NBER WORKING PAPER SERIES

ISSUES IN THE MEASUREMENT AND DETERMINANTS OF BUSINESS SAVING

Alan J. Auerbach

Working Paper No. 1024

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge MA 02138

November 1982

This paper was presented at the Conference on U.S. Policy Affecting Saving sponsored by the Federal Reserve Bank of Boston, October 6-8, 1982. I am grateful to Martin Baily, Robert Eisner, and various colleagues and friends for helpful comments and suggestions. The research reported here is part of the NBER's research program in Taxation. Any opinions expressed are those of the author and not those of the National Bureau of Economic Research.

NBER Working Paper #1024
November 1982

Issues in the Measurement and Determinants of Business Saving

Abstract

This paper begins with a discussion of the measurement of business saving, with the conclusion that even "corrected" measures of business saving are quite inaccurate in the presence of inflation, leading to an overstatement of the recent decline in business saving. The remainder of the paper focuses on the more fundamental issue of why it should matter who saves. Beginning from the irrelevance proposition associated with the Modigliani-Miller theorem, we consider the channels through which taxation causes the identity of the saver to have real effects. Finally, we consider the relative efficiency of business versus personal savings incentives, in light of our results.

Alan J. Auerbach
Department of Economics
Harvard University
Cambridge, MA 02138
(617) 495-3934

I Introduction

In 1981, personal saving in the U.S. was 106.6 billion dollars, or 4.4 percent of personal income.[1] Net corporate saving, as defined by undistributed profits net of estimated economic depreciation, was 49.5 billion dollars, or 44.0 percent of after-tax corporate profits.[2] Thus, net private saving was just 6.0 percent of net national product, which was 2.6 trillion dollars. This level of savings is low by historical standards even in the U.S., where savings as a fraction of income has always been low compared to most other industrialized countries. Moreover, it also appears to represent a shift in the composition of private savings, from the business to the personal sector. These trends are shown in Table 1. Total private saving was between 8 and 10 percent of NNP for most of the 1960s, and business savings represents almost half this total. Total private saving shrunk in the 1970s, especially in the last few years, but business saving has fallen even more. This low rate of saving in the U.S., particularly by corporations, provided much of the impetus for the inclusion of several of the "supply side" components in the Economic Recovery Tax Act, notably the acceleration of depreciation allowances, the reduction in the top marginal tax rate on personal "unearned" income, expanded Individual Retirement Accounts, All-Savers' certificates and the reduction in estate taxes. That these provisions, each of which is targeted at individuals with well above the median family income, were generally supported by members of both parties indicates how strongly Congress feels about increased capital formation as a policy goal.

This paper has several objectives. We begin with a discussion of business saving, what it is and what influences it. A key point to be made here concerns the proper definition of such saving. Next, we ask the more

Table 1
Saving In The U.S., 1962-1981
(percent of NNP)

	(1) Private Saving	(2) Undistributed Corporate Profits	(3) (2) / (1)
1962	8.0	3.5	.44
1963	7.7	3.7	.48
1964	9.2	4.1	.45
1965	10.0	4.7	.47
1966	9.8	4.6	.47
1967	10.0	4.0	.40
1968	8.7	3.5	.40
1969	7.4	2.7	.36
1970	7.8	1.6	.21
1971	8.5	2.3	.27
1972	7.7	2.8	.36
1973	9.2	2.7	.29
1974	7.6	1.0	.13
1975	8.9	2.1	.24
1976	7.7	2.4	.31
1977	7.3	3.0	.41
1978	6.9	3.0	.43
1979	6.7	2.7	.40
1980	6.2	1.9	.30
1981	6.0	1.9	.32

Source: Economic Report of the President 1982, Tables B-19, B-23 and B-82.

fundamental question whether it matters what business saving is, as distinct from a broader savings measure. Since corporations are, ultimately, owned by individuals, there would appear to be little importance to the identity of the saver. However, analysts have traditionally looked at business saving as at least partially independent from household behavior. While such an approach may rest on assumptions about the separation of ownership and control of corporations, or the inability of stockholders to "pierce the corporate veil," it may also be explained by the structure of the income tax.

The U.S. corporation income tax, small though it may now be as a revenue source, is still a "classical" corporate income tax in that corporations and their stockholders are taxed independently. This lack of full integration of the personal and corporate taxes introduces differences in the incentives to save faced by businesses and individuals. Thus, the saver's identity regains importance, even if no other cause for distinction exists. We review recent theoretical and empirical evidence on this question to help in analyzing the likely impact of savings and investment incentives at the personal and business levels.

Given that the level at which an investment incentive is administered matters, there is a further distinction to be drawn among different strategies of delivering the incentive. In particular, there are two general types of business investment incentive. One (such as an acceleration of depreciation allowances) applies only (in principle) to new investment. The other (such as a corporate rate cut) applies to all corporate income, regardless of source. This distinction can be extremely important in determining both how effective the incentives are in spurring more investment and who gains and loses from the change in policy. After reviewing the theoretical differences between the

two types of incentives, we present results from a dynamic, perfect-foresight simulation model to illustrate them. Finally, we discuss the implications of our results concerning both the current and recent changes in the corporation income tax and the various alternatives that might be considered.

II. Determinants of Corporate Saving

Why is U.S. corporate saving so low? In Table 2, we present (in columns (1) and (2)) two measures of deflated after-tax profits of nonfinancial corporations for the period 1962-1981, and (in column (5)) the corresponding levels of dividends. The ratio of dividends to each profit measure is presented in Table 3. The first after-tax profit measure is accounting profits. This measure has grown over the last two decades at an annual rate of 3.4 percent, though the growth has not been continuous. Moreover, dividends as a fraction of such profits have declined in the 1970s, indicating a greater percentage of business saving out of the growing profits. There can certainly be no explanation of a decline in business saving from such statistics.

However, the savings figures quoted in Section I referred to the second profits measure, which corrects profits for the miscalculation of depreciation and inventory profits. The capital consumption adjustment accounts for the fact that accounting depreciation is more accelerated than economic depreciation, on the one hand, but not indexed to price level changes, on the other. Together, these factors may lead to either an overstatement or understatement of profits. The inventory valuation adjustment accounts for the fact that firms using the first-in, first-out accounting method record fictitious inventory profits when there is inflation. Together, the IVA and CCA may either increase or decrease the profit measure, depending on the inflation rate. When inflation is low, as in the early 1960s, the first part of the capital consumption adjustment, for the acceleration of accounting depreciation over economic depreciation, dominates the correction, increasing the profits measure. When inflation is high, the correction leads to a reduction in measured profits. This is quite evident throughout the 1970s up to the present.

Table 2
Corporate Profits and Distributions, 1962-1981
U.S. Nonfinancial Corporations
(1972 Dollars)

	(1)	(2)	(3)	(4)	
	Profits After Tax	Profits After Tax w/ CCA & IVA	Inflation Gain on Net Debt	(2)+(3)	Dividends
1962	33.3	35.3	3.5	38.8	16.1
1963	36.5	39.7	2.8	42.5	17.6
1964	43.2	46.4	2.7	49.1	18.8
1965	51.1	54.5	5.2	59.7	21.1
1966	53.2	55.6	8.7	64.3	22.0
1967	48.9	52.0	8.2	60.2	22.2
1968	48.0	48.3	13.7	62.0	23.2
1969	41.8	39.6	17.1	56.7	22.1
1970	32.6	28.1	16.6	44.7	20.0
1971	37.1	33.7	16.3	50.0	19.2
1972	43.0	29.9	15.6	45.5	20.2
1973	53.0	36.6	27.8	64.4	20.0
1974	55.1	18.9	42.7	61.6	18.7
1975	52.5	35.5	32.0	67.5	20.5
1976	62.2	41.3	19.6	60.9	22.7
1977	69.1	49.9	28.1	78.0	22.8
1978	74.1	50.0	40.4	90.4	25.1
1979	75.0	40.2	40.8	81.0	24.4
1980	66.2	32.6	51.9	84.5	25.7
1981	63.1	42.1	45.9	88.0	27.1

Sources: Federal Reserve Flow of Funds Data, as obtained from the Data Resources Model Data Bank. Deflation by GNP deflator. Inflation gain on net debt equals debt less financial assets, deflated, multipied by percent change in GNP deflator.

Table 3
Payout Ratios
Dividend ÷ Profits After Tax

Profits Definition:

	(1) Profits After Tax	(2) Profits After Tax w/ CCA & IVA	(3) Profits After Tax w/ CCA, IVA and Net Inflation Gain
1962	.48	.46	.41
1963	.48	.44	.41
1964	.44	.41	.38
1965	.41	.39	.35
1966	.41	.40	.34
1967	.45	.43	.37
1968	.48	.48	.37
1969	.52	.55	.39
1970	.61	.71	.45
1971	.52	.57	.38
1972	.47	.68	.44
1973	.38	.55	.31
1974	.34	.99	.30
1975	.39	.58	.30
1976	.36	.55	.37
1977	.33	.46	.29
1978	.34	.50	.28
1979	.33	.61	.30
1980	.36	.73	.28
1981	.43	.64	.31

Sources: See Table 2

Corrected corporate profits have been essentially flat in real terms during the last twenty years. Moreover, dividends, as a fraction of such profits, have grown to the point where corporations have, over the past three years, distributed two-thirds of their corrected earnings. Together, these trends explain the low level of retained earnings. However, though retained earnings is the measure of net business saving commonly used, it does not include a component of business saving that has become very important in recent years: the inflation gain on nominal indebtedness.

At the end of the first half of 1982, U.S. nonfinancial corporations had 1.32 trillion dollars of outstanding debt, and 203 billion dollars in financial assets.[3] Since nonfinancial corporations are net debtors, they realize a gain when inflation erodes the real value of nominally denominated assets. This component of real profits, which is not taxed, is shown in column (3) in Table 2. From a very small figure relative to the standard profits measure, this gain has grown to the extent that it exceeded corrected after-tax profits during each of the last three years. Including this extra gain with profits yields a series that has grown even more rapidly than unadjusted profits since 1962, and of which dividends have been a declining fraction.

Evidence that this expanded profits measure may actually be relevant to corporate saving and dividend decisions comes from the regression results presented in Table 4. Here, we estimate a simple, partial adjustment model to explain dividends of nonfinancial corporations, following the basic specification of Lintner (1956), Brittain (1966) and others. The two measures of after-tax profits, plus the inflation gain on nominal indebtedness, are all included as explanatory variables of target dividends D_t^* in the model

Table 4

Models of Nonfinancial Corporate Dividend Behavior
(Quarterly, 1953:II to 1982:I)

Dependent Variable: Dividends (D)

	Model	
Independent Variable:	(4.1)	(4.2)
Intercept	1.83 (3.24)	1.56 (3.00)
Dividends (lagged)	.80 (16.56)	.80 (16.75)
Profits (Adjusted, After Tax)	.06 (3.79)	.05 (3.98)
Profits (Not Adjusted, After Tax)	-.02 (-1.21)	--
Inflation Gain on Debt	.04 (3.04)	.03 (3.30)
$\bar{R}^2$	.95	.95
Durbin-Watson Statistic	2.48	2.47

Source: See Table 2

$$D_t = \lambda(D_t^* - D_{t-1}) \quad (1)$$

The unadjusted profits figure is insignificant, and the coefficient of the inflation gain is significant and approximately two-thirds the size of the coefficient on adjusted profits. This suggests that corporate savings may appear lower only because corporations distribute dividends out of a broader measure of earnings than the one commonly examined by investigators.

It is important to remember that this addition to corporate savings does not raise the overall private savings measure, since measured household saving does not account for the loss on net financial assets households suffer due to inflation. Moreover, there are many other ways in which corporate profits could be corrected. One would also like to account for capital gains and losses on long term debt caused by interest rate changes, for example. However, perhaps the most important omission is the loss on the asset value of future depreciation allowances. Just as financial assets lose value with inflation, so do the "depreciation assets" which equal the stream of depreciation allowances attached to a company's assets (Auerbach 1979a). The exact value these assets held by nonfinancial corporations is difficult to calculate exactly, but a rough estimate is easily obtained. Assuming an average of N dollars per year in gross investment, depreciated at double-declining balance based on a tax lifetime equal to T, a nominal discount rate of r, an inflation rate of π and a corporate tax rate τ, we obtain the following expression[4] for the annual inflation loss on the present value of future depreciation allowances.

$$L = \tau\pi N\left(\frac{2/T}{r+2/T}\right)/(\pi+2/T) \quad (2)$$

For realistic pre-1981 values, (τ=.46, π=.06, N=125 billion, r=.12 and T=15) for example, this figure is 9.4 billion dollars, which is nearly of same order

of magnitude as the inflation induced gains on nominal indebtedness in column (3) of Table 2. Thus, the puzzle of corporate saving may not be completely solved after all. However, it seems clear that the apparently drastic decline in the corporate retention rate is an artifact of the mismeasurement of corporate profits.

III. Why Should It Matter Who Saves?

The Modigliani-Miller Theorem challenged a number of cherished views about the ability of corporations to influence their market valuation through changes in financial policy. Modigliani and Miller (1958) showed that it was of no real consequence whether corporations financed with debt or equity, and Miller and Modigliani (1961) demonstrated a similar proposition concerning the indifference between retentions and new share issuance. Both of these results, of course, hinge critically on the absence of taxes and market imperfections. What they imply is that business saving, defined as retained earnings, is a concept of meaningless distinction that has no real relevance for analysis of economic activity. If a firm chooses to pay an extra dollar in dividends, it can replace this reduction in retentions with a dollar of debt or new share issues. In either case, the household investor who receives the dividend can purchase the new security, with the end result that there will be no real change in the position of the stockholder or the firm. However, business saving will have been reduced by a dollar, and personal saving increased by the same amount. Therefore, the breakdown of private saving between personal and business sectors depends on the convention of dividend distribution, but is of no importance. One could increase business saving by inducing reductions in dividends, but this would only induce compensating responses in other financial variables.

This irrelevance result is not consistent with the view that firms can influence the welfare of their stockholders through strictly financial transactions. It also suggests that there is no reason for concern about business saving, rather than private savings.[5] Yet the traditional view has been that there are separate incentives governing the behavior of households and

corporations, just as the tax system (in the U.S.) treats the sectors separately. The justification for such separate treatment must lie in some form of market imperfection, either in the rationality of agents, institutional constraints (such as differential access to capital markets by households and firms) or taxes.

There has long been some question whether stockholders can "pierce the corporate veil" and undo any changes in saving by the corporation that are inconsistent with their own lifetime savings plans. One cannot appeal here to liquidity constraints, for if a liquidity-constrained stockholder wishes not to save, he may respond to a firm's additional retentions by selling some of his shares in the firm. There must be a more fundamental irrationality present for there to be real effects, if markets are otherwise perfect. One method used in the past to assess this possibility was to include retained earnings in a consumption or savings equation. The notion was that corporate source income, whether in the form of dividends or retentions, should have the same effect on individual consumption behavior as other disposable income. For example, Feldstein (1973) found that retentions had a coefficient about two-thirds the size of that on current disposable income in a regression of consumption on these variables plus lagged disposable income and the current unemployment rate. Column (5.1) in table 5 presents a reestimate of this equation for the currently available sample period. (Because of a low Durbin-Watson statistic we correct for first-order serial correlation.) As is evident from the new regression results, the corporate retentions variable is now entirely insignificant, indicating an instability in Feldstein's estimated relationship. The retentions variable is significant in a familiar alternative specification, presented in column (5.2), which includes a lagged con-

Table 5

The Life Cycle Hypothesis and Corporate Saving
(Quarterly, 1960:II to 1982:I)

Dependent Variable: Consumption

Independent Variable	Model (5.1)	(5.2)
Intercept	-8.61 (-0.25)	-29.62 (-1.68)
Disposable Income	.61 (10.79)	.25 (3.57)
Disposable Income (lagged)	.28 (5.09)	--
Consumption (lagged)	--	.72 (9.46)
Household Net Worth	.009 (0.92)	.007 (1.27)
Corporate Retentions	-.02 (-0.10)	.30 (4.09)
Unemployment Rate	-.45 (-0.29)	2.11 (2.59)
Autocorrelation Coefficient	.87 (15.51)	.08 (0.63)
$\bar{R}^2$	.999	.999

Source: National Income Account Definitions of Consumption, Disposable Income and Corporate Retentions (Earnings less Dividends), all in 1972 dollars. Household net worth as constructed from Flow of Funds Data by Data Resources.

sumption rather than lagged income in the regression. However, it is unclear why the coefficients of retentions and disposable income should be the same, even if consumers are completely rational. As discussed by Hall (1978), consumption should depend on current variables such as disposable income, retentions and unemployment only to the extent that they were previously unpredictable. Thus, the coefficients of these variables in regression (5-2) represent the effects of their innovations on current consumption. There is no reason to believe that the coefficients of disposable income and retentions would be the same, even if consumers don't care whether they save or the corporations in which they hold stock save. This is because the innovations in retentions reflect not only changes in corporate savings policy, holding future prospects fixed, but also changes in future profitability. If corporations increase retentions substantially, this may cause an increase in consumption because business prospects have improved. Similarly, unexpected changes in disposable income, and it is labor income with which we should be concerned (Flavin 1981), will influence current consumption according to how permanent such changes are expected to be. Thus, unless we make strong and unwarranted assumptions about the relationship between the stochastic processes generating disposable income and retentions, we cannot give any structural interpretation to the coefficients in equation (5-2).

Thus, it is difficult to test whether national saving can be increased through greater business saving via consumer irrationality. Perhaps more importantly, though, this is not the only reason why an increase in business saving might have real effects. The tax system must be integrated into the analysis, since it upsets the Modigliani-Miller results.

IV. Taxes and Business Saving

The United States administers a "classical" corporate income tax, under which corporations and their stockholders are taxed independently, with stockholders being taxed only on dividends and capital gains actually realized from share ownership, rather than on all corporate income. The classical system of taxation has been abandoned by many European countries, who have switched to either partially or completely integrated tax systems (imputation systems). The logic behind taxing corporations as separate entities is unclear. Whatever its foundation, it has distortionary effects on the financial behavior of firms, and on their incentive to save and invest.

Just how the entire classical tax system does distort behavior has been the subject of much debate and research in recent years. The effects of the corporate tax alone were studied by Modigliani and Miller (1963), who pointed out that the provision for interest deductibility, with no similar allowance for dividends, provides an incentive for pure debt finance (and, presumably, no business savings at all) at the margin. However, the situation is complicated considerably by the existence of personal taxes. The two salient features of the personal tax system here are the progressivity of its marginal rates and its differential treatment of personal income from debt and equity. While interest payments are taxed fully, only dividends are taxed at ordinary income rates. Through the 60 percent exclusion of long term capital gains, and the taxation of such gains only upon realization (a tax that is forgiven if the gain is not realized before death), personal income from corporate equity is favorably taxed. There are two alternative views of how all of these taxes influence behavior, and they have very different implications for the effects of taxation on the incentives of corporations to save.

A. The Traditional View

The traditional view dictates that equity income is subject to double-taxation because earnings are taxed first at the corporate level, and then through the tax on dividends. This double-taxation may be lessened to the extent that a firm returns some fraction of its earnings and distributes dividends later, because then these earnings are compounded at the rate of return gross of personal tax; there is a deferral advantage.

Mathematically, if τ and θ are the corporate and personal tax rate, c is the accrual-equivalent of the capital gains tax, i is the after-tax rate of return required by shareholders, r is the rate of return on capital investments, and p is the dividend payout rate, then the corporation's decision to invest up to the point where a dollar of investment yields just a dollar in present value of after-tax equity income may be represented by the equation:

$$1 = \int_0^\infty e^{-it}\{(1-\theta)[pr(1-\tau)e^{(1-p)r(1-\tau)t}]-c\dot{v}_t\}dt \qquad (3)$$

where $\dot{v}_t$ is the change in the investment's values at time t. Since $v_t = e^{(1-p)r(1-\tau)t}v_0 = e^{(1-p)r(1-\tau)t}$, $\dot{v}_t = (1-p)r(1-\tau)e^{(1-p)r(1-\tau)t}$. Thus, equation (3) yields as a solution for the required rate of return, r:

$$r = \frac{i}{(1-\tau)[p(1-\theta)+(1-p)(1-c)]} \qquad (4)$$

That is, the effective tax rate on equity is $\tau+(1-\tau)[p\theta+(1-p)c]$. Since no such double taxation applies to debt, it is likely (though not certain) that debt finance will still be favored. However, various constraints on firm leverage may limit the extent to which the debt advantage can be explored, so that the double-taxation must be experienced on same corporate source income.

It is very much in the spirit of this traditional view of the corporate tax that many integration proposals of the past decade were put forward. For example, some "partial integration" or "dividend relief" schemes, such as a dividend paid or dividend received deduction, effectively would exempt from corporate taxation those earnings paid out as dividends. This would change equation (4) to

$$r = \frac{i}{[p(1-\theta)+(1-p)(1-\tau)(1-c)]} \qquad (5)$$

bringing the tax treatment of equity closer to that of debt. Full integration, or imputation of all corporate earnings to individuals, would result in a symmetric treatment of the income from equity and debt. All such integration schemes have been sen as a way of encouraging overall saving, because they would lower the tax rate on equity income. Their effect on the breakdown between business and personal saving would be less clear. Presumably, with the discouragement of dividend distributions lessened, there would be lower retentions and a smaller share of business saving.

B. The New View

While the foregoing view of equity taxation is appropriate for the case where firms issue new shares and follow a pattern of fixed dividend payout, it does not necessarily describe the way firms actually behave. Corporations (excluding regulated utilities, to which special tax rules apply) rarely issue new shares.[6] As such, their equity source funds come from retentions, with the key difference being that retentions cause an immediate reduction in the dividend taxes suffered by stockholders. Equation (3) becomes:

$$(1-\theta) = \int_0^\infty e^{-it}\{(1-\theta)[pr(1-\tau)e^{(1-p)r(1-\tau)t}]-cv_t^{\cdot}\}dt \qquad (6)$$

which (see Auerbach 1979b) for a detailed derivation) yields:

$$r = \frac{i}{(1-\tau)(1-c)} \cdot \qquad (7)$$

The taxation of equity income depends neither on the dividend tax nor the payout rate. Another, related implication is that the value of "Tobin's q," or the increase in equity value per dollar of new installed capital, is $(\frac{1-\theta}{1-c})$, rather than 1. These two results are really part of the same outcome. When a firm can finance through retentions, it will do so as long as it can increase shareholder wealth <u>after tax</u>. Since reinvestment avoids the dividend tax, substituting for it a lighter capital gains tax on the increase in share value, the firm needn't increase share valued by the full amount of the retention, but only $(\frac{1-\theta}{1-c})$ times this amount.[7] In equilibrium this margin is arbitraged by the firm, so there can be no benefit to the stock holder from a change in the firm's payout rate.

A corollary of this "capitalization" result is that equity only suffers double taxation to the extent of the very low capital gains tax. Moreover, since the dividend tax itself appears nowhere in the expression for the cost of capital, (7), a cut in the dividend tax would have no direct impact on the incentive to retain and invest. In fact, since the after-tax discount rate, i, is likely to rise with a general cut in personal taxes (because taxation of alternative forms of investment income would be lower) it would lead to a rise in the equity cost of capital. The important finding, though, is that the tax on <u>distributions</u>, rather than all income, has <u>no</u> effect at all on the incentive for businesses to invest (Bradford 1981). But because the long run value of q is $(\frac{1-\theta}{1-c})$, a reduction in the tax on distributions would lead to a

windfall gain to holders of corporate equity. Thus, any proposal that would provide "dividend relief" would be ill-advised as an incentive for capital formation. On the other hand, a reduction in the rate of corporate taxation would encourage equity investment and, presumably, investment overall.

C. Evidence on the Competing Views

The major difference between the "old" and "new" views of how equity is taxed lies in the assumed margin of finance for new investment. Under the old view, dividends are fixed and new investment is financed by the issuance of new shares. Under the new view, changes in dividends provide needed equity capital.

There are obvious problems with each of these hypotheses. As mentioned above, firms infrequently resort to the issuance of new shares. On the other hand, the dividend behavior of firms is very stable (see Brittain 1966). A realistic compromise between these two extreme views of the world would be the hypothesis that firms "normally" obtain their equity funds through retentions, but cannot vary their dividends substantially in the short run. Therefore, when large amounts of funds are required, they must issue new shares. This type of model, developed in Auerbach (1982b), is a hybrid of two extreme views of equity policy, since firms can find themselves either in a "retentions" regime or a "new shares" regime, with the values of Tobin's q and the cost of capital in the two regimes corresponding to those formulated above for each of the two hypotheses. This hypothesis was tested by Auerbach (1982b) with a twenty-year panel of 274 firms, using a model which relates ex post earnings

to previous financial and investment decisions. The empirical results strongly support the following conclusions:

(1) Firms face a higher cost of capital when they issue new shares than when they do not; and

(2) Firms held by investors in higher tax brackets face a lower cost of capital when investing through retentions.

These findings suggest that firms behave as predicted by the "new" view of the corporate tax, except when they are constrained in their dividend policy and must issue more expensive new equity to finance their investments. In particular, the declining cost of equity capital with the increase in shareholder tax rates is consistent with expression (7), since the after personal tax required return, i, would presumably be negatively related to the personal tax rate (and the capital gains tax rate is relatively unimportant).

Perhaps the most important implication of this evidence is that personal savings incentives, such as the recently liberalized Individual Retirement Accounts, are likely to discourage business savings through equity-financed investment because the effective rate of taxation of personal interest income is reduced more than that of equity income. Moreover, that part of the tax reduction that applies to dividend income, as opposed to interest income, is basically a lump sum transfer to the holders of corporate equity. Only with respect to equity finance through new shares does such a tax incentive have the desired effect. In recognition of this fact, one recent alternative proposal for corporate and personal tax integration in the U.S. (American Law Institute 1982) would have allowed a dividends paid deduction against corporate taxes only to the extent that dividends are associated with newly issued equity: integration for new equity only. Interestingly, almost the

identical scheme is currently in place in Sweden[8] which, like the U.S., still has a classical corporation tax. Referred to as the Annell deduction, it allows corporations to deduct against current profits dividends on newly issued shares for a period of up to twenty years, with the sum of deductions not exceeding the amount raised and no more than 10 percent of the amount deductible in any year. Other countries, such as the United Kingdom, have gone to a full imputation system.

V. Transitional Differences Among Savings Incentives

The foregoing analysis suggests that personal savings incentives, such as a reduction in the rate of dividend taxation, and business incentives, such as a corporate rate reduction, may differ markedly in their effects on investment. These differences arise from the distortions caused by the classical system of taxing corporations separately from their shareholders. A second way in which business and household savings incentives have differed *in practice* is in the transition from old to new tax treatment. Business incentives typically have been narrower in scope, in terms of focusing on new investment, than have personal incentives. While this difference in scope is not necessary in theory, there may be political reasons why it has been in practice. As we shall discuss, most savings incentives have important distributional effects as well as their intended efficiency effects. Incentives that focus only on new assets harm members of older generations. Though this is true regardless of whether households or businesses are the direct recipients of the tax incentives, the connection is much clearer when it is the former.

In this section, we compare these two types of incentives theoretically, give examples of their use, and present the results of simulation experiments that demonstrate how important such transitional differences can be. Since there is no theoretical importance whether the tax incentive is given to households or businesses, we analyze the former case.

Consider an individual who lives for two periods, receives labor income in the first period, and consumes in both periods, saving out of labor income to consume in the second. This individual's budget constraint is:

$$c_2 = (1+r)(wL-c_1) \tag{8}$$

where c_i is consumption in period i, L is labor supply, an w and r are the wage and interest rate. With taxes θ_r on capital income and θ_w on wage income, the net returns to capital and labor are $r(1-\theta_r)$ and $w(1-\theta_w)$, respectively. Thus, the budget constraint may be written:

$$\frac{1}{w(1-\theta_w)}c_1+\frac{1}{w(1-\theta_w)(1+r(1-\theta_r))}c_2 = L \qquad (9)$$

We may think of $P_1 = \frac{1}{w(1-\theta_w)}$ as the price, in labor units, of first-period consumption, and $p_2 = \frac{1}{w(1-\theta_w)(1+r(1-\theta_r))}$ as the price of second-period consumption. Since $p_2/p_1 = \frac{1}{1+r(1-\theta_r)}$, a capital income tax has the effect of raising the price of future consumption (Feldstein 1978). This disincentive could be removed in two structurally equivalent ways. Either capital income taxes could be removed, or both capital <u>and</u> labor income taxed could be removed and replaced with a consumption tax θ_c. These alternative regimes would yield the following budget constraints:[9]

$$\frac{1}{w(1-\theta_w)}c_1+\frac{1}{w(1-\theta_w)(1+r)}c_2 = L \qquad (10.a)$$

$$\frac{1}{w(1-\theta_c)}c_1+\frac{1}{w(1-\theta_c)(1+r)}c_2 = L \qquad (10.b)$$

There is no difference if $\theta_w = \theta_c$, in which case the present of tax revenues is also the same.

However, consumption and wage taxes differ in the timing of their collections. This means that a government wishing to spend all its revenues in the first period must run a deficit under a consumption tax regime, and pay the deficit back with second period tax revenues. Again, this involves no <u>real</u> distinction, but government does a greater fraction of national saving under the wage tax than under the consumption tax.

Once we consider the actual context in which such tax changes occur, however, real differences between wage taxes and consumption taxes are introduced by constraints on government behavior. Exact equivalence of the two systems would generally require the capacity to tax different generations at different rates, and to use debt policy. If government is constrained to impose uniform tax rates (or at least a uniform progressive rate schedule) and cannot borrow, the timing differences in tax collections lead to real differences both in the transition and in the long run under the alternative tax regimes. This is most easily seen by comparing the differential impact on retired individuals, who will pay no taxes under a labor income tax, but will face an increased tax burden under a consumption tax. As a result they will be far worse off under a consumption tax, and this added tax revenue will enable the government to impose a lower lifetime tax burden on future generations. Of equal importance, the consumption tax will in this context be more efficient than a wage tax, because these taxes on the elderly are essentially lump sum in nature.

These conclusions may be illustrated by comparing the results of simulations presented by Auerbach, Kotlikoff and Skinner (1983) of immediate transitions from a proportional income tax to a proportional consumption tax and to a proportional wage tax. The simulations are based on a dynamic, one sector general equilibrium model, which in any year is composed of fifty-five overlapping generations of individuals (each of whom may be thought of as adults who exist from age 21 to age 75) who make lifetime labor supply, retirement, and consumption decisions subject to perfect foresight. Preferencesare described by an intertemporally separable, nested CES utility function in consumption and leisure, with preference parameters based on relevant empirical studies. Production is assumed to obey a Cobb-Douglas function in capital and

labor. From the initial steady state, in which there is a proportional 30 percent income tax, the simulations trace out the path of the economy under an immediate switch to the new tax regime. Summary statistics of the long run and short run effects are given in Table 6. In the long run, under a consumption tax, the tax rate needed to maintain a balanced budget is only 28.29 percent, even though the tax base now excludes saving. This lower tax rate is associated with a higher level of utility. Expressed in terms of units of lifetime labor endowment, individuals in the long run are 6.28 percent wealthier than under the income tax. Under a wage tax, the long-run tax rate is 41.13 percent, and long run welfare is reduced by 3.46 percent. These differences in long run outcomes of transitions to structurally identical tax regimes is reflected in the differential impact on transition generations. Older individuals fare worse under a consumption tax; those aged 55 at the time of transition suffer a welfare loss of .65 percent of their full lifetime resources, and a much larger fraction of resources remaining. Under a wage tax, this same cohort gains .44 percent of lifetime resources. The fate of those aged 25 at the time of the transition is reversed, with a gain under the consumption tax and a loss under a wage tax.

Even when distributional effects are neutralized, the broader coverage of the consumption tax base to include consumption out of assets already in existence makes it a more efficient tax. With intergenerational redistributive effects neutralized by lump sum transfers and taxes that hold all pre-existing cohorts at the status quo level of utility and raise the utility of post-change generations by the same amount, there remains a sustainable 1.73 percent welfare gain under the consumption tax, but at 2.33 percent loss under the wage tax. This very large difference occurs because although the tax sys-

Table 6

Simulation Results:
Welfare and Savings Effects of
Consumption and Wage Taxes

	Tax Regime	
	Consumption	Wages
Long Run:		
Tax Rate (%)	28.29	41.13
Welfare Change (%)	6.28	-3.46
Transition Welfare Change (%)		
Age = 25	1.19	-2.61
Age = 55	-0.65	0.44
Efficiency Gain (%)	1.73	-2.33

Source: Auerbach, Kotlikoff and Skinner (1983).

tems are structurally the same, their transitional impacts are not.

In a richer model, further differences arise between consumption and wage taxes that make the consumption tax more efficient. One that is of particular relevance here is the treatment of pure economic rents.[10] Under a regular income tax, such rents would be taxed, but this would not be true under a wage tax. However, since the present value of consumption for an individual would, in this case, equal the present value of wages plus rent, a consumption tax would hit such rents.

If one turns to the real world, there is less evidence of a "bang" transition to a consumption or wage tax than a "whimpering" erosion of the personal capital income tax base. In practice all savings incentives enacted recently have had the salient characteristic of the wage tax of lowering the tax on income from existing assets. Some, such as the All-Savers' Certificates, followed the wage tax approach of a direct reduction in the tax rate on capital income. Others, such as the extension of access to Individual Retirement Accounts, followed the consumption tax approach of allowing a deduction for saving rather than a tax exemption for interest income. However, this differs from the consumption tax as simulated in that individuals face a tax in withdrawals from an IRA for consumption purposes only to the extent that they already have received a deduction for previous contributions made. The analogy to the simulated transition would be the declaration by the government that no existing assets may be placed in an IRA.

Put this way, it is hard to imagine the government ever enacting such legislation. But most of the investment incentives introduced over the past three decades have had this very characteristic of lowering the tax rate on

income from new investment while penalizing the holders of existing assets. This is true of the investment tax credit enacted in 1962 and raised in 1975, and of the accelerated depreciation provisions of 1954, 1971 and 1981. Only the corporate tax rate cuts of 1964 and 1978 followed wage tax treatment.

This relationship is most easily seen if we consider the most extreme case of accelerated depreciation, immediate expensing of new investments. As is well known since the work of Brown (1948), expensing is neutral under an income tax, because the tax contributes the same fraction to an asset's cost that it withdraws from its quasirents. It is simply a tax on pure rent. The government may be thought of as a partner in the enterprise, but there is no effective tax rate on capital income. But this is precisely how saving is treated under a consumption tax: a deduction of accumulation followed by a tax on withdrawals.[11] Similarly, consumption out of existing assets is taxed, although in a more indirect fashion. If old assets do not qualify for expensing, they are worth less than they otherwise would have been, by the value of the tax deduction that new assets receive. If we assume a constant production cost for new capital, then holders of old assets realize a capital loss equal to the tax rate times the asset replacement value when they sell the assets in order to consume -- precisely as they would if they received the full price for the asset and then had to pay a consumption tax. Like expensing, the introduction of accelerated depreciation or investment tax credits on new investment lowers the tax rate on new investment and induces a capital loss on existing assets. This could be avoided if, as with the Individual Retirement Accounts, all capital, whether new or existing, qualified for the new provisions. However, in contrast to personal savings incentives, this is typically proscribed. For example, the provisions of the Economic Recovery Tax Act

dealing with the Accelerated cost Recovery System expressly forbid the use of the new capital recovery schedules for assets purchased before January 1, 1981.[12]

This characteristic of business investment incentives is simply a different way of expressing more familiar arguments about the superior "bang for the buck" that capital incentives such as accelerated depreciation and investment credits have relative to corporate rate reductions. The latter apply to income from existing capital and pure economic rents, whereas the former do not. That such an argument should be so readily accepted at the business level but not at the personal level is somewhat distressing, but not difficult to understand in light of the common practice in tax legislation debates of distinguishing between "business" and "people" as if the two were not related in some fundamental way. However, given that such targeted savings incentives seem feasible only at the business level, this constitutes a strong efficiency argument in favor of business incentives.

VI. ACRS and Beyond

Recently the Accelerated Cost Recovery System has undergone its first facelift in the Tax Equity and Fiscal Responsibility Act of 1982; it is a safe bet that more will soon follow. As many analysts have pointed out,[13] the combination of the investment tax credit and fast write-off is more generous than expensing for equipment in the three and five year recovery classes. Revenue projections made before the most recent tax act suggested a continued drop in corporate tax collections as a fraction of government tax collections. The trend since 1965 is shown in Table 7.

The provisions of ACRS have strained the corporate tax system. The most obvious manifestation of this is the rise and fall of tax leasing over the past year. Leasing was introduced because the combination of low effective tax rates in general and large immediate deductions and credits meant that many firms, particularly those with high growth rates, would end the year with negative taxable income. Because the tax system allows only a limited carry back (three years) and carry forward (fifteen years now, but still without any accrued interest), such companies would face the prospect, without leasing, of not being able to avail themselves of the benefits accorded firms with taxable income. Leasing was liberalized to provide a paper transaction whereby such unused tax losses could be transferred between companies. While there are a number of problems with the way these transfers have been accomplished under leasing,[14] there is nothing inherently bad about having such transfers. Certainly, the reduction in leasing activity that will come from the recent tax legislation makes little sense from an economic perspective.

As a tool for stimulating business investment, ACRS has the above-

Table 7

Corporate Tax Revenues
1965-1987

(billions of current dollars)

(1) Fiscal Year	(2) Corporate Tax Revenues	(3) Federal Budget Receipts	% (2) of (3)
Actual*			
1965	25.5	116.8	21.8
1966	30.1	130.9	23.0
1967	34.0	149.6	22.7
1968	28.7	153.7	18.7
1969	36.7	187.8	19.5
1970	32.8	193.7	16.9
1971	26.8	188.4	14.2
1972	32.2	207.3	15.5
1973	36.2	230.8	15.7
1974	38.6	263.2	14.7
1975	40.6	279.1	14.6
1976	41.4	298.1	13.9
1977	54.9	355.6	15.4
1978	60.0	399.6	15.0
1979	65.7	463.3	14.2
1980	64.6	517.1	12.5
1981	61.1	599.3	10.2
Estimated**			
1982	50	631	7.9
1983	51	652	7.8
1984	62	701	8.8
1985	63	763	8.3
1986	64	818	7.8
1987	73	882	8.3

* Source: Economic Report of the President, various years.

** Source: Congressional Budget Office (1982). These projections now understate expected revenue because of the recently passed Tax Equity and Fiscal Responsibility Act of 1982. The Senate Finance Committee Report on the bill projects (on page 101) that its change will increase tax receipts by 42.3 billion dollars in 1987 and by smaller amounts in the intervening years.

mentioned advantage of being available only on new business investment. However, it has a number of disadvantages, aside from the difficulties faced by firms with tax losses. First of all, as with other recent tax changes such as the capital gains tax reduction of 1978, much of the argument in favor of ACRS was couched in terms of the need to offset inflation's effect on the value of depreciation allowances. However, though it more than offset this loss in present value of depreciation allowances, it did not alter the fact that even the current depreciation schedule still is based on historic cost and hence subject to fluctuations in value depending on the rate of inflation. Furthermore, through the simple system of three main depreciation classes, ACRS has given assets with very different economic lifetimes the same tax depreciation pattern. This has led to a great variation in effective rates of tax across assets as well as across industries according to capital stock composition.[15] In turn, this differential taxation can be expected to lead to a misallocation of business capital, causing an entirely unnecessary deadweight loss.

Alternatives to ACRS that suffer neither from this sensitivity to inflation nor the differential asset taxation include indexed economic depreciation or its present value equivalent (Auerbach and Jorgenson 1980), each of which, by restoring a true income tax, would result in an effective tax rate of 46 percent on all capital investments. Neutrality at a zero rate of tax would occur under expensing, and any intermediate rate of tax could be achieved through a linear combination of expensing and first-year present value economic depreciation. For an equity-financed asset that decays exponentially at rate δ, the user cost of capital to which the gross marginal product will be set equals:[16]

$$c=q(\rho+\delta)(1-k-\tau z)/(1-\tau) \qquad (11)$$

where q is the relative price of capital in terms of output, ρ is the firm's real, after-corporate tax discount rate, k is the rate of investment tax credit, and z is the present value of depreciation allowances. Since the gross-of-tax internal rate of return on such an asset is $(\frac{c}{q}-\delta)$ and real required return is ρ, the effective tax rate may be expressed as:

$$\phi = \frac{(\frac{c}{q}-\delta)-\rho}{(\frac{c}{q}-\delta)} \qquad (12)$$

Since economic depreciation would yield a present value of depreciation allowances of $z = \frac{\delta}{\rho+\delta}$, a system with no investment tax credit and a single, first-year depreciation deduction of $\alpha(\frac{\delta}{\rho+\delta})+(1-\alpha)$ would yield an effective tax rate of $\alpha\tau$ for each asset, where τ (currently .46) is the statutory corporate rate.

This analysis assumes equity financed investment. Given the coexistence of debt and equity finance, it is hard to know how to measure effective tax rates. Presumably, firms each choose some optimal debt-equity ratio, but this decision is separable from the investment decision only under restricted circumstances. If, for example, a firm's "debt capacity" increases more with investment in safe, easily identified (and, potentially, easily attached) capital goods, the tax advantage of debt finance may be greater for such goods and their effective tax rate overstated, at least relative to other assets. While little concrete evidence for this viewpoint is available, it would, if correct, imply that the tax disadvantage of structures under ACRS has been overstated.

Given the low current rate of corporate taxation, and all of the problems that still remain, some have suggested that the corporate income tax should be

repealed. This certainly would remove the distortions of the corporate tax. However, particularly for assets that currently receive the equivalent of expensing, this would result in a perverse reversal of the type of "consumption-tax capitalization" discussed above.

Consider again the simple case in which investments are expensed under the income tax, and imagine a transition to a situation with no income tax: in the previous context, a transition from a consumption tax regime to a wage tax regime. Assets that had received a deduction upon investment would now escape taxation of their quasirents, along with new assets not permitted expensing. Since old and new assets no longer would differ in their prospective depreciation allowances, they would sell for the same price, with a resulting instantaneous windfall gain for holders of previously discounted old capital. The net effect would be a lump sum transfer to holders of existing capital.

Naturally, the current situation is more complicated than one of simple expensing, but this argument suggests that it is expensing toward which we should move, rather than abolition. Full equivalence at the margin with a zero corporate tax would be provided by extending the same treatment to financial assets: "expensing" net nominal purchases, and continuing to include interest payments in income. For the typical nonfinancial corporation, this provision would represent an increase in present value tax liabilities. The result would be a corporate version of the personal consumption tax. That is, if the firm's annual pre-tax cash flow is:

$$f = X - I + \Delta B - iB \qquad (13)$$

where x is the gross return to previous investments, I is current gross

investment, ΔB is new debt issues, and iB is interest payments, a corporate tax at rate τ with interest deductibility and immediate expensing of investment less new borrowing would yield and after-tax cash flow of $(1-\tau)f$. As with the individual, the corporation is taxed on its cash flow which, in this case, represent stockholder dividends. Under the "new" view of the corporate tax described above, this is equivalent to a nondistortionary tax on distributions. This method of transition to a zero tax rate at the corporate level, as part of the move to a consumption tax, was suggested for the U.K. by the Meade Committee (Institute for Fiscal Studies 1978).[17]

While such a system would increase the present value of corporate taxes collected,[18] it probably would decrease them in the short run because of the change in the timing of the tax payments. Rough static calculations suggest it would be three or four years before the new tax system would raise more revenue than ACRS.

A remaining problem that must be addressed is that of tax losses. Unless the corporate tax is eliminated, there will remain a number of companies with unusable tax credits and deductions. Were there refundability, leasing would be unnecessary. However, moves to make even the investment tax credit refundable have met considerable resistance in Congress, and now leasing is being scaled back. The current system of loss carry-forwards has two effects. Since losses carried forward do not accrue interest, and can expire unused, firms possessing them obtain a lower present value of tax deductions than they would under a full loss-offset. However, <u>because</u> of the fact that such deductions lose value over time, the firm has an incentive to overinvest in activities that will generate taxable income against which the losses an be used. In the extreme case, with some carry- forwards expiring unused, they represent

free goods with a zero shadow price. The result may be that firms with accrued losses are at a competitive advantage relative to taxable firms. In this light, proposals to allow carry-forwards to be taken with interest are a mixed blessing. While they will remove the incentive for firms to speed up the use of carry-forwards, they will also increase the likelihood of some of the carry-forward expiring unused. One proposal that deals with this problem (Auerbach 1982a) would give firms a choice of carrying losses forward with interest or taking a current lump sum payment, the latter sufficiently discounted so that it would only appeal to firms not expecting to utilize the carry forwards in the future.

VI. Conclusions

This paper has focused on structural issues related to business saving, rather than on empirical evidence concerning what we can expect specific savings incentives to do to capital formation. This emphasis is necessary, because it is only institutional aspects of the tax system and the political process that make business saving an important concept distinct from a broader measure of national saving. In the absence of such "imperfections" in the competitive process, business saving is simply an accounting concept.

Because of inflation, even the definition of business saving is uncertain, though it appears to have followed the downward trend characterizing personal saving in the U.S. in recent years. There is some evidence that corporate savings policy accounts for the fact that earnings are measured with error. It is difficult to evaluate the proposition that savings can be increased by taking advantage of shareholder ignorance of firm decisions, but the existence of a classical corporation tax in the U.S. means that the overall incentive to save does depend on whether the savings is done by businesses, though retentions, or households, through the purchase of new corporate securities. Another institutional difference between business and personal savings incentives lies in the political difficulty of introducing targeted incentives at the personal level that induce losses in the value of existing assets. Such incentives are the rule at the business level, and are much more efficient in their effects.

The Accelerated Cost Recovery System has not dealt adequately with the distortions imposed by the corporate tax, and it has made more acute the problems caused by the tax system's lack of a full loss offset. However, solu-

tions to these problems exist that do not require the abolition of the corporate tax.

Finally, one should keep in mind that the best designed business savings incentives can only aid in producing a climate hospitable to increased business investment. Despite the negative tax rates of ACRS, fixed nonresidential investment has been lower in real over the first half of 1982 than it was during 1981. Recent levels of real interest rates and capacity utilization probably will dominate any tax incentives that one can reasonably envision.

Footnotes

1. Economic Report of the President 1982, Table B-23.

2. Id Table B-82.

3. Data Resources USMODEL databank.

4. This expression is obtained in the following way:

   The present value of depreciation allowances remaining per dollar of asset basis is $(\frac{\delta}{r+\delta})$, where $\delta = 2/T$. The basis, in real terms, of N real dollars of assets purchased in year t-s, in year t, is $N(1-\delta-\pi)^s$. Thus, total basis is:

   $$(N+N(1-\delta+\pi)+N(1-\delta+\pi)^2+\ldots)\cdot\frac{\delta}{r+\delta} = (\frac{N}{\pi+\delta})(\frac{\delta}{r+\delta})$$

   These have a value in tax savings of $\tau(\frac{N}{\pi+r})\cdot(\frac{\delta}{r+\delta})$, which loses value annually at rate π.

5. Indeed, one could argue further, following Barro (1974), that government deficits are of no importance if they simply substitute for taxes, since the form in which resources are taken from the private sector is not important. Like the Modigliani-Miller irrelevance proposition, this result depends on the absence of distortionary taxation and the full rationality of private agents.

6. See Auerbach (1981) for relevant statistics.

7. If a dollar of dividends is foregone, the stockholder loses $(1-\theta)$ dollars after-tax. If equity increases in value by q, his after tax gain is $q(1-c)$, given the way we have defined c. Thus, they are equal when

$q=(\frac{1-\theta}{1-c})$.

8. See King et al (1982) for a detailed discussion.

9. The consumption tax here is defined with respect to the tax inclusive base; that is, θ_c is the fraction of gross expenditures on consumption collected in taxes.

10. See Helpman and Sadka (1982).

11. Although all quasirents are taxed with expensing, new investment out of such rents receies a new deduction, so only the net withdrawals are taxed.

12. While one could qualify for the new treatment by buying a used asset after the effective date, there would normally not be a pure tax gain from engaging in such a transaction, due to the existing recapture provisions. See Auerbach (1982a) for further discussion.

13. See, for example, Auerbach (1982a).

14. See Warren and Auerbach (1982) for a detailed analysis.

15. See the Economic Report of the President (1982), Chapter 5 for relevant calculations.

16. This analysis follows Auerbach (1979a).

17. The U.K. currently has an integrated tax system, expensing of equipment and interest deductibility at the corporate level. See King et al (1982) for further discussion.

Brittain, J.A. 1966. Corporate Dividend Policy. Washington, D.C.: Brookings Institution.

Brown, E.C. 1948. "Business-Income Taxation and Investment Incentives." In L. Metzler et al., Income, Employment and Public Policy: Essays in Honor of Alvin H. Hansen. New York: W.W. Norton.

Congressional Budget Office. 1982. "Baseline Projections for Fiscal Years 1983-1987," February 5.

Feldstein, M.S. 1973. "Tax Incentives, Corporate Saving and Capital Accumulation in the United States." Journal of Public Economics 2(2), April, pp. 159-71.

_____. 1979. "The Welfare Cost of Capital Income Taxation." Journal of Political Economy 86(2), April, pp. S29-S51.

Hall, R.E. 1978. "Stochastic Implications of the Life Cycle-Permanent Income Hypothesis: Theory and Evidence." Journal of Political Economy 86(6), December, pp. 971-987.

Flavin, M.A. 1981. "The Adjustment of Consumption to Changing Expectations about Future Income." Journal of Political Economy 89(5), October, pp. 974-1009.

Helpman, E. and E. Sadka. 1982. "Consumption versus Wage Taxation." Quarterly Journal of Economics 97(2), pp. 363-372.

Institute for Fiscal Studies. 1978. The Structure and Reform of Direct Taxation. London: Allen & Unwin.

King, M. et al., The Taxation of Income from Capital; A Comparative Study of the U.S., U.K., Sweden and West Germany. NBER, forthcoming.

Lintner, J. 1956. "Distribution of Incomes of Corporations Among Dividends, Retained Earnings, and Taxes." American Economic Review Papers and Proceedings 46, pp. 97-113.

Miller, M. and F. Modigliani. 1961. "Dividend Policy, Growth and the Valuation of Shares." Journal of Business 34(3), pp. 411-33.

Modigliani, F. and M. Miller. 1958. "The Cost of Capital, Corporation Finance and the Theory of Investment." American Economic Review 48, pp. 261-97.

_____ and _____. 1963. "Corporate Income Taxes and the Cost of Capital: A Correction." American Economic Review 53:55-84.

U.S. Senate, Committee on Finance. 1982. Tax Equity and Fiscal Responsibility Act of 1982, Report, July 12. Washington: U.S. Government Printing Office.

Warren, A.C. and A.J. Auerbach. 1982. "Transferability of Tax Incentives and the Fiction of Safe Harbor Leasing" Harvard Law Review 95(8), pp. 1752-1786.