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6 The Economic Effects of the Corporate Income Tax: Changing Revenues and Changing Views

Alan J. Auerbach

6.1 Introduction

Corporate income tax revenues have declined steadily as a fraction of U.S. GNP over the past three decades, from 5.3% in 1953 to 4.1%, 3.3%, and 1.8% in 1963, 1973, and 1983, respectively (Economic Report of the President 1984, tables B1, B76). Indeed, this decline is even more striking if one subtracts from corporate revenues the remittances by the Federal Reserve System of their seignorage. In fiscal 1983, corporation income tax receipts net of these payments were only $37.0 billion (Economic Report of the President 1984, table B72), or just over 6% of federal revenues.

This trend might appear to have clear implications both for the distribution of after-tax income in the United States and for the incentives that corporations have to invest in plant and equipment. But such aggregate tax measures can be very misleading because they are, at the same time, too comprehensive and yet incomplete. They do not relay the different incentives and burdens imposed on different investors and different assets, nor do they account for other taxes which, in combination with the corporate tax, determine the tax burden on owners of corporate capital and the incentives that such individuals have to invest via the corporation.

In this paper, I discuss four related issues that must be considered before the economic effects of the corporate tax can be understood. These are the additional taxes on corporate source income levied on dividends, capital gains, and interest payments; the presence in the tax code of investment incentives such as accelerated depreciation; the corporate tax treat-

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ment of risky income; and the determinants and implications of corporate borrowing. I conclude with a review of this discussion.

6.2 Shareholders' Taxes and "Double" Taxation

Many who favor a reduction in taxes paid by corporations see such a reduction as an offset to the "double" taxation occurring when corporate profits are taxed at the corporate level and then, if distributed, at the shareholder level. Compared to investment income from an unincorporated business, there is, indeed, a second layer of taxation. Even for earnings that are retained, associated increases in the corporation's value may eventually be subject to individual capital gains taxes.

Traditional economic analysis (e.g., Harberger 1962) suggests that such a pattern of taxation discourages corporate investment and, by doing so, causes part of the extra tax burden to be shifted from corporate shareholders to others in the economy: other investors, who find their returns diminished by the flood of capital from the corporate sector; purchasers of corporate commodities, who must pay higher prices for goods that have become more expensive to produce; and, potentially, wage earners, if the demand for labor is less intensive in the expending areas outside the corporate sector than within it.

Associated also with this hypothesized shift in resources is an economic distortion, in that investors are being encouraged by the tax system to forgo relatively more profitable corporate sector projects to avoid the extra taxation.

But the taxation of dividends does not necessarily lead to this type of outcome. The question is best put in the following way: does the taxation of dividends mean that corporations must earn a higher rate of return, before tax, to satisfy their shareholders' required after-tax return? The answer may very well be that they need not do so. Consider an investment financed by the method most commonly used to raise equity capital, the retention of earnings. Suppose the potential project will earn 10% a year after corporate taxes, all of which will be distributed as dividends. These dividends will then be subject to additional taxes, unless the shareholders are exempt from taxation. But this does not mean a lower rate of return than 10% for individual investors. Consider the initial investment these investors made when the firm retained its earnings. The cost to investors was the forgone dividends, less the taxes that would have been due on such dividends. For the sake of concreteness, suppose the typical investor's marginal tax rate is 40%. Then, per dollar of retained earnings, the investor had to give up 60 cents out of pocket to get this stream of 10% returns, which will also be taxed at 40% to yield a net return of 6% per *gross* invested dollar but 10% of forgone, after-tax dollars.

Lest this result be dismissed as anomalous, the reader should note its equivalence to the treatment accorded individual savings under a consumption tax, which is recognized to leave the return to savings effectively untaxed. Under a consumption tax scheme, savers would receive a reduction in their tax base for amounts saved through the corporation and add to the tax base amounts received and not saved.

This argument suggests that while taxes on dividends may be paid, they need not constitute a disincentive to save via the corporation. In this sense, there is no double taxation: only the corporate income tax lowers the saver's rate of return. As with a consumption tax, taxes on dividends currently received represent the payment, with interest, of a tax liability deferred by the previous retention of earnings.

A corollary of this view is that corporations face a higher marginal tax burden when they must raise equity capital through the issuance of new shares, because there is no initial reduction in stockholders' taxes when the shares are issued.

Empirical evidence offers some support for this position. In an earlier paper (Auerbach 1984), I attempted to measure how the rates of return required by corporations on their investments differed according to a number of factors, including how these investments were financed. Using data from the period 1963–77 for 274 major American corporations (most listed on the New York Stock Exchange, the remainder on the American Exchange), I first corrected income statement information to give a truer measure of annual earnings, and then estimated equations to determine the effects of a number of firm characteristics on future earnings. One significant finding was that, for given levels of investment, firms issuing new shares in a particular year experienced higher increases in earnings in subsequent years than those that invested solely through retentions and debt issues. The results suggested that this sample of firms required, on average, about 4.8% more, after tax, when financing investments through new issues. Additional evidence suggested that this phenomenon is associated with individual taxation, rather than other potential reasons for an aversion to new issues.

This finding has several interesting implications. First, corporate stock normally will trade at a discount relative to the intrinsic value of the firm's assets. This is due, not to any irrationality on the part of investors, but to the fact that firms have the incentive to retain earnings as long as the market value of new projects undertaken is at least equal to their net cost to investors. Hence, a retentions-financed project costing $1 million has a net cost of $600,000 to investors in the 40% tax bracket. The management of the firm will increase its shareholders' assets by undertaking the project as long as the firm's value increases by at least $600,000 *not* $1 million.

Second, this discount means that there is an incentive for corporations to invest in corporate stock, either their own, through repurchases, or that of others, through acquisitions. This provides a direct way of obtaining assets at a price below their intrinsic worth. The puzzle is why firms do not engage in more of this kind of activity.

Third, a general reduction in the taxation of dividend income would have very different consequences than reduced corporate taxation. Since the dividend tax does not influence the marginal tax rate for investment financed through retention, its reduction will not affect these investment decisions, despite the decline in corporate revenue.

6.3 The Impact of Investment Incentives

One reason for the decline in corporate tax collections since 1953 has been a decline in corporaate profitability. Another has been the reduction (from 52% to 46%) in the corporate tax rate. However, the most important factor has been the introduction of several investment incentives, culminating in the Accelerated Cost Recovery System instituted in 1981. For a number of reasons, the effects of these programs on the incentive to invest cannot be judged from trends in corporate tax revenues.

First, these programs were generally not retroactive. As a result, there could be relatively small change in actual tax payments in the years immediately following a new investment incentive, particularly for corporations with slower growth. However, even several years after such a program's enactment, concurrent tax payments offer little guidance about the corporation's incentive to invest. This is because investment incentives such as the investment tax credit or the shortening of depreciation lives work by reducing income taxes in the years immediately following an investment. In later years, the corporation will actually pay more taxes on the income from the investment, since depreciation allowances will have been exhausted. The net effect to the corporation is positive but is overstated by the tax reduction in the earliest years. Hence, a fast-growing corporation with a very "young" capital stock might offset all its *current* tax liability, but this will not be true in the future. A stagnant corporation with a very "old" capital stock might have no tax credits or depreciation deductions at all, but this overstates the tax burden on investment by failing to account for the tax benefits that were received in the years soon after the firm's capital goods were purchased.

In a sense, each investment faces a different tax rate on its income in each year, with this rate increasing as the asset ages. What matters for the investment decision is the present value of taxes paid over the asset's entire life, not the taxes paid in a given year.

This point may be illustrated by a numerical example. Imagine an asset purchased for $1000, yielding 20% per year before depreciation and re-

ceiving a 10% investment tax credit and a standard 5-year ACRS write-off. Suppose that the asset actually depreciates at 10% per year. That is, each year its income is 10% lower than in the previous year. Also suppose, for the sake of simplicity, that there is no inflation. Then the asset's income and tax payments over time are as given in table 6.1. Shown in parentheses below actual depreciation allowances are those that would correspond to the real or "economic" depreciation of the asset, of 10% per year. This figure is deducted from gross income to obtain a measure of actual economic income, against which taxes are compared to obtain each year's tax rate for the asset.

Because of the investment incentives, this tax rate is negative for the first 5 years but very positive thereafter. It would be no more correct to say that firms with 3-year-old assets have a tax rate of −21% (never mind how they manage to obtain these refunds—I return to this below) than that firms with 6-year-old assets face one of +92%. The overall impact is somewhere in between.

This impact can be measured by taking the present value of taxes paid and finding the constant tax rate on economic income that would yield the same value. Table 6.2 (taken from Auerbach 1983) gives these calculations for two types of assets, general industrial equipment and industrial structures, and for all corporate fixed assets as a whole, for the years 1953–82. They are based under the assumptions that corporations used the most generous available tax treatment in each year, that they required a return of 4% after tax, and that they projected inflation based on past inflation behavior. Aside from the general decline in tax rates, except for a few years during the 1970s, there has been a shift in the tax burden from equipment to structures. This would appear to present the incentive for corporations to invest more in equipment, relative to structures, than is socially de-

Table 6.1 **Tax Rates for a Hypothetical Asset**

	Year						
	1	2	3	4	5	6	7
Gross income	200	180	162	146	131	118	106
Depreciation allowance	143 (100)	209 (90)	200 (81)	200 (73)	200 (66)	0 (59)	0 (53)
Investment credit	100	0	0	0	0	0	0
Taxes	−74	−13	−17	−25	−32	+54	+49
Economic income	100	90	81	73	65	59	53
Tax rate (%)	−74	−14	−21	−34	−49	+92	+92

Table 6.2 Effective Tax Rates for Equipment and Structures, 1953–82 (%)

Year	General Industrial Equipment	Industrial Structures	All assets
1953	64.1	55.6	58.8
1954	61.0	52.3	55.5
1955	58.2	50.6	53.5
1956	59.3	51.3	54.3
1957	60.2	51.9	55.0
1958	60.9	52.3	55.6
1959	59.7	51.5	54.6
1960	60.4	52.0	55.1
1961	58.8	51.0	53.9
1962	40.3	49.1	43.3
1963	41.5	49.6	44.0
1964	27.4	47.1	37.2
1965	26.1	45.5	35.7
1966	27.4	45.8	36.5
1967	49.4	46.6	45.5
1968	37.0	51.5	43.5
1969	41.0	52.7	45.8
1970	53.5	52.0	49.7
1971	53.2	51.2	49.1
1972	16.4	51.2	32.9
1973	14.4	50.9	31.8
1974	18.3	51.5	33.9
1975	24.1	52.6	37.0
1976	26.4	53.1	35.1
1977	21.2	52.1	32.0
1978	23.2	52.4	33.2
1979	19.0	50.3	30.1
1980	22.0	50.8	31.9
1981	−6.8	41.7	17.7
1982	8.4	42.1	24.6

sirable, but there is an important qualification to this conclusion that will be discussed below in the section dealing with corporate borrowing.

The negative tax rate for equipment in 1981 means that the negative tax liabilities of the early years (as illustrated in table 6.1) outweighed the positive ones of later years. Such investments led to a net tax refund for investing corporations.

Aside from the distinction between these effective tax rates and those tax rates calculated by comparing current taxes to current income, there are other important implications of the presence of incentives in the tax structure. First is the increased possibility of negative tax liabilities, even for profitable firms. Because of the corporate tax treatment of losses, this may have a very unpredictable impact on the incentives for firms to in-

vest. Second, because new assets have yet to receive their investment incentives, they will be worth more to corporations than otherwise identical but older assets already in place. Refer again to table 6.1, and imagine a company with two pieces of equipment of comparable productive capacity. One was just purchased, while the other is 6 years old. The first is clearly more valuable, because it has the prospect of 5 years of refunds before it must start paying taxes. All the older asset has in its future is years with no depreciation deductions at all. Not only does it receive no investment incentives, but it must repay the deferred taxes associated with the forward shifting of depreciation allowances.

What this means is that, per dollar of capital, existing assets will generally be worth less than new assets. The estimated extent of this discount is shown in table 6.3 (taken from Auerbach 1983). The number shown is the

Table 6.3 Ratio of Market Value to Replacement Cost: The Impact of Deferred Taxes

Year	Ratio
1953	.921
1954	.898
1955	.908
1956	.924
1957	.935
1958	.940
1959	.940
1960	.946
1961	.945
1962	.894
1963	.900
1964	.893
1965	.898
1966	.899
1967	.927
1968	.889
1969	.890
1970	.928
1971	.926
1972	.867
1973	.864
1974	.865
1975	.867
1976	.845
1977	.834
1978	.835
1979	.838
1980	.838
1981	.781
1982	.792

ratio of the total value of the aggregate corporate fixed capital stock, taking accounts of these tax differentials, to the value these assets would have if all were equally productive but treated as new assets by the tax law. Based on the size of the corporate capital stock, I calculated this gap between actual value and replacement cost to be $427 billion in 1982. This was the present value then of taxes due on old assets in excess of the taxes on comparable new assets. Combined with the capitalization effect associated with dividends, discussed in the previous section, this has the potential to explain a large gap between the intrinsic value of assets owned by corporations and their stock market values.

6.4 The Corporate Tax and Risk Taking

There are several ways in which the corporate tax affects the decision to invest in risky assets. In each case, a corporation's tax payments as a percentage of income offer little guidance about the incentives actually faced.

Perhaps the most important of these effects is associated with the corporate income tax's asymmetric treatment of a corporation's gains and losses. Income is fully taxable, but losses do not lead to a refund at the corporate rate. Instead, taxpayers must either carry the losses back for an immediate refund or, if recent income is insufficient, carry the losses forward to await deduction against future income or expiration. Further, similar restrictions exist on the use of tax credits, such as the investment tax credit.

This asymmetry means that a corporation with risky income will, in present value, pay more taxes in the future than if the income had the same expected return but were always positive. Hence, risk taking is affected. But to know *how* it is affected, one must know the firm's current tax status as well as the types of projects it is considering. Indeed, it is possible that firms with taxable income, paying taxes, are at an advantage relative to firms that are not. This is more likely given the recently increased acceleration of depreciation allowances discussed in the previous section.

While the prospect of not being able to get a refund for potential losses may discourage the undertaking of risky projects, firms that already have incurred such losses may carry forward a tax shield to reduce taxes on future income, thereby lowering taxes in the future. If, on average, the firm expected its current investments to yield additional tax liability, this shield would provide an added incentive to invest. However, as shown by the example in table 6.1, many investments now will generate negative tax liabilities in their early years, even if they earn a normal rate of return. Hence, a tax shield carried forward may actually make such investments less attractive by making the deduction of these additional losses impossible. This is offset by the fact that in subsequent years, when the assets generate positive tax liabilities, these are more likely to be shielded from taxation.

To measure the net impact of these effects, I considered (Auerbach 1983) how the expected present value of taxes associated with different assets would be affected by a firm's initial tax status and the probability that this tax status would change from year to year. Using data from 1959 to 1978 for several hundred major U.S. corporations, I estimated the probability of having a net tax loss carry-forward in any given year and the probability that this loss would be exhausted in the next and subsequent years. I then measured the taxes that representative firms, purchasing an asset with a riskless, 6% return annually after depreciation, would expect to pay in each year over the asset's life. Each calculation proceeded in two steps. First, the annual accrued tax liability for each year, such as those shown in table 6.1, was calculated. Then, estimates were made of when, statistically, each of these liabilities would actually result in a tax payment. Since a firm might have a tax loss carry-forward (from other parts of its operations) in each year, there is some probability that each year's tax payment would be deferred, more so for firms beginning with a large tax loss carry-forward in the year of the investment.

To test the effect of different conditions on the results, I performed these calculations for both industrial equipment and industrial structures; for zero, medium, and high rates of inflation; and under depreciation provisions that existed in 1965, 1972, and 1982. For each assumption of asset types, inflation rate, and tax law, the calculation was done for two representative corporations: one starting off with a substantial current tax liability and the potential for a tax loss carry-back, and one beginning with a large tax loss carry-forward. These firms are labeled "high tax" and "low tax" for the results shown in table 6.4. The numbers in the table are

Table 6.4 **Effective Tax Rates: The Importance of Deferred Payment, by Taxable Status (%)**

Tax Law and Inflation Rate	General Industrial Equipment		Industrial Structures	
	Low Tax	High Tax	Low Tax	High Tax
1965 tax law:				
No inflation	17	12	37	37
4%	33	30	48	48
8%	47	43	53	53
1972 tax law:				
No inflation	12	7	40	38
4%	28	23	52	52
8%	40	35	57	57
1982 tax law:				
No inflation	−3	−15	27	25
4%	10	−3	37	35
8%	20	5	42	42

"effective" tax rates, as described above, calculated as the tax rate on economic income that would leave firms with the same expected present value of taxes from the investment.

The table offers a number of familiar results. For each type of investor and asset, the tax changes from 1972 to 1982 led to lower tax liabilities. For any given asset, investor, and year, an increase in the inflation rate led to higher tax payments because of the declining real value of depreciation allowances. As depicted above, recent tax changes have greatly increased the relative tax incentive to invest in equipment instead of structures.

The main new result in the table is that firms in the "high tax" position were likely to pay less in taxes on their new investments than their "low tax" counterparts, because of the greater likelihood of obtaining the full value of the early years' negative tax liabilities. This has become especially true for equipment since the most recent tax law changes. Hence, the observation of one firm paying a larger fraction of its earnings in taxes than another is certainly a poor guide to the relative incentives for these firms to undertake new investment.

An implication of these findings is that those firms with existing profitable operations providing taxable income are better disposed to undertake new investments, either directly or through the purchase of other firms making these investments. Once again, the tax system provides an extra incentive for the acquisition of one firm by another.

6.5 Determinants of Corporate Leverage

An element of corporate policy that adds to each of the preceding ones and helps tie them together is the debt-equity decision. While the advantages of retaining earnings instead of issuing new shares are fairly clear, the decision of how much growth to finance internally and how much through the flotation of debt has many interesting and complex aspects. There are theories to explain how much corporations borrow, when they borrow, and the maturity structure of their borrowing, but these theories are often incomplete predictors of actual behavior.

The tax law plays a central role in most models of corporate leverage, and its recent changes motivate some of the current interest in the question of what determines corporate borrowing. As shown above in sections 6.3 and 6.4, estimates suggest that the effective tax rates on structures lie substantially above those on equipment. Further, nondepreciable assets, such as land and inventories, do not qualify for any investment incentives comparable to those available for plant and equipment. This suggests that there exists a potentially serious distortion in the choice of corporate investments, but such a conclusion is necessarily valid only if a separation prevails between real and financial corporate decisions. If, in contrast, there are tax advantages to borrowing, and leverage is more acceptable to

corporations when investing in structures or land than in equipment, this might offset the tax disadvantage of the former assets to which we have already alluded.

In another paper (Auerbach 1985), I estimated models of the determinants of corporate borrowing. Before discussing the actual results, it will be useful to review briefly some of the theories that lie behind the model.

Most theories of corporate leverage begin with the twin observations that corporate taxation appears to bias the choice of financial policy completely toward debt and that corporations typically finance perhaps only one-quarter of their accumulations of capital by issuing debt. The challenge is to explain why this is so.

The most basic explanation for observed debt-equity ratios is costly bankruptcy. However, empirical evidence tends to refute the notion that potential bankruptcy costs alone are of the same magnitude as the corporate tax advantage to debt. Moreover, additional borrowing may lead to other costs, referred to in the finance literature as "agency" costs, associated with the idea that it is difficult for holders of long-term bonds in a firm to protect themselves from the firm's taking subsequent action that is detrimental to their interests, such as the commencement of an extremely risky new investment program. With limited corporate liability, this act imparts some of the program's risk to holders of debt. In anticipation of such behavior, lenders might demand a high-risk premium from firms with a high probability of engaging in such activity, such as firms with high debt-equity ratios.

One would expect a firm's potential agency costs to differ according to a number of characteristics in addition to its debt-equity ratio. Myers (1977) suggests that the problem is more acute for "growth" firms whose value derives largely from anticipated future decisions, since they possess more flexibility in their actions. Presumably the same argument holds for firms whose capital stock has a short maturity, for these firms' future replacement investment decisions loom much larger. This could be a reason for firms that use structures relatively more than equipment in their production processes to borrow more, or at least borrow more long term.

Additional explanations for the limitation on corporate borrowing come from suggestions that other *tax* factors act, cumulatively, to offset the tax advantage to borrowing, so that at a certain point the net tax advantage to borrowing disappears. At the corporate level, the tax advantage to debt is lost if firms do not have sufficient taxable income to deduct their interest payments. As firms borrow more and attempt to deduct more interest, this eventuality becomes ever more likely. This is the essence of the argument offered by DeAngelo and Masulis (1980). The hypothesis has a number of testable implications. First, firms with substantial loss carry-forwards should choose to issue less debt. (Care must be taken since such firms may also be in greater need of funds.) Second,

firms investing in assets with a greater fraction of their total after-tax returns generated by tax credits and deductions should also use less debt finance, for they typically will have less taxable income for any given level of borrowing. Again, this is a reason why firms might borrow less to finance purchases of equipment. Finally, one would expect that firms with riskier earnings streams would be less likely to borrow, for these firms would face a more likely prospect of having insufficient taxable income, in any given year, to deduct all interest payments.

As with the pure bankruptcy explanation, this "limited tax shield" argument, by itself, is unlikely to be important enough to explain the typical firm's observed borrowing behavior. As part of the study of tax losses (Auerbach 1983), I estimated the present value of tax deductions from an additional dollar of debt for a typical firm and found that such a firm could expect to get about 92% of the value of these deductions. Equivalently, this would be as if firms could deduct interest payments regardless of their own tax status, but at a 42% rather 46% tax rate. This is still a substantial tax benefit.

However, this differential is diminished by the consideration of personal taxes. Miller (1977) argued that the individual tax advantages to equity may offset those to debt at the firm level. The basic argument is that since, at the individual level, interest payments are taxable, while only dividends and not capital gains are taxed fully, the individual tax burden on the return to equity is lower than that on debt. In its simplest form this explanation is implausible, since the corporate tax on all equity earnings plus the additional dividend taxation of that part of the individual return to equity that is distributed to shareholders is substantially higher than the individual tax on interest income, regardless of the individual's tax bracket. However, this effect may lessen the initial tax advantage to leverage and, in conjunction with other reasons for limits on leverage given above, may help explain observed behavior.

Moreover, as argued above in section 6.2, though individual stockholders pay taxes on dividends, these taxes do not necessarily constitute a burden on the current return to equity. Because the value of the firm may be discounted to account for the presence of the dividend tax, the tax itself does not lower the return on investment for an equity holder. This point makes Miller's original argument more realistic, for it means that the only additional taxation of equity earnings besides the corporate tax itself is the individual capital gains tax.

In summary, explanations for borrowing limitations range over tax and nontax factors. Among the latter are the potential bankruptcy and agency costs that are thought to derive from additional leverage. Among the former are the limited deductibility of additional interest payments by the corporate borrower and the offsetting tax advantages to equity at the individual level.

To test these different theories, I gathered balance sheet and income statement data for the period 1958–77 on 143 firms for which sufficient information was available about capital stock composition. All of the firms chosen listed annual investment and capital stocks separately for three categories: structures, land, and equipment.

As in the calculations described in section 6.2, the first step was to correct several book measures, such as earnings and debt. The former had to be corrected for inventory valuation and capital consumption adjustments, and the latter for deviations from market value associated with interest rate changes.

Once this was done, I used the data from all of the firms to estimate models of short-term and long-term borrowing. The models specify that there is, for each firm, a desired ratio of short-term debt to total value and long-term debt to total value. The annual borrowing decision is modeled as being one of partial adjustment, with the change in each ratio of debt to value depending on three factors: the gap between desired long-term debt and its current level, the gap between desired short-term debt and its current level, and the "cash flow" gap between current investment funds needed and the amount of funds available through retentions after a normal dividend distribution. Hence, the amount of long-term (or short-term) borrowing is hypothesized to be influenced by how much long-term debt the firm would like to add, how much short-term debt it would like to add, and how much debt overall it must add if it is not to reduce its dividend growth or issue new equity shares.

The estimated equations indicate that firms close about 44% of the gap between desired and actual long-term debt-value ratios within a year but that short-term borrowing responds more rapidly, closing over 79% of the gap between desired and actual levels within a year. Both forms of borrowing respond positively to the size of the cash flow deficit, and short-term debt appears to increase also when there is a desire for more long-term debt, indicating a degree of substitutability between the two forms of borrowing.

We turn next to the determinants of desired debt-value ratios. For both long-term and short-term debt, I estimated the impact of a number of firm characteristics. Included in this group are the tax loss carry-forward (if present), the earnings growth rate, the variance of earnings (adjusted for borrowing) around trend, and the fraction of the firm's value accounted for by land, structures, equipment, net current assets (including inventories), and goodwill, respectively. The last fraction is simply defined as the residual difference between the aggregate replacement value of the firm's assets in the other four categories and the market value of the firm itself. This is intended to measure future earnings prospects, among other things.

There are many factors estimated to affect significantly the desired debt-value ratios, but only some are consonant with the theories laid out

above. As expected, land appears to be the most heavily leveraged of all assets, and goodwill is less associated with borrowing than land, equipment, or current assets. However, for both long-term and short-term debt, the assets that are estimated to have the lowest associated debt-equity ratios are structures. This is a puzzle for which I have no ready explanation. Also puzzling is the *positive* impact on leverage of a firm's growth rate, although here it must be recalled that all of the firms studied are large, blue chip corporations. In this context, "growth company" does not have the usual connotation of being a speculative enterprise. Finally, the effects of earnings variance and tax loss carry-forwards on leverage are not especially perceptible.

Thus, the results offer no support for the proposition that companies investing primarily in structures borrow more than companies investing in equipment, though land does seem to have greater associated borrowing. The separation between real and financial decisions does not appear to hold, but no combination of the theories reviewed above is sufficient to explain this borrowing pattern completely. Hence, it is difficult to know how to bring the tax advantage to debt into calculations of overall tax incentives facing investments of different types, though it appears there is a substantial tax advantage to investing in equipment rather than structures.

6.6 Conclusions

I have discussed in each of the sections above how the impact of the corporate tax is difficult to measure from observed revenue figures alone. It will be useful to summarize them here.

First, the existence of "double taxation" of dividends is highly questionable. The payment of dividend taxes does not mean that these taxes affect the returns to current investors, because the taxes will already be reflected in the firm's market value via a discount relative to the intrinsic value of the firm's assets. Second, investment incentives defer tax payments by corporations, so that income from newer assets is taxed less heavily than that from older assets. This makes aggregate corporate tax payments meaningless as economic indicators. Because of the relatively bigger tax shield offered by new investments, older assets will carry a discount in the determination of a corporation's market value, leading to a second tax-associated cause for the presence of a discount in the value of corporate equity.

The riskiness of corporate investments combined with the asymmetry of the corporate tax in its treatment of gains and losses means that the corporation's incentive to invest depends on its tax status. Given the negative accrued tax liabilities in the early years after an investment is made, associated with investment tax credits and accelerated depreciation, the incen-

tive to invest is greater for a firm that is currently taxable than for a firm that is not.

Finally, the financial decision, if not made separately from the real investment decision, may influence the investment choice among various assets. Observed behavior indicates that financial and real decisions are related, but not strictly according to any pattern predicted by prevailing theories.

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