.

The second half of this theory of investment (Step 3) is the basis of one of the most fundamental debates in all of macroeconomics: are interest rates (or, more broadly, the cost of capital) inversely related to investment? A strong answer to this is provided by the following collection of quotations from various macroeconomists:

It is well-known from the work on investment theory . . . that an analysis of profit-maximizing behavior . . . can at most offer a relationship between the desired stock of capital and the rate of interest, but not a relationship between the desired rate of increase in the stock of capital and the rate of interest. . . . Demand for a finite addition to the stock of capital can lead to any rate of investment [Foley and Sidrauski 1970, 44].

One of the best-established facts in macroeconomics is that business fixed investment and output move strongly together over the business cycle. By contrast, investment and the cost of capital are either uncorrelated or only weakly correlated [M. Shapiro 1986, 111].

. . . It is well known that to get the user cost [of capital] to appear at all in the investment equation, one has to display more than the usual amount of econometric ingenuity, resorting most of the time to choosing a specification that simply forces the effect to be there [Blanchard 1986, 153].

While standard economic theory predicts a link between capital costs and investment, the theory in its most general form does not make any quantitative predictions about how strong the link will be. Although some empirical work has addressed this issue, the results to date have been mixed. . . . The most important determinant of investment is the strength of the economy [Fazzari 1993, 10-11].

. . . It appears that investment is most sensitive to quantity variables (output or sales) with price variables having only modest effects [Chirinko 1993, 1883].

. . . In general, empirical studies of supposedly "interest-sensitive" components of aggregate spending have in fact had great difficulty in identifying a quantitatively important effect of the neoclassical cost-of-capital variable. Indeed, the most common finding is that nonneoclassical factors—for example, "accelerator" variables . . . have the greatest impact on spending. . . . Empirical studies that have tested the neoclassical model in its equivalent "Tobin's  $q$ " formulation have generally been no more successful [Bernanke and Gertler 1995, 27-28].

Even Dale Jorgenson, who has certainly shown evidence of a belief in the importance of the cost of capital variable, admits:

. . . Real output emerges as the most important single determinant of investment expenditures. Considered as a competing model of investment, the profits . . . model . . . is definitely inferior. . . . The introduction of financial considerations . . . necessitates substantial modification of the . . . model [Jorgenson 1971, 1141].

The available evidence, then, does not support the notion that lower interest rates will increase investment. Notice that the statements above are not saying merely that the state of the economy is more important than interest rates in influencing investment. They are saying that the state of the economy is the *only* thing that significantly affects investment, while the effect of interest rates (even holding the state of the economy constant) is small or nonexistent.

This lack of success in finding a connection between interest rates (or the cost of capital) and real investment has only encouraged researchers to look harder. One of the recent trends in this area of research has been derivation and testing of the Euler Equations of investment [the earliest example being Abel 1980]. This is done by hypothesizing how a typical firm would maximize the expected present value of real future profits, which allows one to derive mathematically how a firm would respond to changes in key variables when deciding how much to invest.

Not surprisingly, the Euler Equations derived from such a mental exercise indicate that investment decisions should depend crucially on the cost of capital in determining investment. The acid test is to see whether these derived equations actually match the data well. It turns out that they do not. A recent review by several researchers who have been active in the development of such models [Oliner, Rudebusch, and Sichel 1995] of the empirical research to date on Euler Equations concluded, in fact, that Euler Equation models are worse at predicting investment than even the unsatisfactory cost-of-capital models that they were designed to replace.<sup>3</sup> Moreover, it is still the case that the state of the economy predicts investment behavior better than any models that rely on the interest rate as a determinant of investment.

It turns out, however, that interest rates do matter for non-P&E investment, especially residential construction. This leaves open the possibility that the interest rate could indirectly affect P&E investment by improving the state of the economy and thus P&E. This effect has been tested by Steven Fazzari [1993], who concludes that this effect is too small to offset the negative impact of lower internal cash flow in determining the level of investment.

Even if saving caused investment, it is not true that personal saving finances plant and equipment investment (which, again, is the real focus of the tax policies under consideration here). As mentioned above, the vast majority of P&E is financed with a business's own internal funds [see, for example, Fazzari 1993]. Per-

sonal saving is unimportant to this aspect of investment, so attempts to raise personal saving will not raise P&E spending. Another way to look at the Paradox of Thrift, in fact, is to observe that increases in personal saving might lead to decreases in business saving, since firms will not have any earnings to retain if everyone tries to save more. Repealing the entire tax code in order to make household saving rise completely misses the point.

Finally, there is also the question of whether the magnitudes of the various changes will be large enough to have a meaningful impact on future economic growth. That is, even if changes in the tax code actually did cause all of the variables to change in the directions that proponents of these tax plans imagine they will, will the size of the changes make the political effort worthwhile? Almost certainly not. It turns out that it would take a huge increase in saving to have any appreciable effect on growth:

Studies of what makes the U.S. economy grow find repeatedly that technological innovation and improvements in the skills of the work force are six to seven times more important than business investment in plant and equipment in promoting higher productivity, growth, and incomes. As a result . . . , [t]o achieve a permanent 1 percentage point increase in the economy's growth rate, we would have to nearly *triple* our current saving rate [R. Shapiro 1996, 14-15; emphasis in original].

To put this into perspective, the U.S. rate of personal saving as a percentage of disposable personal income was 5.1 percent in the first quarter of 1995. The highest that rate has ever been (in the fourth quarter of 1973) was 10.7 percent, or slightly more than double the recent level. The average over the last 30 years has been 6.5 percent, so that it would be necessary to increase the personal saving rate to 19.5 percent in order to increase the rate of growth of the economy from 2.5 percent to 3.5 percent. If one is looking at the total rate of private saving (as a percentage of GDP), the rate in early 1995 was 16.1 percent, whereas the highest it had ever been since 1970 was 20.7 percent in 1975. We would have to increase total private saving rates to nearly 50 percent to have an appreciable impact on GDP growth rates.

This means that even if Step 4 in Figure 1 is true (and ignoring doubts about Steps 2 and 3), the size of the effect is not large enough to matter. Even if we were to get higher saving and investment from a change in the tax code, the impact on people's incomes is likely to be quite small. Looked at differently, political and economic resources would be better spent in finding ways to increase innovation and workers' skills, rather than radically altering the tax system (and the distribution of income) in pursuit of—at best—a numerically insignificant increase in growth.

*The Short Run and the Long Run*

Confronted with the notion of the Paradox of Thrift, the standard response from mainstream economists is that the paradox is, at most, a short-term phenomenon. Since the economy will move in the long run to its technically dictated "full-employment equilibrium," lower spending (that is, more saving) cannot result in lower output in the long run. This implies that what happens along any particular adjustment path cannot affect the long-term levels of investment, output, growth, and so on. The economy is assumed to be "path independent."

What would be required to make the economy impervious to contractionary fiscal policy, at least in the long run? Stated differently, how can you end up with exactly the same capital stock that you would have had despite the occasional short-term downward blip in investment? Clearly, there must be periods when investment is greater than it would otherwise be to balance out the average rate of investment over time.

If investment is responsive to swings in the economy, rather than to changes in the cost of capital—as the empirical evidence shows so strongly—this further implies that output must occasionally operate above its long-term level, at levels high enough and for periods long enough to generate sufficient excess investment. One simple way to "prove" that this is how the U.S. economy actually works is simply to define the long-term potential of the economy to be equal to its trend value over any period of recent history, so that the time pattern of GDP is constructed with half of actual output levels above trend and half below. If, and this is a very big if, investment responds symmetrically on both sides of "full employment" (thus defined), the problem is solved. Average investment is unaffected by the existence of occasional downward swings in investment.

Any non-tautological method of defining full employment, however, requires that short-term drops in investment have no permanent effects. Simply relying on the notion that the economy's long-term tendency is *toward* full employment, as contentious as that claim is, does not mean that the economy could not be moved onto a permanently lower growth path by the occasional loss of capital accumulation. In that case, the economy can be made cumulatively poorer over time by short-term deviations from full employment. (Whether this will affect the long-term growth rate, rather than the long-term level of GDP, depends on whether growth rates are path dependent. At the very least, however, it is clear that living standards can be permanently lowered through contractionary fiscal policy.)

Any realistic discussion of the time path of investment and output must, of course, look seriously at what happens to monetary policy with a proposed change in fiscal policy. Will the Federal Reserve respond to the downward trend of output and investment by easing monetary policy? As important as that subject may be, it is beyond the scope of the current discussion. The interested reader might start with



Athanasios Orphanides and David Wilcox [1996] for a suggestion that contractionary fiscal policy will not be rewarded with expansionary monetary policy.

### *Conclusions*

The desire to change the tax code is understandable. The system is currently complicated and often perverse. However, there is no need to rewrite the entire tax code in order to encourage more saving. There is no reliable evidence to indicate that current levels of saving are inadequate, nor is there any guidance available as to what the optimum amount of saving should be.

The tax system already encourages saving and investment in a number of significant ways. More importantly, though, there is no evidence that changing the tax code in supposedly saving-enhancing ways will actually raise saving. People can be very ingenious when they want to maintain their levels of consumption, and the tax code cannot prevent this.

This is actually fortunate because if a tax change did increase saving, the economy would be hurt. The decline in consumption spending would at least slow the economy down, if it did not induce an outright recession.

In short, saving-inducing tax plans are attacking a problem that does not exist, with a mechanism that will not work, in order to achieve a goal that would harm the economy. It would be much better to design tax policy to achieve other goals such as raising revenue and redistributing income. Instead, many elected officials cloak support for regressive tax changes in the rhetoric of a high-sounding theory that is known to be false. A more cynical mind might think that they know exactly what they are doing.

### *Notes*

1. Net foreign investment is a devilishly ambiguous term. It means "net purchase of foreign assets by Americans," or the net amount of money loaned to foreigners by Americans and American-owned companies.
2. Clearly, this could even result in both saving and investment falling, since businesses might reasonably choose to let their capital depreciate without replacing it (i.e., a firm might engage in net disinvestment). Thus, firms might decrease their gross amount of investment below even their earlier plans. This would make the level of saving fall still further, to match the decrease in total investment.
3. This is true even of Euler equation models derived with "time-to-build" structures included in the model.

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