TAXES, SAVING, AND WELFARE:
THEORY AND EVIDENCE

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ABSTRACT

This paper reviews theoretical analysis and results of empirical
research on the effects of taxation on private saving. The theoretical
section describes income and substitution effects, distinguishes between
compensated and uncompensated elasticities, notes that saving is
expenditure on future consumption, and discusses how the optimal
taxation of capital depends on the response of labor supply to taxation,
as well as that of saving. The review of empirical literature is
devoted primarily to an examination of recent papers by Michael Boskin
and by Philip Howrey and Saul Hymans. Determining the effect interest
rates have on saving involves considerable conceptual and econometric
difficulties and has not been accomplished satisfactorily.

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I. Introduction

Several current debates on tax policy center on how taxation affects saving and capital accumulation and on how national welfare is reduced by the use of taxes that distort the choice between current and future consumption. For example, taxation and inflation interact to produce effective tax rates on corporate-source income that greatly exceed statutory rates.[1] In part to offset the adverse effects these high rates may have on incentives to invest, proposals such as "10-5-3" and "first year capital recovery" have been offered.[2] Somewhat more radical is the proposal to convert the present income tax into a personal tax on consumption expenditures by exempting all saving from tax.[3] A value added tax (VAT) levied on the basis of consumption would also exempt saving.[4]

The case for a personal expenditure tax, a VAT, or other tax that exempts saving is often founded, at least in part, on neutrality toward the choice between saving and consumption. Whereas a tax levied at the same rate on consumption in all periods is neutral, the argument goes, the income tax, because it applies to interest income, penalizes saving and results in a loss of welfare.[5] This argument --which itself is easily stated incorrectly -- is somewhat different from the seemingly similar view that reducing the taxation of capital income would increase saving. Even if a change in tax policy would increase welfare by reducing discrimination against capital accumulation, it does not follow that its adoption would result in more saving.

The purpose of this paper is to review theoretical analysis and results of empirical research on the effects of taxation on private saving and economic welfare.[6] One basic conclusion of section II is that long-established results of theoretical analysis are often ignored or misunderstood by economists, as well as by policy-makers, and the lessons of more recent theoretical analyses of optimal taxation have been only dimly perceived. This generally inadequate conceptual state of affairs is mirrored in empirical analysis, the subject of section III, where it apears that the few serious scholars working at trying to untangle the effects of taxation on saving and welfare have not always been asking -- or even recognizing -- the "right" questions.[7] But the problems of empirical analysis go beyond those that result from failure to frame the research question carefully. Limitations posed by inadequate data and econometric difficulties make it difficult even to arrive at a satisfactory answer to the _wrong_ question.

II. Theoretical Analysis

The traditional theoretical analysis of the effects of taxation on saving and welfare can be presented heuristically, if not rigorously, with the help of a simple arithmetic example. Consider the options of someone who has an endowment of $100 to split between saving and current consumption in a two-period model in which future consumption is the only rationale for saving. (That is, there are no bequests.) If the real rate of interest is 10 percent, the person can spend the entire $100 now, can save it and consume $110 in the future, or can achieve any intermediate position by saving a fraction of the $100. Whatever the fraction of saving chosen, the cost of future consumption,

in terms of forgone present consumption, is 1/(1.10). More generally, if r is the rate of interest, the opportunity cost of future consumption is simply 1/(1+r). If the usual conditions for welfare maximization are met, the equality of the opportunity cost of present consumption to the real rate of interest, which must be assumed to represent the marginal productivity of capital, indicates that social welfare is maximized.[8]

Suppose now that an income tax of 50 percent is imposed on capital income. If the before-tax real rate of interest remains constant at 10 percent, the net real return to saving is reduced to 5 percent and the private opportunity cost of future consumption rises to 1/1.05 (or to $\frac{1}{1 + r (1-t)}$ in the more general case, where t is the marginal tax rate).[9] This increase in the private opportunity cost of future consumption will generate a tendency for our consumer to prefer present consumption relative to future consumption. But note that the tax-induced drop in the net real rate of return is tantamount to a reduction in income of the individual whose choices are under consideration. There may be a tendency to cushion the reduction in future-period consumption resulting from the tax by shifting some consumption from the present to the future.[10] The first effect identified above (the shift of consumption from the future to the present induced by the change in the reward to saving) is the so-called substitution effect of capital income taxation on future consumption and the second effect (the cushioning of the fall in second-period consumption) is the income effect. As is so often the case when these two effects occur together, they produce tendencies that run in opposite directions, and their net effect on present consumption cannot be known, a priori. Rather, empirical analysis is required to determine the net effect, as well as the two separate effects.

A. Will You Repeat the Questions?

Two things should be noted about the theoretical result just reported. First, any tax that caused the same reduction in income would have the same income effect as the tax on interest income discussed. It is thus useful to isolate the substitution effect by comparing the capital income tax with a tax that has no distortionary effect on economic decisions. Though such a tax is hardly a candidate for serious consideration for adoption, a lump sum tax is the benchmark usually employed for such comparisons. Under such a tax the private opportunity cost of future consumption would remain unchanged at $1/(1.10)$, or more generally, at $1/(1+r)$, and there is no substitution effect. Compared to this, the substitution effect described above would guarantee that the tax on capital income would unambiguously shift consumption from the future to the present.

If one is interested in the net effect of income and substitution effects combined, it is appropriate to inquire about "uncompensated" price elasticities of demand. Interest might focus on uncompensated effects if, for example, the question at issue were how higher taxes would affect saving. But even then if the focus of attention were on the comparison of several alternative tax policies that would have similar income effects, it might be most useful to concentrate on differences in substitution effects.

If one is interested in the welfare losses resulting from the distortionary effects of taxation, the situation is quite different. Since results of welfare economics are all given in terms of compensated elasticities, only substitution effects derived from structural equations based on theoretical models that describe consumer behavior are relevant. It is thus necessary to

attempt to estimate the parameters in the structural equations, abstract from income effects, and thereby calculate "compensated" price elasticities. Unfortunately this distinction between purposes of analysis and the implied empirical questions has not always been observed, even in principle.

Second, since welfare analysis yields results in terms of effects on future consumption, the discussion to this point has been deliberately couched in terms of effects on future consumption -- not effects on saving. As Feldstein (1978a and 1978c) has argued, saving is _expenditure_ on future consumption, not the _quantity_ of future consumption. The ordinary relationship between price elasticities, quantities, and expenditures makes it clear that if the elasticity of _saving_ with respect to the price of future consumption is zero, the elasticity of _future consumption_ with respect to its price must be unity. (More generally, the two price elasticities (those of saving and future consumption) with respect to the price of future consumption differ by one.)[11] This means that a finding that _saving_ does not respond to an income-compensated change in the interest rate would not indicate that a capital income tax would have no welfare effect. Quite the contrary, for a given level of saving and change in the price of future consumption, the welfare loss would be that usually associated with a unitary price elasticity of demand for the quantity of consumption (future consumption, in this case).[12]

The importance of these issues can be seen from a review of the discussion of a recent paper by Phillip Howrey and Saul Hymans on the interest elasticity of saving. Both Feldstein (1978b, p. 686-87; 688-89) and Shoven (1978, p. 690) criticized Howrey and Hymans (1978a) for overlooking the two points made in this

section.[13] First, they reminded Howrey and Hymans that saving rises in response
to a compensated fall in its price only if the compensated elasticity of demand
for future consumption exceeds unity. Implicit in this criticism is the assump-
tion that Howrey and Hymans are (or should be) concerned with the welfare impli-
cations of capital taxation. These are, as indicated above, questions of tax
effects on future consumption, and not effects on saving. Further, Feldstein
and Shoven suggest that whereas compensated elasticities are relevant for
welfare analysis, Howrey and Hymans estimated uncompensated elasticities.

Howrey and Hymans' response to these criticisms is worth noting. They
seem to deny (1978, pp. 656-57) that they were estimating uncompensated elasti-
cities. (See also Brittain, 1980, p. 42.) But the fact that this absolutely
crucial point was initially made only in a footnote to their paper, does not
figure in their published response to Feldstein's and Shoven's comments, and
received no further elaboration when presented at a conference that occurred
subsequent to these comments suggests that Howrey and Hymans may have failed to
understand the importance of the issue. Nor is their retort totally satisfac-
tory when they write (1978, p. 703):

> Finally, Feldstein -- like Shoven -- misses an
> important point by discussing a problem in which he is
> interested, rather than the problem that we addressed. We
> stated that a policymaker interested in increasing the
> funds available for capital formation would be unlikely to
> manipulate the tax rate on interest income unless the
> after-tax rate of return could be shown to have a substan-
> tial and reliably measured effect on saving. Our analysis
> casts serious doubt on the proposition that loanable-funds
> saving responds to the rate of return to saving ... If
> Feldstein wishes to argue that other goals (such as increased
> welfare or economic efficiency) justify tax substitution,
> he is certainly free to do so. What we claim is that the
> argument for tax substitution cannot be justified by the
> proposition that it will change the supply of funds available
> for capital formation.

Their rejection of economic efficiency, the analysis of which requires compensated elasticities, as a goal does not necessarily indicate inconsistency between their objective and their estimating procedure; other goals could justify compensated elasticities. But their concentration (1978, p. 655) on "saving as the supply side in the process of capital accumulation" could be interpreted as being more consistent with estimation of an <u>uncompensated</u> elasticity. Admittedly they explain in a footnote (1978, pp. 656-57) why they concentrate on the compensated elasticity.[14] But the discussion of the tendencies of income and substitution effects to be offsetting that immediately follows that footnote -- which would be an irrelevant aside if one accepted the argument of the footnote -- suggests that the footnote and its justification of estimating a compensated elasticity may have been an afterthought. All things considered, one is not confident that Howrey and Hymans had decided before beginning work that the question at hand required estimation of a compensated elasticity.

B. Optimal Tax Theory

Implicit in the analysis to this point is the assumption that it makes sense to appraise a capital income tax by comparing it with a lump sum tax and calculating the welfare loss caused by the intertemporal misallocation of consumption induced by the tax on income from capital. But lump sum taxes are not realistic alternatives and any real-world tax, such as a tax on labor income, also involves welfare losses. Taxes on labor income can generally distort choices between labor and leisure, between market and non-market activities, between working and retirement, between investing optimally in human capital and under-investing, etc. A more relevant analysis is therefore one that attempts

to choose the combination of taxes on labor and capital income that minimizes

the combined welfare loss induced by the two taxes, for a given revenue yield.

Such an analysis of "optimal taxation" indicates both (a) just how special are

the conditions under which the traditional analysis outlined above is appropriate

and (b) further lacunae in the empirical knowledge necessary for informed tax

policy.

Models employed to examine optimal taxation of labor and capital commonly

supplement the simple two period model described above by specifying that the

income available to finance consumption in the two periods is derived from labor

supplied in the first period (the stylized working life). Whereas the indivi-

dual must decide how much to work during that period, based on the net wage

rate, retirement is complete during the second period. In this analysis there

are three "goods:" leisure, present consumption, and future consumption. The

difficulty for tax policy results from the impossibility of taxing leisure.

Absent that constraint, an optimal tax would be one levied at the same ad

valorem rate on leisure and on consumption in the two periods.

Results in this more complex world are more complicated than in the model

in which tax-induced distortions of labor supply could be ignored, and they

therefore do not lend themselves as readily to numerical examples and intuitive

interpretation as do those in the simple world of fixed endowments and inelastic

labor supply. But the common result is that the optimal tax structure depends

crucially on the (income-compensated) cross-elasticities between leisure and

consumption in the two periods, as well as on the (income-compensated) own

elasticities of demand for leisure and consumption with respect to their

prices.[15]

This result indicates that a tax on capital income may have (positive or negative) welfare effects, even if the demand for future consumption has a zero compensated elasticity of demand and that a tax on labor income -- which is equivalent to a tax on consumption -- is optimal only under quite special circumstances. In general, the expenditure tax is optimal only if it results in equal percentage reductions in leisure and consumption in the two periods. This "Ramsey" result occurs if the (compensated) elasticities of demand for the three goods with respect to the wage rate are equal; see King (1980).[16] More generally it is optimal to levy the higher rate of tax on the consumption that is the weaker substitute for leisure, since the latter is untaxed.[17] Optimal tax theory clearly has important implications for empirical research, for it implies that the optimal taxation of capital and labor income cannot be settled merely by evidence on the interest elasticity of saving (or, more accurately, future consumption). Rather, evidence is also required on the elasticity of supply of labor and on the cross-elasticities mentioned earlier. Having made this point, I will not dwell on it, except to note that there is, as yet, little satisfactory literature on the cross elasticities of demand between leisure and consumption in various periods. Empirical evidence on the elasticity of supply of labor is reviewed in Hausman (1979) and Rosen (1979).

C. A Further Complication

To this point we have considered only the problem of distortions in the individual allocation of consumption between present and future periods, assuming that the private and social rates of time preference are equal. But if these rates diverge, for example, because of considerations of intergeneration equity, public policy may also be concerned with the equilibrium level of capital per manhour. Thus King (1980) distinguishes between (a) policies that

avoid distortions in the intertemporal allocation of consumption, on the assumption

that other public policies are available to place the economy on the "golden

rule" growth path on which the marginal product of capital equals the growth

rate and (b) the policies that are necessary to achieve the "golden rule" path.

He notes:

> If the government has no policy instruments other than
> the two tax rates then in general it will be unable to
> achieve the golden rule condition, and the optimal tax
> rates will reflect the trade-off between not only the con-
> ventional efficiency losses but also between these and the
> losses resulting from the failure to achieve the dynamic
> optimality condition ... [T]he optimal tax rate on capital
> income is very sensitive to this second factor. This is
> rather disturbing because it alerts us to the possibility
> that our conclusions are sensitive to the assumptions we
> make about policy instruments which are excluded from the
> model. For example, if the government could use debt
> policy to determine the rate of interest in the economy, it
> could attain the golden rule and the optimal tax rates
> would be independent of dynamic considerations. Clearly,
> the welfare implications of particular tax changes (such as
> the replacement of the income tax by a consumption tax)
> depend upon the constraints which are, or are not, assumed
> to restrict the use of other policy instruments. Although
> this is a standard "second-best" argument, it is very
> important to note that one of the principal sources of
> disagreement over the potential welfare gains from tax
> reform is not differing assumptions about the behavioural
> responses to taxes, but the assumptions (often implicit)
> made about other policy instruments.

In what follows no further reference is made to this distinction. But in prin-

ciple it should be kept in mind in appraising the policy implications of the

empirical results reported below.

III. The Evidence

Perhaps the two most widely discussed recent attempts to determine the

effects of taxation on saving are those by Boskin (1978a) and by Howrey and

Hymans (1978a and 1980).[18]   Boskin has found an interest elasticity of saving of

about 0.2 to 0.4; he seems to prefer estimates on the high side of that range.
Howrey and Hymans, on the other hand, have found no strong relationship between
the interest rate and the rate of saving and have seriously questioned the tech-
niques employed by Boskin in obtaining his estimates. Moreover, whereas Boskin
(1978a, p. 519) describes his estimates as uncompensated elasticities, Howrey
and Hyman (1978, pp. 656-57) assert that theirs are compensated. Given the
inherent differences in compensated and uncompensated elasticities resulting from the
exclusion and inclusion of income effects, these two sets of results diverge even more
than first appearances suggest. Both analyses, but especially that of Howrey and Hymans
have been subjected to examination at two conferences at the Brookings Institution. Thi
section reviews the two sets of estimates and the problems raised by various discussants

A. The Boskin Estimates

Boskin (1978a) presents estimates of consumption functions based on time-
series data from 1929 to 1969 in which real per capita private consumption is
regressed on current and lagged disposable private income, wealth, the
unemployment rate, and the real after-tax return on capital.[19] In his "basic"
equation the implied interest elasticity of saving is reported to be approxima-
tely one-fourth.[20] In additional estimates Boskin sequentially adds an
expected rate of inflation, employs only the postwar period, enters the real
net rate of return in logarithmic form, and employs an instrumental variable
approach in an attempt to avoid single equation bias. In all cases the point
estimates of the interest elasticity of saving lie between 0.2 and 0.4, leading
Boskin to conclude that his estimates are robust. Based on an estimate for this
elasticity of 0.4 Boskin calculates an estimated annual welfare loss resulting

from capital taxation of close to $60 billion. He qualifies this estimate,
however, by noting a) that it is a lower bound, since his estimate of the uncom-
pensated saving elasticity understates the pure substitution elasticity, but b)
that the estimates of welfare loss must be adjusted downward once account is
taken of the distortions involved in labor taxation and the cross elasticities
mentioned in section IIB.

Before presenting the results of their own analysis Howrey and Hymans
(1978a) subject that of Boskin (1978a) to extensive criticism. They experiment
by dropping 1934, by lagging the unemployment rate two years, and by employing
alternative interest rates in Boskin's regressions. Because of the sensitivity
of Boskin's results to those tests they express doubt about the reliability of
his estimates. In addition, Howrey and Hymans, being dissatisfied with Boskin's
specification of his model and his definition of saving, translate Boskin's con-
sumption equation (and implicit saving equation) into an explicit saving
equation and employ several alternative definitions of saving (to be described
below). None of these works really well and Howrey and Hymans conclude (1978a,
p. 674) that "it seems that no personal saving rate -- whether cash or some
other form --responds to variations in the real after-tax rate of return."

In his reply to Howrey and Hymans' comments on his own work Boskin (1978b
and 1980) makes several points: that because of single equation bias it is
necessary to use an instrumental variable technique; that the lack of statisti-
cal significance of the rate of return coefficient derived from the reestimation
of his equations does little to cast doubt on his estimates, since it is always
possible to reduce statistical significance by dropping or lagging observations,
changing the sample period, etc., especially if the number of observations or
variability in right-hand variables is thereby reduced.

Boskin's viewpoint has been seconded by Brittain, who concludes (1980, p. 45) that "the evidence against Boskin's concept of positive elasticity is only moderately persuasive." Testing regressions by adding variables and dropping observations does sacrifice degrees of freedom and make it difficult to obtain statistical significance. And it does appear that Howrey and Hymans' decision to lag the unemployment rate two years may have been based more on its effect in reducing t values, than on economic reasoning. Even so, Brittain admits (1980, p. 46) that "despite these reservations, it is fair to say that in the total of their work Howrey and Hymans have cast doubt on Boskin's elasticity estimate."

B. The Howrey-Hymans Estimate

In their own attempts to determine the interest elasticity of saving, Howrey and Hymans consider three alternative measures of aggregate saving: saving in the national income and product accounts (NIPA), saving in the flow of funds accounts (FF), and what they call personal cash saving. They argue that neither of the first two of these is germane to the issue at hand, which they take to be "loanable funds" saving available to finance business capital formation. Both concepts include imputation of investment in owner-occupied buildings (net of capital consumption allowances). The first also includes changes in reserves of private pension and insurance plans, the latter net investment in consumer durables. By deducting those items from the two definitions of saving, Howrey and Hymans arrive at an estimate of personal cash saving, upon which their analysis concentrates.

Howrey and Hymans regress annual saving (defined in various ways) on
lagged saving, changes in various components of income, the change in a real
rate of return, the change in the rate of inflation, the change in the standard
deviation of the rate of inflation, the change in business cash saving, and
changes in government cash saving. The last two right hand variables are
included to test the "ultrarationality" proposition that households view busi-
ness and government saving as a component of their income and as a substitute
for personal saving.[21] The Baa corporate bond rate, net of their estimate of
the marginal federal tax rate applicable to capital income, was reduced by a
rate of expected inflation obtained from survey data to produce an estimate of
the expected net real rate of return.[22] Howrey and Hymans conclude that it is
unlikely that the interest rate has any effect on saving. In addition, they
find support for the ultrarationality hypothesis, especially so far as business
saving is concerned.

Howrey and Hymans' work has been strongly criticized. First, as Feldstein
(1978b) has noted, the expected real net rate of return is not observable. It
can only be surmised and approximated empirically by subtracting estimates of
the expected inflation rate from the appropriate net of tax interest rate.
There are thus at least three places where analysis can go astray: in choosing
the appropriate interest rate (or rates), in estimating the expected inflation
rate, and in determining the relevant marginal tax rate. Success would be dif-
ficult enough for a nation of identical households all living in the same state,
receiving the same income, and paying the same state and federal income taxes.
But when aggregate data are employed it is necessary to choose some central

estimate of the relevant tax rate, interest rate, and expected inflation rate.
Feldstein (1978b) and Boskin (1978b, p. 698) note, for example, that the survey
data employed by Howrey and Hymans contain information on short-run expectations
of inflation, but contend that long-run expectations may be more relevant for
the purpose at hand. (See also King, 1980.) On the other hand, Shoven (1978,
p. 692) argues that the choice between actual and expected interest rates
depends on the time-horizon of savers. Feldstein has emphasized that the
substantial measurement error resulting from these problems biases the estimate
of the coefficient on the expected net real rate of return (toward zero, if the
error happened to be random). The small sample size, minimal variation in the
expected real net rate of return, and measurement problems mean that there is a
high ratio of noise to information and that it may be difficult to obtain
meaningful parameter estimates, especially if techniques that require large
sample size are necessary. As several observers have noted, it may be necessary
to utilize micro-data collected from households to isolate the interest elasti-
city of saving. (See Lawrence, 1980, p. 33.) This might allow adequate treat-
ment of demographic and life cycle considerations, a potentially important fac-
tor in explaining changes in saving over time that Shoven (1978, p. 692) notes
are sorely missing from the Howrey-Hymans analysis.[23]

Not all would agree that "loanable funds" saving is the proper focus of
attention, arguing that saving of business firms is also relevant for the issue
at hand. After all, personal cash saving is less than 15 percent of NIPA gross
saving.[24] Feldstein (1978b, p. 688) has characterized the specification of
saving behavior employed by Howrey and Hymans as "basically a mistake." In
direct contradiction to Howrey and Hymans' view that "loanable funds" saving is
the appropriate dependent variable, Feldstein argues that a broader concept,

such as net worth, should be the focus of analysis. Even if one grants the
hypothesis that personal cash saving is conditioned by other forms of saving,
Feldstein faults the proxies employed for those other forms of wealth: gross
business saving, rather than net; contributions to social security, rather than
social security wealth; the government surplus (an endogenous variable), rather
than the change in the real government debt. Brittain (1980, p. 44) and King
(1980) have also questioned the exclusion of the reserves of pension companies
from the definition of personal cash saving. The exclusion appears to be based
on the view that these reserves should be treated as part of the net cash flow
of the business sector, and therefore not part of the personal saving of indivi-
duals that is the object of attention. (Howrey and Hymans, 1978a, p. 658) But
this argument is not totally persuasive.

In related comments Shoven (1978, p. 691, 693) and King (1980), as well as
Boskin (1978b, p. 644) have faulted the use of a single equation technique to
estimate rate of return effects on personal cash saving. Even if the
forms of saving that are excluded from personal cash saving are not what people
concerned with capital formation have in mind, a complete model of consumer
behavior would include stocks and accumulations of these items. Beyond that,
implicit in the Howrey-Hymans single equation test of the ultrarationality
hypothesis is the view that business saving can be treated as predetermined in
the equation for personal cash saving. More appropriate tests may indicate that
this view does not do great violence to reality. But strictly speaking business
saving and personal saving are determined simultaneously. More generally, by
using a single equation model Howrey and Hymans cannot hope to distinguish bet-
ween effects of interest rates on saving and effects on investment.

C. Conclusion

For those who are interested in the "bottom line" this discussion of the empirical estimates and problems of Boskin and of Howrey and Hymans has probably been overly long. For them a simple cliche such as "more smoke than fire" or "the jury is still out" might have sufficed quite well. But following that approach might do a disservice, for it would tend to obscure one of the central propositions of this paper: determining the effect interest rates have on saving is no mean trick. It involves considerable conceptual and econometric difficulties that still defy the best efforts of bright and dedicated economists.

IV. Concluding Remarks

In reviewing the program for this symposium I see the following description:

> The papers in this session will address the potential of these alternative tax and fiscal strategies for increasing the rate of saving and private capital formation, and for enhancing productivity. The approach in each paper will be to examine the theory and the evidence regarding the responsiveness of saving and capital formation to the price and income effects of alternative tax and fiscal structures.

Based on the brief review of theoretical analysis and empirical results presented here one must be a bit pessimistic. First, economists have not always been clear whether it is tax effects on future consumption or on saving that interest them. And far from achieving success in isolating income and substitution effects, they seem not to have always been clear whether they want to isolate them, by calculating compensated elasticities of demand, rather than com-

bining them in estimates of uncompensated elasticities. Beyond that, to formulate optimal tax policy one must know own and cross-elasticities of demand for leisure, as well as for future consumption. Finally, even if these formidable problems are not present, econometric difficulties plague estimates of the "saving" response to interest rates.

Having said all this, it is, however, well to keep it in perspective. After all, the empirical debate between Boskin and Howrey and Hymans is over the interest elasticity of saving. As Feldstein (1978a) and King (1980) have emphasized, even if Howrey and Hymans were correct, the elasticity of demand for future consumption would be unity and the welfare loss from capital taxation could be large. Beyond that, it is easy to overemphasize neutrality toward saving as an argument for a VAT or a personal expenditure tax. Equity and neutrality toward different types of investment are also important. The personal expenditure tax, in particular, has such advantages, especially in an inflationary environment, that are unrelated to intertemporal neutrality. (See Kay and King, 1978; the Meade Committee, 1978; Bradford, 1980b; and King, 1980).

Footnotes

* The author is vice president of the National Bureau of Economic Research. The opinions reported here are solely his own, and not those of the National Bureau of Economic Research.

[1]See Feldstein and Summers (1979). That effective rates exceed statutory rates is not inevitable; it depends upon the particular set of tax rules that govern the definition of taxable income.

[2]A bill introduced by Barber Conable and James Jones would provide depreciation of structures in ten years, equipment in five years, and autos and light trucks in three years. For an analysis of "10-5-3," see Feldstein (1979). Auerbach and Jorgenson (1980) contains the imaginative proposal for allowing firms deductions in the year investment occurs for the present value of all future depreciation allowances.

[3]See Andrews (1974), Mieszkowski (1977), U.S. Treasury Department (1977), Bradford (1980a,b), and other papers in Pechman (1980).

[4]For an analysis of the value added tax contained in the "Tax Restructuring Act of 1979," see McLure (1980).

[5]At this point no distinction is made between a) neutrality between saving and consumption and b) neutrality between present and future consumption. This figures crucially in the discussion of section II.

[6]Compared to the mandate of the symposium program (reproduced in the concluding section), the discussion presented here is limited in at least two important

ways. First, effects on net private saving are considered. No attempt is made to determine whether or not technological progress is embodied in new capital goods, how taxes affect gross saving, etc. Second, the focus is upon attempts to untangle aggregate income and substitution effects of tax changes on saving. But more important may be the differential income effects on saving that result when tax burdens are shifted between income groups, depending on marginal pro-pensities to save at different income levels. Moreover, effects of tax policy that work through the budgetary balance and differences in public and private propensities to save are not treated.

[7]It is always dangerous to make an assertion such as this, for it opens one to criticisms such as that by Howrey and Hymans (1978b, p. 703) that "Feldstein -- like Shoven -- misses an important point by discussing a problem in which he is interested, rather than the problem that we addressed." Nonetheless, it does seem as though many persons who have been involved in the debate on the effects of taxation on saving have not always stated clearly and explicitly why they are interested in the problem. One primary contention of this paper is that failure to answer this question carefully can result in improper or irrelevant analysis.

[8]This ignores the social choice of the optimal equilibrium level of the capital-labor ratio based on considerations of intergenerational equity; see King (1980) and part B of this section. Moreover, this entire discussion ignores complications that result once analysis covers more than two periods.

[9]Thus the social opportunity cost of future consumption is $1/(1.10)$ while the private value of future consumption is $1/(1.05)$. Throughout this discussion it

will be convenient to assume that the marginal technological possibilities of transforming present consumption into future consumption remain constant so that the marginal social opportunity cost of future consumption in terms of present consumption (the inverse of 1 + r) is constant. In general, however, it is the discrepancy between the gross and net real rates of return, rather than the constancy of the latter, that is important for determining whether or not a welfare loss occurs. For more rigorous discussions of the theoretical propositions presented here, see, for example, Musgrave (1959), Musgrave and Musgrave (1976), or almost any textbook on microeconomic theory. For an empirical argument along these lines that the national rate of saving is too low, see Feldstein (1977). Feldstein explicitly rejects the following spurious arguments for increasing the rate of saving: that there is a "capital gap" (in the sense that the demand for investment funds exceeds the supply), that full employment cannot be maintained because the capital stock is too small, that a greater rate of capital formation would facilitate achievement of price stability, and that a larger capital stock would make American labor more productive and improve the balance of payments.

[10]Note that there is no assumption that second period consumption is an inferior good. Rather this shifting of consumption from the first period to the second occurs because as the problem is structured all the drop in income initially occurs in the second period.

[11]These two elasticities differ by exactly one only in the special case in which there is no non-capital income in the second period of a two period model.

[12]For further discussion of the quantification of welfare losses induced by taxation, see Harberger (1964). For the application of the analysis to the problem at hand, see Feldstein (1978a).

[13]The paper by Howrey and Hymans appears in both (1978a and 1980). Similarly, Boskin's comments on that analysis (1978b and 1980) is reproduced in both places. Subsequent references to Howrey and Hymans' work and to Boskin's critique are to the earlier versions.

[14]One hardly knows what to make of the remark (Howrey and Hymans, 1978a, p. 657) that "This procedure is not the same as the one implied in the usual conceptual experiment of isolating the income and substitution effects of a change in the after-tax interest rate." One person at the Washington symposium suggested to the author that inclusion of income among the right-hand variables would imply isolation of the substitution effect. But consideration of the two period theoretical model suggests that it is _future_ income or wealth that must be included if the analyst is to abstract from income effects of changes in interest rates. More generally, one must know the present value of the income stream and how it is distributed through time.

[15]See Feldstein (1978a) and Bradford (1980c). For an excellent discussion of this proposition and additional references to the literature, see King (1980). Sandmo (1976) provides an excellent introduction to the literature; it does not, however, explicitly cover the analytical issue at hand.

[16]King notes (1980) that Feldstein (1978a) inadvertently chose parameter values for his illustrative example of the welfare loss of capital income taxation that

would imply that an expenditure tax is optimal. For other parameter values the expenditure tax would not be optimal and, indeed, a capital subsidy might even be required.

[17]This result is, of course, a close cousin to the result of Corlett and Hague (1953) that if leisure cannot be taxed the second-best approach is to tax goods that are complementary to leisure.

[18]Earlier work in this field is reviewed by Boskin (1978a) and by Howrey and Hymans (1978a). It seems sufficiently deficient to justify concentration on the subsequent work by Boskin and by Howrey and Hymans.

[19]The dependent variable and the first three right-hand variables appear in logarithmic form. Though Boskin does not say so, the income and wealth variables are also apparently in per capita terms.

[20]Since Boskin subsequently (1978b, p.694) contends that "one of the major points of my JPE paper was that it was not reasonable to estimate consumption functions by single-equation methods," it is not clear in what sense he considers this equation "basic."

[21]See David and Scadding (1974) for a widely noted reference to this proposition, which Boskin (1978a) also discusses at some length.

[22]Shoven notes (1978, p. 693) that Howrey and Hymans use the _actual_ Baa bond rate, rather than the _expected_ rate. Interestingly this rate seems to have been chosen because it performed best in the Boskin equations that Howrey and Hymans reject (1978a, p. 673).

[23]Boskin and Lau (1979) have attempted, on the other hand, to integrate economic and demographic effects in the estimation of labor supply and saving responses simultaneously from aggregate time series data.

[24]Brittain has argued, however (1980, p. 44), that this fact actually reinforces Howrey and Hymans' conclusion: personal cash saving may simply be so small that it serves no purpose to aim tax policy at it.

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