EFFECTS OF THE TAX REFORM ACT OF 1986 ON CORPORATE FINANCIAL POLICY
AND ORGANIZATIONAL FORM

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ABSTRACT

We examine the effects of the Tax Reform Act of 1986 on the financial decisions made by firms. We review the theory and empirical predictions of prior literature for corporate debt policy, for dividend and equity repurchase payouts to shareholders, and for the choice of organizational form. We then compare the predictions to post-1986 experience. The change in debt/value ratios has been substantially smaller than expected. Dividend payouts increased as predicted, but stock repurchases increased even more rapidly which was unexpected and is difficult to understand. Based on very scant data, it appears that some activities have shuffled among organizational forms; in particular, loss activities may have been moved into corporate form where they are deducted at a higher tax rate, while gain activities may have shifted towards noncorporate form, to be taxed at the lower personal rates. In addition, several interesting new issues are raised. One concerns previously neglected implications for the effective tax on retained earnings that follow from optimal trading strategies when long- and short-term capital gains are taxed at different rates. Also, new interest allocation rules for multinational corporations provide a substantial incentive for many firms to shift their borrowing abroad.

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The Tax Reform Act of 1986 (hereafter TRA86) included the most extensive changes in the U.S. tax law since the dramatic increase in corporate and personal tax rates during World War II. For many years tax economists have found that it is difficult to estimate the effect of taxes on corporate behavior because there has been so little variation in corporate tax policy. The major changes introduced by the TRA86 offer an opportunity to assess how well previous analyses succeeded in predicting the effects of tax changes, and an opportunity to obtain new understanding about taxes and corporate behavior.

The objective of this paper is to examine the effects of the tax reform on the financial decisions made by firms. Taking as given its real decisions, a firm has substantial flexibility in deciding on the source of finance for its operations, and even on the legal form of ownership. To begin with, corporations can finance themselves through both debt and equity. Additional equity finance can be obtained either through retained earnings or through new share issues. When payments get made to equity holders, they can take the form of dividends or share repurchases. Shares of other firms as well as of one's own firm can be repurchased. More fundamentally, a firm need not necessarily set itself up as a corporation for both legal and tax purposes. By becoming a subchaper S corporation, its income is taxed solely under the personal income tax, even though it retains many of the others benefits of the corporate form of organization. In addition, it can become a partnership or proprietorship for tax or legal reasons.[1]

Past work has presumed that taxes play an important role in these decisions. If so, then the extensive changes in the tax law that were enacted in 1986 should have led to

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[1] Firms can make choices about organizational form when they are first formed, but later in life they can also choose to shift between one form and another, with some costs.

noticeable changes in these decisions. What was forecasted and what happened?

In section 1, we focus on a corporation's decision to use debt *vs.* equity finance. We present various theoretical models that have been developed to describe a firm's decisions, then use the models to forecast what should have happened as a result of the 1986 t‑ ‑ reform. We find that the actual change in debt/value ratios has been substantially smaller than the models predict. We discuss some reasons for the surprise. In addition, we raise some new issues, including the implications for the effective tax on retained earnings that follow from optimal trading strategies, and the incentives provided by the new interest allocation rules for multinational corporations to shift their borrowing abroad.

Section 2 then examines the decision to pay dividends *vs.* use the same funds to reduce new share issues or to repurchase existing shares of one's own firm or of other firms. Finally, section 3 examines the choice of organizational form. Results are summarized briefly in section 4.

1. DEBT *VS.* EQUITY FINANCE

A. Forecasts from the traditional theory

During the last decade, there have been a variety of approaches in the theoretical literature to the determinants of a corporation's debt–equity ratio. To begin with, Miller–Modigliani (1961) emphasized that interest payments but not dividends are deductible under the corporate income tax, implying that a shift of a dollar from equity to debt finance lowers corporate tax payments each year by τi, where τ is the corporate tax rate and i is the nominal interest rate. This tax savings from additional use of corporate debt would be traded off with the increased risk of costly bankruptcy that results. As the literature developed, real bankruptcy costs included not only administrative costs,[2] but also a variety of extra monitoring and agency costs arising from the conflicts of interest between different classes of creditors in bankruptcy, and even in anticipation of the possibility of bankruptcy.[3]

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[2] Warner (1977) presented data indicating that these were small.

[3] See, for example, Myers (1977), Jensen and Meckling (1976), Bulow and Shoven (1978), and White (1980, 1989).

Suppose the additional costs that arise from the marginal dollar of debt can be expressed as a general function of the existing debt–value ratio, $C(D/V)$, where $C(\cdot)$ is assumed to be increasing in D/V. If the firm adds debt until the extra tax savings are just offset at the margin by extra bankruptcy costs, then in equilibrium $\tau i = C(D/V)$.

Miller (1977) pointed out that this model entirely ignores personal taxes. Yet, under the personal income tax nominal income from debt (interest payments) is entirely taxed at ordinary rates, while nominal income from equity consists not only of dividends, which are also taxed at ordinary rates,[4] but also of capital gains, which are not. Capital gains are taxed only when the asset is sold, allowing a gain from deferral of tax payments. In addition, prior to the TRA86 capital gains were taxed at only forty percent of the ordinary rate if the asset had been owned for over six months and were entirely tax exempt if the asset were held until death.[5] The less favorable tax treatment of debt income under the personal income tax offset to some degree the more favorable tax treatment of debt under the corporate income tax.

To understand the implications of taking personal taxes into account, let t represent the ordinary tax rate of the marginal investor in corporate debt, and let e represent the net taxes on a dollar of income to equity, received in some combination of dividends and capital gains.[6] If a firm owns an asset earning i before tax, and finances this asset by debt, then no corporate taxes are due on the resulting net income, but personal tax liabilities equal ti. In contrast, if the asset were financed with equity, corporate tax liabilities would be τi, leaving net of corporate tax income of $(1-\tau)i$ received by equity holders. They pay a tax at rate e on this income, implying total tax payments of $(\tau + (1-\tau)e)i$ under equity finance.[7] If additional debt is used to finance the firm until the tax savings that result are

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[4] In fact, prior to the TRA86, the first \$100 in dividends received by an individual were tax-free. Since virtually all dividends are received by shareholders with more than \$100 in dividend income, this provision should have no effect on marginal tax rates.

[5] Prior to July, 1984 the holding period for long-term gains was one year, and prior to October, 1979, the long-term rate was fifty percent of the ordinary income tax rate.

[6] For capital gains, we use the accrual equivalent tax rate, rather than taxes currently paid.

[7] If the asset earned more than i, with the additional income accruing to the original equity holders, then the same amount of taxes would be paid on the additional income, regardless of the choice of debt vs. equity finance at the margin.

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just offset at the margin by additional bankruptcy costs, then in equilibrium[8]

$$(\tau + (1 - \tau)e - t)i = C(D/V). \tag{1}$$

In order to summarize the incentives to use debt finance under the tax law immediately prior to the 1986 reform, each of these tax parameters must be measured. Consider first the marginal effective tax rate on income at the corporate level. During this period, corporations with substantial income faced a statutory tax rate equal to .46. Corporations with losses were allowed to use these losses to offset any profits earned during the previous three years, or profits they may earn during the following fifteen years. In addition, corporations with taxable income below $100,000 in a year faced lower statutory corporate tax rates. Furthermore, the effective marginal tax rate was reduced by the limitation on use of the investment tax credit to 85% of tax payments.[9] Using time-series data available internally at the Treasury, Altshuler and Auerbach (1990) calculated that on average the corporate tax rate that applied to interest deductions was only .318 during the early 1980's.

Measuring the ordinary tax rate faced by the "marginal investor" in corporate debt is even more difficult since investors in many different tax brackets invest in bonds. Gordon and Bradford (1980) show that the tax rate on interest income embedded in the market's evaluation of bonds is a weighted average of the marginal tax rates of all investors active in the bond market. One possible approach to measure this weighted average of marginal tax rates is to compare the interest rates on taxable and tax-exempt bonds that otherwise have similar characteristics. Poterba (1989) compares the yield on long-term Treasury bonds to state and local municipal bonds and finds that the average t over 1981–1985 is 0.202.[10]

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[8] See Gordon (1982) for a formal derivation.

[9] Given this limitation, tax payments equal $\tau Y - \min(.85\tau Y, C)$, where Y equals taxable income, and C equals the amount of investment tax credits. The marginal tax rate in a given year drops to $.15\tau$ when the limitation on investment tax credits is binding. Carryover of credits complicates this calculation, however.

[10] Gordon and Malkiel (1981) compare the yields on taxable and tax-exempt bonds issued simultaneously by the same corporation by looking at firms that issued tax-exempt industrial revenue bonds (IRBs) along with ordinary bonds with the same nontax provisions. This alternative approach ensures that the comparison holds everything other than tax status constant. They estimated t to be 0.225 in 1978. The TRA86 restricted the use of IRBs for private investment, so we cannot use this superior method to estimate the implicit tax rate post-TRA86. We thus rely on Poterba's approach, which he does use to estimate t for 1987–8.

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We now estimate the marginal tax rate on equity income. If the fraction d of the nominal income accruing to equity holders takes the form of dividends, and capital gains are always realized long-term, then $e = dt + (1-d)g\alpha t$. Here, g measures the fraction of long-term gains which are taxable implying that $g = .4$ prior to 1986, while α is intended to capture the benefits from deferring the payment of accruing tax liabilities on capital gains until the asset is sold, and the benefits of being exempted from tax on gains on assets still held at death. The conventional assumption in the literature has been to assume that the effective tax rate on capital gains is halved due to deferral, and halved again due to the exemption at death, implying that $\alpha \approx .25$.[11]

We estimate d by taking the average ratio of aggregate corporate dividend payments to after-tax corporate profits during 1984 through 1986, as reported in the National Income and Product Accounts, which equals .560.[12] Given these parameter values, $\tau + (1-\tau)e - t = .199$.[13] Therefore, \$.199 more is paid in taxes on a dollar of pre-tax corporate income if this income belongs entirely to equityholders than if it belongs entirely to debtholders.

What would have happened to the tax incentive to use debt under the TRA86, as calculated using this traditional approach? Many incentives changed under the TRA86. To begin with, the maximum statutory tax rate was cut from 46% in 1986 to 40% in 1987 and 34% in 1988 and thereafter. This rate now applies to income over \$75,000, rather than \$100,000, so fewer firms are likely to face the lower bracket rate. In addition, the likelihood that a corporation will have tax losses has fallen due to the reduction in initial depreciation allowances on purchases of new physical capital.[14] The repeal of the investment tax credit

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[11] See, for example, Feldstein, Dicks–Mireaux, and Poterba (1983).

[12] After-tax corporate profits include the inventory valuation adjustment and the capital consumption adjustment. We exclude financial sector firms throughout the paper.

[13] Miller (1977) argued that in equilibrium t would adjust until this expression equaled zero, while DeAngelo–Masulis (1980) argued that τ should adjust until in equilibrium this expression equaled zero. Rather than relying on their theoretical results, which depend on the assumption that marginal bankruptcy costs are zero, we used the best empirical estimates we could find for each parameter.

[14] For a sample of approximately 1400 firms with complete data in Compustat, average loss carryforwards have fallen since 1986 from about 30% of net sales to 8% in 1988, even though after-tax corporate profits have fallen during this same period from \$191 billion to \$186 billion according to the *Survey of Current Business* (Table 1.16), July 1989.

also eliminates the effect of the limitation on allowed tax credits, which had lowered the effective marginal tax rate.

All of these changes raise the fraction of corporate income taxable at the maximum rate. However, the TRA86 also increased the importance of the alternative minimum tax. Companies paying the alternative minimum tax face a marginal tax rate of 20%. Some of the companies paying the alternative minimum tax may otherwise have faced a lower marginal rate, due to the effects of tax losses and progressivity in the rate schedule, but some may otherwise have faced a 34% marginal tax rate. Without access to confidential tax returns we cannot redo the calculations reported in Altshuler and Auerbach (1990) for post–1986 data, and thus simply assumed that the average corporate tax rate that applied to interest deductions during 1987–8 was 85% of the maximum statutory rate, rather than 69.2%, as found during the early 1980's by Altshuler and Auerbach.

The cut in personal tax rates in 1986 should also have reduced t. Using municipal bond return data, Poterba (1989) implicitly estimates that the personal tax rate on the marginal investor in taxable bonds was 19% in 1987, and 15.5% in 1988. In addition, individuals could no longer exclude the first $100 in dividend income, though for the most part this should not affect marginal incentives.

The remaining parameters to be estimated are d, α, and g. Using the estimated equation for dividends in Poterba (1987), we forecast that the TRA86 should increase the dividend payout rate by 12.3% in 1987 and by another 4.7% in 1988, raising d from .588 to .711 and .758 in 1987 and 1988 respectively.[15] In addition, long–term gains became fully taxable, so $g = 1.0$. While the timing of realizations is likely to change under the new law, we initially maintain the conventional assumption that $\alpha = 0.25$.

We have collected our calculations in Table 1. According to the discussion above, the tax rate (corporate and personal) on equity is $\tau + (1 - \tau)e$, while the tax rate (personal only) on debt is t. Comparing 1988 to 1986 shows that the tax rate on income to debt is estimated to fall from .202 to .155, while the tax rate on income to equity falls only

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[15] We report increases in the dividend payout rate relative to 1986 values. However, to calculate the pre-TRA86 tax incentive for debt above, we used the average value for 1984–1986.

from .401 to .379, implying a net increase in the tax advantage of debt from .199 to .224. Therefore, the TRA86 provided some incentive to increase debt financing.

Why does debt look more attractive? The estimated magnitude of the fall in the tax cost of debt is not surprising, given the general drop in both personal and corporate statutory tax rates.[16] Why did the tax cost of equity fall by less? There are two factors at play here. First, the estimated personal tax rate on equity income is estimated to increase slightly from .122 to .127. Although personal tax rates were cut, Poterba forecasts that more equity income will be in the form of dividends, which remain more highly taxed than capital gains (because capital gains taxes are still deferred until realization or forgiven at death). The shift from capital gains to dividends more than compensates for the decrease in the tax rate on the marginal investor's income.

The second factor in the tax cost of equity is the effective corporate tax rate. We believe that the fall in this rate was also relatively small (from .318 to .289) despite the deeper cut in statutory rates (from .46 to .34) because of the simultaneous changes in depreciation and investment tax credits. With a broader tax base and no credits firms will be less likely to face a zero tax rate (tax exhaustion). The statutory rate fell, but the likelihood of actually paying that tax rate increased, with the net effect that the expected corporate tax rate did not fall by much.

Thus, offsetting changes in the corporate tax rules and in the composition of equity income should limit the change in the tax cost of equity, while the debt cost appears to have fallen more substantially. The combined effect is for firms to have a higher incentive to borrow.

What effect should this change in incentives have on the average corporate debt–value ratio? To our knowledge, no one has attempted to estimate directly the relationship between the debt incentive of equation (1) and firm debt ratios. There are two reasons why such studies have not been feasible. First, there has been very little time-series variation in many of the tax parameters during the period since World War II. Second, it is difficult to measure accurately many of the tax parameters, as evidenced by the work of

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[16] Financial intermediaries are important investors in bonds, implying that changes in corporate tax rates can also affect the tax rate on debt.

Altshuler and Auerbach (1990). As a result, many authors have attempted to estimate the effect of various partial proxies for the effective marginal tax advantage of debt on debt ratios. Typical proxies with sufficient time-series variation include depreciation deductions, loss carryforwards, and investment tax credits.[17] However, most of these studies have not carefully specified the relationship between the proxies and the marginal tax advantage of debt, and in fact many of them have obtained estimated coefficients that have the wrong sign according to the theory.[18] Thus it would be very difficult to use these estimates to forecast the effects of the 1986 tax changes.

Another approach was taken by Gordon (1982), who tested the sensitivity of debt–value ratios to changes in market interest rates, through running a regression of the form $D/V = b_0 + b_1 i + \ldots$ using time-series data. As seen in equation (1), the incentive to use debt should instead be a function of the product of the market interest rate and a tax term. However, if the tax term were unchanging during the sample period, then the debt–value ratio is simply a function of the market interest rate, and we can interpret b_1 as equalling $b_1^*(\tau + e(1 - \tau) - t)$. The specification then implies that b_1^* should remain constant over time, even if tax rates do change. We therefore assume that the tax incentive term had been constant during the sample period 1956-80 at our estimated 1986 value of .199. We then infer from the estimated parameters that the debt–value ratio should have increased by .234 from 1986 to 1987, but only by .155 from 1986 to 1988, due to both the changes in the tax law and the observed increase in market interest rates.

MacKie-Mason (1989, 1990) takes a different approach to studying the determinants of financing decisions. Rather than estimate models of firm debt/value ratios, these papers study incremental choices; the first considers the choice between stock and bonds when a firm publicly issues securities, and the second considers the choice between private and public sources of funds. The econometric results indicate that the public debt–equity choice depends significantly on implicit variation in a firm's effective marginal tax rate. Specifically, if a firm has high non-debt tax shields (loss carryforwards and investment tax

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[17] Examples include Titman and Wessels (1988); Ang and Peterson (1986); Auerbach (1985); Bradley, Jarrell and Kim (1984); Long and Malitz (1985).

[18] MacKie-Mason (1990) discusses these problems in more detail.

credits) when it is near tax-exhaustion, then those shields have a substantial probability of crowding out interest deductions on new debt, and the first study finds that those firms are less likely to issue bonds. In essence, the analysis uses publicly available information to identify those firms likely to have a low expected marginal corporate tax rate, and then estimates the difference in debt–equity choices for those firms.

We have used the estimates in MacKie-Mason (1990) to forecast the ratio of new debt issues to equity issues after the tax reform. We first calculated the predicted fraction of debt issues in 1987 and 1988 using the observed values for firm characteristics. We then attempt to forecast what the fraction of debt issues would have been if there had been no tax reform. To do this we used the following method to estimate what loss carryforwards and ITC would have been. We assumed that ITC would have been the same fraction of new capital expenditures as in 1985,[19] and that tax loss carryforwards would remain unchanged in 1987 and 1988 from its previous value.[20] The results are shown in Table 2. The forecast is that the effect of the TRA86 on the fraction of new issues that are debt rather than equity should be an increase in the debt share of .02 in 1987 and .06 in 1988. Without the TRA86, debt issues in 1987 are forecast to increase over 1986 by 8%, but then fall by 11% from 1987 to 1988, due to variation in other factors.

We shall return in Section 1.E to compare the forecasts with actual financing practices in 1987 and 1988. We now continue our survey of theory and forecasts, considering some elaborations on the theory presented above, some new issues raised by the TRA86, and some alternative theories.

B. Further elaborations on the traditional model

In the above discussion, we assumed that the costs of extra debt, as measured by the function $C(D/V)$, do not change as a result of the Tax Reform Act. These costs are presumed to arise primarily as a result of the conflicts of interest between debt and equity holders, giving the firm the incentive to make value-reducing decisions that aid equity

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[19] We use 1985 as the base year because the repeal of ITC was retroactive to January 1, 1986.

[20] Alternative assumptions about TLCF made no difference to the forecasts.

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holders at the expense of debt holders and leading debt holders in response to spend resources monitoring the firm. To the degree to which debt holders and equity holders are the same people, however, this conflict of interests is reduced since redistribution among securities no longer implies redistribution among investors. Under the tax law prior to 1986, portfolio holdings were highly segmented, with interest-bearing assets held by individuals and institutions in low or zero tax brackets and equity held by those in high tax brackets — those in high tax brackets benefited much more from the favorable treatment of capital gains on equity.[21] As a result of the TRA86, however, the tax benefit of capital gains was substantially reduced, reducing tax distortions to portfolio choice. If portfolios become more balanced, conflicts of interest between debt holders and equity holders should become less important. As a result, the costs of extra debt are less (the function $C(D/V)$ shifts downward) and use of debt should increase by more than forecast using the above model.[22]

Another weakness of the traditional theory is its naive treatment of capital gains. Recent research on optimal trading strategies suggests that the effects of the tax treatment of capital gains can be far more complicated than presumed in the above discussion.[23] The effective tax rate on additional retentions depends heavily on the trading strategies followed by investors. For example, under both the old and the new laws, investors would have the incentive to sell immediately securities that have dropped in price in order to claim the tax loss without delay. In addition, calculations reported by Constantinides (1984) suggest that under the old law investors also had the incentive to sell gains as soon as they become long-term, rather than holding gains to defer the capital gains tax. By selling as soon as gains become long-term and then reinvesting, the investor acquired the right to realize any drop in price during the following year as a short-term loss, a right that was valuable enough that it paid to realize the long-term gain. If investors did follow this strategy of

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[21] For evidence on portfolio holdings see, for example, King and Leape (1984). Note, however, that if equity is owned directly by investors in high tax brackets, but corporate bonds are owned by corporate defined-benefit pension funds, where the corporation is the residual claimant on the assets, then the income from both the equity and the debt accrue to those in high tax brackets.

[22] For further discussion, see Gordon (1989).

[23] See, for example, Constantinides (1984) and Stiglitz (1983).

selling losses short-term and gains just after they became long-term, so that all securities were turned over each year, then the *ex ante* expected increase in capital gains taxes when a firm retains an extra dollar would be $t\beta + .4t(1 - \beta)$, where β is the probability that the value of the firm falls during the year.[24] Under this trading rule, the value of α should be $1 + 1.5\beta$, rather than 0.25 as assumed above.[25] For a variety of reasons, actual trading strategies are likely to involve much less trade, implying a lower value of α, but not necessarily one close to 0.25.

Under the Tax Reform Act of 1986, long-term capital gains are no longer taxed at a lower rate, eliminating the attractiveness of selling gains. The optimal trading strategy now becomes selling losses and holding gains.[26] The change in trading strategy implies a drop in α after 1986. How large a drop is difficult to judge, but any drop makes equity more attractive. Suppose for instance that the correct value for α pre-TRA86 was .50 but that the value then dropped to .25 after the reform. Then the forecasted change in D/V between 1986 and 1988 decreases from .155, the value calculated above, to .127.

C. New issues raised by the Tax Reform Act of 1986

The Tax Reform Act of 1986 included several new provisions not present in previous legislation, which could also affect corporate debt–equity ratios. Understandably, previous theories did not examine the effects of such provisions. The first provision restricts interest deductions on Schedule A under the personal income tax to mortgage interest on a first or second house, and investment interest up to the amount of investment income. The

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[24] One omitted complication is that the tax law forces individuals to use long-term capital gains to offset short-term capital losses, with only the *net* loss deductible. Another is that only $3000 in net losses can be deducted from other income. Some ways to relax these constraints are discussed in Stiglitz (1983).

[25] The value of α is the factor that converts the capital gains tax rate on long-term gains, gt, into an accrual-equivalent tax rate. The factor is greater than one with frequent trading because incremental retained earnings in gain years are taxed at gt, but retentions in loss years are taxed at the full personal rate, t.

[26] In addition, the probability of experiencing a capital loss on a particular asset would change due to changes in debt–equity ratios, changes in dividend payout rates, and the change in trading strategy. Trading strategy matters because of the longer holding period for gains. The conditional probability of an asset experiencing a capital loss—a drop in price below the original basis—falls the longer the asset is held as long as the asset has a positive expected nominal rate of return.

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deductibility of consumer interest payments (except those related to a business) is being phased out during 1987–90. What should the effects of these provisions be?

To begin with, individuals have the incentive to convert nonmortage debt into mortgage debt, thereby making the interest payments deductible, or alternatively to use any holdings of taxable bonds to repay nonmortgage debt. As long as an individual's total net debt had been less than the allowed amount of mortgage debt under the statute, then this conversion is feasible and should be the only effect of the new provision.[27] To the extent that there are transactions costs from this conversion, the net tax effect can be no larger than these transactions costs.

What happens if the individual's total net debt had been greater than the allowed amount of mortgage debt?[28] This is most likely to occur for the wealthiest individuals who for tax reasons have had the incentive to borrow heavily and invest the funds in more lightly-taxed assets such as corporate equity. These individuals would prefer borrowing by the corporations in which they own shares to personal borrowing. At the margin, they face a tax rate on interest income of $t = 0$, so that equation (1) implies a very strong incentive for corporations to make increased use of debt finance.[29] As in the proof of the Modigliani and Miller (1958) theorem, corporate borrowing replaces individual borrowing. In particular, corporations can borrow to repurchase the shares of these individuals, who then use the proceeds to repay their excess debt.

In Table 3 we present some evidence on personal borrowing patterns. There was a dramatic increase in mortgage borrowing in 1986 and 1987, as expected. Mortgage borrowing has fallen off in 1988 and the first quarter of 1989, but the level is still substantially higher than it was pre-TRA86. Consumer credit reached its peak during 1984–85, and fell off considerably from 1986 on. Thus, it appears that there was significant substitution from

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[27] Of course, the individual must also hold enough home equity to secure the necessary mortgage debt. Manchester and Poterba (1989) estimate that there was a potential stock of $2.5 trillion in unused mortgage borrowing in 1985, and that if the $100,000 limit on tax-deductible second mortgage debt had been in place only 10.5% of homeowners would have been constrained.

[28] "Net" debt does not include debt used to finance portfolio investments, since interest on this debt is still deductible.

[29] Feldstein (1989) also makes this argument about the effects of the limitation of interest deductions on corporate borrowing.

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consumer credit to mortgage borrowing. In addition, total borrowing had been increasing almost linearly from 1980–1986 but fell well below the trend line after the TRA86.

The aggregate flows in Table 3 are for all individuals in the U.S., but the interest deduction provisions of the TRA86 affect only those individuals who itemize. Most individuals with mortgages are itemizers, but many who use consumer credit are not, and nonitemizers faced no change in the tax cost of borrowing. The other part of Table 3 reports preliminary data on interest deductions claimed by itemizers during 1986–88. Mortgage interest paid by itemizers has steadily increased, while consumer interest paid by itemizers (i.e., deductions grossed up by the fraction that is deductible under the new law) has fallen significantly. The ratio of nonmortgage to mortgage interest for itemizers has fallen from 59% in 1986 to 45% in 1988.[30]

A related provision of the new law limited the tax deductibility of losses arising from "passive" investments such as shares in a limited partnership or income from rental housing.[31] These losses arise in part because of the deduction of interest payments on debt incurred as part of the business activity. Again, these individuals could attempt to substitute mortgage debt for the passive business debt. If this is not feasible, however, then they would face a reduced marginal tax rate on income from these passive activities. For passive investments undertaken after October, 1986 that incur net tax losses, the marginal tax rate is zero. For earlier passive investments that have losses, phase–in rules allow some fraction of these losses to be deducted from taxable income. Simple calculations suggest that the marginal tax rate on this income is approximately $.825t$ in 1987 and $.5t$ in 1988.[32] If these individuals are also corporate shareholders, they would again have an increased incentive to substitute corporate borrowing for personal borrowing due to the drop in the personal tax rate applying to interest deductions. This new provision therefore should also increase corporate incentives to issue debt.

[30] See the paper by Feenberg and Skinner in this volume for further evidence on shifts from consumer credit to mortgage borrowing.

[31] Note that aggregate partnership income reported on individual returns has been negative since 1981.

[32] Under the phase–in rules, 65% of the losses in 1987 could be deducted, 40% of the losses in 1988, 20% of those in 1989, and 10% of those in 1990. The figures in the text use these rules, but take into account the benefit of carryover of losses disallowed in·an earlier year assuming a 10% discount rate.

A third provision in the new law requires that affiliated corporations eligible to file a consolidated return allocate worldwide interest deductions across the various companies in proportion to their assets to determine domestic and foreign source income. Previously, an affiliated group could calculate income separately for each company, allowing it to allocate interest deductions to particular firms in order to minimize total tax payments by the group. As long as most other countries continue to follow the previous accounting practice, there will be complicated interactions between the provisions in different countries. In fact, the rules may have a "beggar-thy-neighbor" effect, by increasing tax payments to the U.S. at the expense of tax payments to foreign governments.

Consider the following example. In the simplest terms, a U.S. firm with foreign branch operations pays a total tax bill consisting of foreign taxes plus pre-credit U.S. taxes minus foreign tax credits:

$$\tau_f y_f^f + \tau_u(y_u^u + y_f^u) - \min[\tau_f y_f^f, \tau_u y_f^u]$$

where τ_i is the tax rate in country i with f the foreign country and u the U.S.; and y_i^j is source income in country i as defined by country $j's$ tax law. Suppose a U.S. multinational has domestic capital K_u, and foreign branch capital K_f, and increases borrowing enough to make additional interest payments of i. U.S. pre-credit tax payments fall by $\tau_u i$ regardless of where the borrowing takes place since tax is levied on worldwide income. If the firm has excess foreign tax credits $(\tau_u y_f^u < \tau_f y_f^f)$ then the foreign tax credit falls by $\tau_u i(K_f/(K_u + K_f))$ under the new interest allocation rules, again regardless of the location of the borrowing. However, foreign tax payments may depend on the borrowing location: with a source-based deduction, foreign taxes fall by $\tau_f i$ only when the borrowing is done abroad. Thus, a multinational with excess foreign tax credits and foreign branch operations will reduce its total tax liability by doing all borrowing abroad. In contrast, if the firm does not have excess foreign tax credits then the location of the interest deductions does not affect total tax payments.[33]

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[33] If foreign governments do adopt the same tax provision for the allocation of interest deductions, then the location of the interest deduction becomes irrelevant, but the effective corporate tax rate applied to interest deductions becomes $(K_f \tau_f + K_u \tau_u)/(K_f + K_u)$, which is simply a weighted average of the foreign and domestic tax rates, rather than τ_u as assumed above.

D. Other theories of corporate financial policy

In response to the poor performance of empirical tests of the traditional model of corporate financial policy used above, Myers and Majluf (1984) developed an alternative model, focusing on the conflicts of interest between existing equity holders and new creditors (both equity and debt). They argued that a firm's manager has better information about the true value of the existing firm than the market does, and wants to use this information to the advantage of existing equity holders. As a result, the manager may issue new shares either because the market overestimates the true value per share or because the firm in fact needs further funds to finance valuable new investment projects. Investors therefore must react cautiously when the firm issues new securities since the fact that the firm chooses to make the new issue suggests that the firm's share price may be too high. This caution makes it more expensive for the firm to go to the market for new funds, and more so for new equity than for new debt since the return on equity is much more sensitive to the true value of the firm. Myers and Majluf then conclude that the firm would always prefer to issue debt rather than equity, and would find internal finance preferable (if available) to outside finance.[34] Firms may also concentrate their issues of new securities during periods in which the market is relatively well informed about the situation of the firm, thereby lessening the need for caution on the part of purchasers of these new issues.

The theory did not directly focus on tax effects. It would appear that taxes reinforce the firm's preference for new debt issues over new equity issues, but create an incentive to issue new debt even when internal finance is available for needed projects.

What would the Tax Reform Act of 1986 do to corporate financial policy according to this theory? Under the reform, corporate tax payments went up, at least during the first few years. As a result, the internal funds available for new investment projects drop. Firms therefore would be forced to seek outside finance more frequently, where outside finance normally takes the form of debt. Therefore, debt–equity ratios should grow, at least for those firms in which internal funds are not sufficient to finance desired investment projects.

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[34] If the firm cannot issue new debt, due perhaps to credit rationing as described by Stiglitz and Weiss (1981), then it may choose to issue new equity.

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E. Evidence on debt–equity ratios after the reforms

What in fact happened to debt–value ratios in response to the TRA86? Table 4 reports figures calculated from the balance sheet data of 996 firms on the Compustat tape.[35] The first row reports debt/value ratios from 1985–8, using data on book debt and the market value of equity. Here, we find that debt/value ratios did increase, as forecast, but that the increase was only .041 from 1986 to 1988, in contrast to the forecasted increase of .155.[36]

Why might the theory have forecast a much larger change than in fact was observed? One possible explanation is that the adjustment of corporate capital structure is a costly process that is likely to occur gradually. Auerbach (1985) makes a simple attempt to model dynamics, and finds that only 27.4% of the adjustment takes place each year, implying that 52.7% of the adjustment should have taken place after two years. This would imply a long run increase in D/V of only .078, which still seems very small.

A second possible explanation is that some of our tax parameters are estimated poorly, leading us to overestimate the size of the tax change. For example, our estimate of the effective corporate tax rate in 1986 was based heavily on calculations by Altshuler and Auerbach for the early 1980's, when the state of the economy was much different,[37] while our estimate for the corporate tax after 1986 was simply a guess. Had the ratio between the effective and the statutory corporate tax rates not changed as a result of the TRA86, then debt-value ratios would have been forecast to decrease.[38] To explore the possible importance of this explanation, we compared what happened to firms that were more or less likely to face a lower effective corporate tax rate. In particular, we compared firms

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[35] We only selected firms from the Primary, Secondary and Tertiary tape, so our sample is biased towards large firms. Our selection criteria were that the firms be nonfinancial, and that they have complete data for all of the variables in each comparison. Book debt is the sum of short- and long-term, and the market value of equity is measured using the price on the last trading day of the year.

[36] The debt/value rations for our sample are very similar to the values for the entire nonfinancial corporate sector as reported by the Federal Reserve — .24 in 1985, and .29 in 1988 (*Balance Sheets for the U.S. Economy*, April 1989) — so our reliance on a sample does not appear to introduce important bias.

[37] For instance, the importance of tax loss carryforwards was likely much higher during the middle of a deep recession in the early 1980's than in 1986, after several years of relative prosperity.

[38] For example, if the ratio of the effective to the statutory tax rate remained equal to the Altshuler and Auerbach estimate for the early 1980s, then the tax incentive favoring debt would drop from .199 in 1986 to .177 in 1988.

whose ITC credits in 1986, as a fraction of after–tax profits, were below *vs.* above the median value for firms in the sample. Those with large ITC's were more likely to face a binding restriction on credits in 1986, reducing their effective corporate tax rate then but not (to the same degree) in 1988. As a result, they should have increased their debt/value ratios more in response to the tax change, and this is indeed what we find. Even for those with larger ITC's in 1986, however, who should have faced a time pattern of tax rates similar to those used in our calculations, the observed increase in use of debt was small relative to the forecasts.

Similarly, little is known about the effective capital gains tax rate, given its heavy dependence on trading strategies which themselves are affected by the tax law. We showed above that the forecasted change in D/V was sensitive to the assumptions made about the values of α before and after the reform. Before the reform, more trade should have occurred due to the favored treatment of capital gains. This raises the effective tax rate on retained earnings, making debt finance more attractive. Perhaps we underestimated the magnitude of the change in trading strategies brought about by the tax reform, causing us to overestimate the increased tax incentive to issue debt. To test the plausibility of this explanation, we would need data before and after the reform on the fraction of shares sold each year, both long-term and short-term, but such data are not currently available.

In addition, the above calculations assumed a closed economy. Yet corporate securities are increasingly being purchased by foreign investors. Equity is no longer as favored under the U.S. personal income tax, due to the increased tax rate on capital gains and the general reduction in the importance of taxes due to the drop in tax rates,[39] but barring similar changes in foreign tax laws, foreign holding of U.S. equities should remain as favored as before.[40] We would therefore forecast an international shift in portfolios, with foreigners increasingly owning the equity in U.S. firms, implying on net a smaller drop in the personal tax advantage of equity after 1986. As a result, debt/value ratios should not have increased

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[39] According to our figures in Table 1, the difference in the personal tax rates on income from debt *vs.* equity had been $(.202 - .122) = .08$ in 1986, but only $(.155 - .127) = .028$ in 1988.

[40] As Whalley shows elsewhere in this volume, many other countries have also recently revised their tax systems, usually in a manner similar to the U.S. tax reform. Thus, U.S. equity may now also be less favored in other countries.

by as much as was previously forecast, assuming a closed economy. How important this effect should be is hard to judge. Was there any observable shift toward foreign ownership of the equity in U.S. firms? Scholes and Wolfson (1988) report a large and sustained increase in foreign acquisisions of U.S. firms starting in the fourth quarter of 1986. International portfolio shifts may therefore be part of the explanation for the small change in debt/value ratios.

A third explanation would appeal to some of the other complications discussed in Section 1.C. Some would have led us to forecast an even larger increase in D/V, so do not help directly in explaining the smaller than expected increase. One complication that does lead to a reduced forecast of D/V is the interest allocation rule for multinationals. In order to test the importance of this complication, we calculated the change in debt/value ratios for the subsample of firms that reported no foreign income tax payments, which presumably were firms unaffected by this complication.[41] For these purely domestic firms, D/V increased by .060 from 1986 to 1988, which is still small relative to the above forecasts.[42]

Perhaps the poor forecasts simply result from the limits of past empirical work on firms' responsiveness to tax incentives rather than weaknesses in the procedures used for calculating tax incentives. If so, we have learned that corporate debt policy is quite insensitive to tax incentives.

One possible direction in which to seek an explanation for the small increase in the D/V ratio is through non-tax changes in the bankruptcy and agency cost function, $C(D/V)$. If $C(D/V)$ shifted up, debt would be relatively less desirable. A number of factors may have changed bankruptcy and agency costs. For instance, the October 1987 stock market crash may have increased the perceived level of risk, leading to higher required risk premia on debt. Other factors to consider include recent institutional developments such as the emergence of a market for below-investment-grade debt ("junk" bonds), and the growth

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[41] If multinationals shift borrowing abroad in response to the new interest allocation rules then domestic debt/value ratios might decline. However, in many cases the data are reported on a consolidated basis, in which case there may be no effect on the observed D/V. Because of the data complications, we focus here only on firms with no foreign operations.

[42] However, if we also take into account Auerbach's (1985) estimated adjustment rate, the predicted long-term change is .114, which is not too far from the .155 predicted by the theory.

of leverage buyouts of firms, though the timing of these events would themselves need to be explained.

We also examined the degree to which firms that faced higher bankruptcy risk in 1985 behaved differently in response to the TRA86. These firms presumably had a higher debt/value ratio than desired in 1985, so would be trying to reduce it during the following few years, leading to a smaller increase in D/V.[43] For a bankruptcy indicator, we used 1/ZPROB, where ZPROB is a discriminant function predictor of bankruptcy estimated by Altman (1966); a high value of 1/ZPROB indicates a relatively high probability of declaring bankruptcy. We find that firms facing a higher risk of bankruptcy (high ZPINV in Table 4) did not change their debt/value ratios much in response to the TRA86, whereas firms facing little risk responded much more.[44]

We also tested the accuracy of the forecasted effects of the tax reform on the fraction of new public issues that are debt, based on the estimates in MacKie-Mason (1990). In Table 5, we report the number of new stock and bond issues from 1980 to 1988. As predicted, we observe an increase in the fraction of debt issues from 46% in 1986 to 52% and 66% in 1987 and 1988 respectively, implying an increase of 6% by 1987 and 20% by 1988. The forecasts were for 54% and 43% debt issues in 1987 and 1988. The 1987 forecast was very accurate, but 1988 was extremely underforecast. Since we don't know if the poor forecast in 1988 is due to bad estimates of the tax or other effects, it is difficult to infer whether the estimated impact of TRA86 on debt issues (an additional 2% in 1987 and 6% in 1988) is reasonable.

How do we reconcile a large shift towards debt issues with a rather small change in debt–value ratios? First, as seen in the right–hand side of Table 5, the amount of capital raised by debt *vs.* equity did not change much during the time period, due presumably

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[43] On the other hand, they should have faced a lower effective corporate tax rate in 1985, reducing their optimal debt/value ratio then, causing the forecasted change to be larger.

[44] Further results on the pattern of response across firms are available in Givoly, Hayn, Ofer, and Sarig (1989). They regress changes in debt/value ratios between 1986 and 1987 on a variety of variables. Their results agree with our inferences: different firms were affected by the reform in accordance with the standard theories of bankruptcy cost and non-debt tax shield effects. However, several of the explanatory variables in their analysis include book debt or the market value of equity, which are also in the dependent variable, so the results of their OLS regressions are likely to be biased and inconsistent. We avoid endogeneity by using 1985 values to classify the firms.

to changing relative sizes of issues. In addition, the change in the market value of equity depends not only on new issues, but also on stock repurchases, dividend payments, as well as revaluations of existing capital by the market, and book debt changes include private borrowing as well as public issues. The value of most equities rose dramatically during the first three quarters of 1987 then crashed, leaving average equity values at about the same level at the end of 1988 as at the time of the tax reform. Therefore, the revaluation effect may not be important during this period, but changes in share repurchases and dividend payout rates were important, as seen below.

One important uncontrolled factor in all of the analysis is the effect of the 1987 stock market crash on short-run financing choices.[45] Even if psychological and institutional effects do not persist in the long-run, they may have affected financing behavior substantially during 1987 and 1988, which are the only years we have data for. Casual reading of the *Wall Street Journal* suggests that the crash led to a dramatic drop in the rate of equity financing during 1988. If so, debt–value ratios would have been even lower without the crash. This only reinforces the puzzling lack of change in debt/value ratios.

2. CORPORATE DISTRIBUTIONS VIA DIVIDENDS, SHARE REPUR-CHASES, OR MERGERS

A. Traditional story

Under the tax law prior to the TRA86, most corporations faced a tax incentive to make payments to shareholders in the form of share repurchases rather than dividend payments.[46] When payouts are made via share repurchases, the distribution is taxed as a capital gain under the personal income tax, but would be taxed at ordinary rates if the payout had taken the form of a dividend payment.[47] Since at least long-term capital gains

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[45] The crash may be one reason that we underpredicted the fraction of debt issues (overpredicted equity issues) for 1988.

[46] Since new share issues are simply negative share repurchases, the theory simultaneously forecasts a tax savings from simultaneously reducing new share issues and dividend payments.

[47] In order to prevent a wholesale shift from dividend payments to share repurchases, the IRS holds that if a corporation repurchases shares at regular time intervals or proportionately from all share holders, then the capital gains that result would be taxed at ordinary rates. Corporations can easily avoid having their repurchases taxed as ordinary income, however, simply by repurchasing shares on the open market and not at regular intervals.

were taxed at a lower rate prior to the TRA86, dividend payments were discouraged by the tax law. Even when the tax rate is the same on dividends and capital gains, there would still be a tax advantage to share repurchases. Whichever form of payout occurs, shareholders are not taxed on the return of their initial investment. With share repurchases, this exemption takes the form of a deduction of the initial purchase price (basis) when each share is sold. With dividend payments, if payouts have been so large that all accumulated earnings within the firm have been paid out, then any further dividend payments are classified as "return of capital" and are untaxed. With either form of payout, the total nominal tax exemption is the same, but the exemption occurs much earlier in time when share repurchases are used.

As a result of this tax advantage to share repurchases, economists have long been puzzled why corporations pay dividends at all.[48] Attempts to explain the payment of dividends have normally assumed some nontax benefit from dividend payments that can offset the tax disadvantage of dividends. One story that has been explored in several papers is the use of dividends to signal the current profitability of the firm.[49] While these papers do not attempt to distinguish dividends from share repurchases, Gordon and Malkiel (1981) argue that dividends rather than share repurchases might be preferable as a signal because the tax disadvantage of dividends implies that in equilibrium less payout will occur, implying lower cash-flow pressure on the firm than if repurchases are used as a signal.[50] Another approach, explored in Poterba and Summers (1985), is to assume that shareholders want dividends for liquidity reasons, and liquidity is valuable enough that shareholders desire dividends in spite of the tax disadvantage. Share repurchases are less attractive than dividends since investors must spend the time and brokerage costs to sell some fraction of their shares.

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[48] Perhaps, corporations had not yet fully realized the tax benefits from shifting to share repurchase. Shoven (1987) and MacKie-Mason (1989b) report that corporations were in fact increasing their reliance on share repurchases during the early 1980's.

[49] See, for example, Bhattacharya (1979) and Miller and Rock (1985).

[50] Bernheim (1988) presents a formal model of this effect. Barclay and Smith (1987) point out that repurchases may be costly because of an adverse selection problem: repurchases may exploit superior information available to managers who hold shares at the expense of other shareholders.

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Under either story, the lower the tax rate on dividend income, the larger the amount that should be paid as dividends. Poterba (1987) estimates the sensitivity of the dividend payout rate to the tax treatment of dividends using a simple time-series model with a dynamic structure. From his estimates we forecast that the TRA86 should have resulted in an 8.5% increase in corporate dividends in 1987 and an additional 10.8% increase in 1988.[51]

B. Alternative story of dividends

An alternative approach to explaining dividend payments, known as the "new view," appears in Auerbach (1979), Bradford (1981), and King (1977). These papers assume that a corporation cannot in fact repurchase shares. Either it pays dividends or else it reinvests the funds in new physical capital, resulting in capital gains to shareholders.[52] If it pays dividends, it does so until it is indifferent between that and reinvesting another dollar, implying that the capital gains, q, that result from reinvesting an extra dollar satisfy $(1 - g\alpha t)q = (1 - t)$. Here, the right–hand side represents the net–of–tax income shareholders receive if an extra dollar is paid as dividends, while the left–hand side measures the net–of–capital–gains–tax income that results from retaining and reinvesting an extra dollar. If q is greater than $(1 - t)/(1 - g\alpha t)$, even when all profits are reinvested, then no dividends would be paid.

Under this theory, what effects should the TRA86 have on the dividend payout rate? Since dividends equal corporate net–of–tax cash flow minus expenditures on new investment, dividends change due to a change in the investment rate, in tax payments, or in pre-tax cash flow. But changes in investment incentives were relatively minor in the TRA86.[53] The TRA86 increased tax payments of firms, at least in the first few years following the tax reform. Any effects of the TRA86 on pre-tax cash flow would be indirect, arising from

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[51] Poterba forecasts an immediate 8.1% increase in dividends after the TRA86, but his forecast holds everything else constant. We calculated a one-period static forecast using actual values for corporate earnings and lagged values of earnings and dividends since these weren't in fact constant.

[52] Use of debt finance is assumed to be constrained by exogenous factors.

[53] For a discussion of the implications of the TRA86 for investment incentives, see Auerbach (1989). Investment in fact increased, implying a larger forecasted fall in dividends under this view.

general equilibrium effects. In in fact pre-tax cash flow and investment were little affected by the TRA86, then this theory forecasts that corporate dividends should fall by the same amount that corporate tax payments went up.[54]

C. Dividends *vs.* purchase of shares in other firms

Rather than repurchasing its own shares, a firm could instead purchase the shares of other firms. Such portfolio investments, funded by foregone dividends, would have slightly different tax consequences than repurchase of the firm's own shares. Both save taxes that would have been paid on the foregone dividends,[55] and both lead to personal capital gains taxes on the sale of shares to the firm. However, the firm will owe some taxes on any dividend income it receives on the shares it purchases,[56] and would owe capital gains taxes if it sells any of these shares. In addition, the firm can be subject to an accumulated earnings tax if it receives earnings from financial assets beyond the reasonable needs of the business.

These various corporate taxes can be avoided, however, if the firm acquires at least 80% of the stock of any given company. Doing so, though, can lead to yet different tax implications than simply repurchasing one's own shares, as summarized in Auerbach and Reishus (1988). To begin with, if either firm had unused tax losses, then these losses can be used to offset the taxable profits of the other firm. This potential gain from a merger should become less important as a result of the TRA86 since tax losses will become less common, and also since the act itself restricted the ability of the merged firm to make use of tax losses built up by one of the separate firms.

In addition, the acquiring firm can step–up the basis of any assets it purchases, though in exchange the shareholders of the selling firm would owe capital gains taxes on the

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[54] Note the parallel between this argument and that resulting from the Myers and Majluf (1984) model of debt policy. Myers and Majluf took dividend payments as exogenous and tied debt finance to corporate cash flow, whereas this model of dividend policy takes debt finance as exogenous and ties dividend payments to corporate cash flow. There has not yet been an explicit marriage of these two theories.

[55] If these share purchases had instead been funded by debt issues, then both would lead to the same increase in interest deductions.

[56] Under the previous law, 15% of dividend receipts were included in taxable income. This fraction was increased to 20% by the TRA86.

increase in basis. Letting ΔB represent the step–up in basis, z represent the present value of depreciation deductions per dollar of initial cost of an asset,[57] and c represent the effective capital gains tax rate on the sale, then the overall tax savings equals $\Delta B(\tau z - c)$, which is positive as long as $\tau z > c$.[58] The TRA86 included several changes which together should have eliminated any tax savings from such a step–up in basis. First, tax lifetimes for depreciation purposes were generally lengthened, the discount rate used in calculating z was increased as a result of the drop in tax rates, and τ was cut, all reducing τz. Prior to the TRA86, capital gains taxes were generally paid just under the individual income tax, based on the General Utilities doctrine, and at a maximum tax rate of 20%. If an installment sale were used, the capital gains tax payments could be postponed, reducing the effective tax rate yet further. Under the TRA86, personal capital gains tax rates on long term gains generally increased, though they were cut on short term gains. In addition, the General Utilities doctrine was repealed, so that capital gains will be taxed at both the corporate and personal levels if a firm liquidated some or all of its assets as part of the takeover. Also, installment sales are usually disallowed under the Act. In combination, these increases in capital gains tax rates should be sufficient to guarantee that $\tau z < c$, implying a tax loss from a step–up in basis.[59]

These tax changes should all make mergers less attractive. How large an effect would be expected? Auerbach and Reishus (1988) found that tax incentives were not capable of explaining the pattern of mergers that occurred prior to 1986, and forecast that little change in merger behavior should be expected.

D. Evidence on dividend payout and merger rates

We now examine how the pattern of payouts from corporations to equity investors has changed since the TRA86. Corporate after-tax profits and dividend payments for 1984–

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[57] We assume implicitly here that assets are depreciated using some form of declining balance formula, but without a switch to straight-line depreciation.

[58] If $\tau z < c$, then the firms can engage in a nontaxable merger, to avoid the resulting tax increase.

[59] See the appendix in Scholes and Wolfson (1988) for a more complete discussion of the effects of the TRA86 on merger incentives.

1989 (first quarter) are given in Table 6. The table also presents our forecasts of the effect of the TRA86 on dividend payments, based on Poterba's (1987) econometric estimates.[60]

The first thing to note is that dividends have dramatically increased as a fraction of after-tax profits.[61] This is consistent with the traditional view that there is some non-tax benefit to paying dividends so that dividends will increase when the tax cost falls. The increase contradicts the "new view" discussed in section 2.B.[62] In fact, the forecasts based on Poterba's estimates are quite reasonable. The payout ratio was forecast to increase 12% in 1987, and another 3% in 1988 (from .59 to .71 and .76, respectively); the actual ratio increased 11% points in 1987 and 3% in 1988.

The theory forecasts, however, that dividends will increase relative to share repurchases. At the bottom of Table 6, we report the net amount spent on share repurchases during the same time period,[63] the total payouts to equity holders (dividends plus share repurchases), and the fraction of total payouts to equity holders that took the form of dividends. Total payouts to equity holders increased dramatically in 1988 and again in the first quarter of 1989. While dividends increased slightly as a fraction of total payouts in 1987, they fell sharply relative to total payouts in 1988 and even more so in 1989 — in spite of the increase in nominal dividend payments, share repurchases increased much more quickly.

How is this sharp increase in share repurchases to be explained? The traditional theory unambiguously forecasts that dividends should have increased relative to repurchases of both a firm's own shares and purchases of shares in other firms. The forecasts based on the Auerbach–Bradford–King model are also sharply inconsistent with the evidence, since their models would forecast a drop in payouts, in contrast to the observed increase; they also assume that repurchases are not possible. Perhaps firms have only recently learned

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[60] We report data for the nonfinancial corporate sector, on a national income basis. Poterba (1987) estimated his dividend regressions on a gross domestic product basis.

[61] Dividends are generally much more stable than after-tax profits, implying that the payout rate rises when after-tax profits fall as they did after 1986. We did not attempt to estimate to what degree the increased payout rate was larger than would be expected given this fall in after-tax profits.

[62] Poterba (1987) also rejects the "new view" for the pre-TRA86 period.

[63] These data, from the Flow of Funds Accounts, do not distinguish between purchases of a firm's own shares and purchases of shares of other firms.

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about the advantages of repurchases (see, *e.g.*, Shoven (1987)), or only recently realized that the I.R.S. will not reclassify these capital gains as dividends. If firms have been so unsophisticated about the tax law, this would undermine much of the research on corporate taxation. Dividend behavior continues to be a puzzle to tax economists.

We did not expect the TRA86 to have major effects on merger activity, since tax effects appeared to be small in the past. However, in a recent paper Scholes and Wolfson (1988) claim to find significant changes in merger activity following the Act. In Table 7 we reproduce some of the data they present on acquisitions of U.S. firms by U.S. firms (we have extended their series from 1987-4 to 1989-1). The numbers are striking, and challenge the forecasts. The constant dollar volume of acquisitions jumped dramatically in the fourth quarter of 1986, after the TRA86 passed but before its relevant provisions took effect. The one-quarter jump is not that surprising: firms that were already planning mergers may simply have rushed to beat the General Utilities deadline and thus save substantial amounts on capital gains taxes. However, there seems to have been a persistent reduction in the level of U.S. acquisitions following 1986. The mean rate of acquisitions is \$34 billion per quarter, *vs.* \$40 billion per quarter during the prior year. It is hard to believe that the lowered rate of activity as late as 1989–1 is still due to the rush to beat General Utilities two years earlier. On the other hand, the rate began increasing again towards the end of this period, and the difference in means is not statistically significant.[64]

3. EFFECTS ON THE CHOICE OF ORGANIZATIONAL FORM

A. Theoretical considerations

Following the assumptions made by Harberger (1962), much of the literature on the incentive effects of the corporate income tax has assumed that production is done by corporations in certain industries and by unincorporated firms in others. In fact, firms can choose among several different organizational forms for tax and legal purposes. Gravelle

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[64] Scholes and Wolfson (1988) also show changes in the types of domestic acquirers. Notably, management unit buyouts and going-private transactions increased, which they argue happened because these transactions are likely to rely more on nontax factors, and thus do not suffer as much from the TRA86. They also show striking effects for acquisitions of U.S. firms by foreign companies, with a large and sustained increase beginning in fourth quarter 1986.

and Kotlikoff (1988, 1989) emphasize that many industries contain a sizeable number of both corporate and noncorporate firms, and that these proportions shift over time. Interest in a firm's choice of organizational form is starting to receive more attention.[65]

What affects a firm's choice of organizational form? Taxes clearly are one consideration. If a firm is an ordinary (C) corporation, its income is taxed first at corporate rates with the remainder taxed again at personal rates when received as dividends or when capital gains are realized. Losses can be carried backwards or forwards across time to offset taxable profits in other years but cannot directly result in tax refunds. In contrast, the income of a partnership, sole proprietorship, or subchapter S corporation is taxed each year at the personal income tax rate of each owner. Losses can be used to offset taxes on other personal income.[66]

Whether a firm would pay less in taxes as a corporation or as a partnership/proprietorship depends on its circumstances. If the corporate income tax rate were below the personal income tax rate of the owners, if the personal taxes paid on corporate after-tax income were low enough (e.g. if little is paid in dividends and shares re not sold), and if the firm has taxable profits, then the firm would pay less in taxes by incorporating.[67] Similarly, if the firm has losses which can be deducted against corporate profits of other affiliated firms and the corporate tax rate is higher than personal tax rates, then the corporate form of ownership incurs lower tax liability. In other cases, the firm would pay less in taxes by remaining unincorporated (or operating as an S corporation).

Another tax consideration potentially enters when some of the income of the firm is taxable as capital gains, *e.g.* sales of property by a real estate firm. The relative tax rate on capital gains has been different under the corporate income tax than under the personal income tax. In general, capital gains have been more favorably treated under the personal income tax, making the corporate form less attractive if the firm receives a nonnegligible fraction of its income in the form of capital gains. However, suppose a

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[65] For other references, see Scholes and Wolfson (1987) and Gravelle (1988).

[66] The TRA86 introduced restrictions on the use of some losses to offset other sources of income; we discuss these restrictions below.

[67] See, for example, Feldstein and Slemrod (1980) for further discussion.

corporation separately incorporated an asset about to be sold and then made a liquidating payment of the sales proceeds to the shareholders. Prior to the TRA86 the General Utilities doctrine allowed the resulting capital gains to be taxed only at the personal level, implying no difference in the effective tax treatment of capital gains from such sales under corporate *vs.* partnership forms of organization.

Taxes are obviously not the only consideration affecting a firm's choice of organizational form. We focus on the choice between ordinary (C) corporations and S corporations. To begin with, there are some eligibility requirements for S corporations: no more than 35 shareholders, not part of an affiliated group, only individual (not corporate) shareholders,[68] only one class of stock, and not a domestic international sales corporation (DISC). In addition, some states tax S corporations under their state corporate tax, rather than under the personal tax, requiring these companies to maintain two sets of tax accounts, one for state and one for Federal taxes. Except for these considerations, however, C and S corporations are treated the same, *e.g.* both have limited liability. There are presumed to be many important non-tax distinctions between corporations and partnerships, however. For example, corporations have limited liability, they can trade ownership shares more easily, they can base compensation of managers on the price of a publicly-traded ownership share, and so on.[69] There has been little careful economic analysis, however, of the nontax factors that are likely to be important.

The TRA86 had conflicting effects on a firm's choice between C and S status. We discuss first the new advantages of an S election. To begin with, in most cases the personal tax rate was cut by more than the corporate tax rate, increasing the attraction of receiving income as an S rather than as a C corporation.[70] Perhaps more importantly, the General Utilities doctrine was repealed for corporations. Thus, the capital gains on a sale of assets

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[68] Some estates and trusts can be shareholders.

[69] If a firm is organized as a limited partnership, all investors except the general partner can have limited liability. Further, the general partner can be a corporation, giving it limited liability. Also, ownership shares in some partnerships have been publicly traded; however, the 1987 tax law requires that most new publicly-traded partnerships be taxed as corporations.

[70] The first $50,000 of corporate income is still taxed at less than the 28% and 33% marginal personal rates. However, that income will be subject to double taxation so the desirability of C status still depends on the degree of tax deferral through retaining earnings in the corporation.

in corporate form will now be taxed first at the full corporate rate, and then again at the full personal rate. Since no corporate tax applies to an S corporation, capital gains are taxed only at the personal rate of the shareholders. Any firm that earns substantial income from capital gains, or that is liquidated or purchased in a taxable takeover, will reap large tax savings from choosing S status.[71]

In addition, S corporations are not subject to the new alternative minimum tax (AMT) faced by C corporations. This factor will be especially important for firms with substantial tax deferrals and accounting practices that lead to large book income relative to taxable income, because the AMT includes 50% of that difference in the alternative tax base. Second, income from a C corporation cannot be used to offset "passive" losses, whereas income (to nonmanagers) from an S corporation can be.[72]

These gains were emphasized by Scholes and Wolfson (1988) and Plesko (1988), who predicted as a result that S corporations would become a much more important form after the TRA86. The TRA86 also introduced some offsetting costs to the choice of S corporation status, however. For instance, most fringe benefits that are deductible from C corporation income will be deductible for S corporations only to the extent that these deductions are allowed under the personal income tax. The higher floors set on many personal deductions mean that some expenses will generate lower tax savings in S corporation form. In particular, health and accident benefit insurance can be fully deducted by a C corporation, but only medical expenses in excess of 7.5% of adjusted gross income are deductible from the personal tax base. In addition, the new passive loss restrictions can work against some S corporations: if the firm earns losses then passive shareholders cannot use those losses to offset ordinary personal income. Although the same

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[71] Changing to a partnership may not be as favorable because disincorporation is a taxable event subject to the capital gains tax. However, the partnership form may be more desirable after the repeal of General Utilities for new firms just starting up.

[72] In some cases, an identical result can be achieved by having the C corporation purchase the activity generating the passive loss. These losses then offset the income of the C corporation, and the same amount of corporate tax is avoided. However, transactions costs may be lower if individuals own some partnership and some S corporation shares, tailoring their portfolio to individual needs, rather than arranging ownership of C corporations so that the shareholders collectively benefit from the merger of corporate gains and passive losses.

loss carryback and carryforward provisions are available for C and passive S corporations, this is an unfavorable change for passive S shareholders from the pre-TRA86 rules.

One significant provision may make a switch from C to S status less appealing than the choice of S status for a new firm. With the repeal of the General Utilities doctrine, Congress expected that many C corporations would retain their status but then strategically switch to S status just before a major asset sale or liquidation in order to avoid the corporate capital gains tax. Section 1374 was enacted to remove this incentive. Under Section 1374, firms that convert to S status must pay tax at the top corporate rate on any "built-in gains" realized during the 10 years following conversion. Built-in gains are defined to include any difference between the fair market value of the firm at conversion and the C corporation tax basis at that time. Thus, a firm that switches to S status and liquidates the next day will pay the full corporate tax on the entire capital gain. In principle, this provision should not make the incentives for choosing S status different for existing and new firms, since in both cases the favorable capital gains treatment for an S corporation applies equally to all gains incurred after the date of S election. However, the added transactions costs of bookkeeping and negotiating with the I.R.S. about the amount of the built-in gains from a conversion may be sufficient to reduce the desirability of converting from C to S status.

B. Empirical evidence

How large an effect would these changes in tax incentives likely have on firms' choices of organizational form? Unfortunately, the quantitative importance of tax incentives relative to the various nontax considerations has not yet been explored.[73] However, on the assumption that the TRA86 provided the only change in the incentives for choosing a particular form since 1985, we can attempt to forecast the direction of the effects, and compare the forecasts to the data.

We showed above that the TRA86 changed both the benefits and costs of electing noncorporate tax status. Although there are no careful measurements of the relative value of the different provisions to firms, it seems plausible to think that for a typical firm the

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[73] See Plesko (1988) for an exception. We are currently attempting such empirical work.

choice of S status looks more favorable than it did before 1986. The main benefits are the lower tax rates available at the personal level, and the single-taxation of new capital gains; the main costs appear to be the reduced deductibility of some noncash forms of compensation and increased transaction costs arising from the taxation of built–in gains when a company shifts from C to S status. If this judgement is correct, then there should be a shift of economic activity towards the noncorporate sector. Of course, any given firm would be more likely to shift to S status if it can satisfy the eligibility requirements described above without substantial changes.

In Figure 1 we present data from the NIPA accounts on profits plus interest in various corporate and noncorporate sectors of the economy since 1980. Except for the bad year for corporations in 1982, the level of capital income is almost the same in the corporate and noncorporate sectors. These magnitudes suggest that more attention to noncorporate business taxation and organizational choice incentives may well be warranted. However, the TRA86 had no apparent impact on the relative levels of activity. Capital income has been relatively stable since 1986, with no trend in either series.[14]

Unfortunately the tax incentives which are our primary interest make it unlikely that measures of net income can be very informative. Given differences in corporate and personal tax rates, and the varying treatment of capital gains, the choice of organizational form will depend in part on whether the firm is earning profits or losses. (For example, the aggregate taxable income of partnerships has been negative since 1981.) The same firm may be organized in different forms at different times precisely because of its time path of gains and losses. For example, S corporations were often recommended as an initial status for new firms that expected losses (while depreciation on initial investment was high and revenues low) because the losses could immediately offset personal income, but a change to C status would follow as the need for broader ownership increased. Thus, annual net income may be a poor measure of the amount of economic activity undertaken in various organizational forms.

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[14] NIPA measures of capital income since 1986 are still preliminary because they do not yet reflect actual corporate tax collections. The July 1990 revisions will be the first to incorproate actual 1986 corporate tax data. Thus, we cannot be confident about the apparent lack of change in the series after 1986.

Information about the assets of firms choosing each form of organization would be much more informative. For example, in 1985 partnerships had 1/10 as much in assets as corporations, but corporations had taxable income of $266 billion while partnerships reported income of $-$17 billion. Unfortunately this information is not yet available for the period after the TRA86.

Another piece of evidence about post-TRA86 activity is available. Firms electing to be taxed as an S corporation must file Form 2553 with the I.R.S. We present semi-annual data on these filings for recent years in Figure 2. Two points are striking. First, there was a massive surge in S elections immediately following the TRA86: about 375,000 filings during the first six months of 1987, compared to an average six-month rate of about 150,000 during 1983–1986. Second, no trend was apparent before 1987, but the filing rate has been higher during every period after the reform than during any prior period. Thus, we see evidence both that a large number of existing firms elected to convert from C to S status (the initial surge) and that many more firms are continuing to choose S status (presumably both further conversions and a higher rate of new S incorporation).

Unfortunately, just looking at the number of firms does not indicate the amount of economic activity. For example, many of the new S corporations may be very small, with most assets remaining under C status despite the increased number of S corporations.

One bit of evidence from tax returns is available at this time. The net income from partnerships and S corporations reported on individual tax returns is presented in Table 8. From 1981 to 1986 this reported income averaged $-$2.2 billion. In a remarkable turnaround, $32 billion in positive (net) income was reported in 1987. Although we cannot tell the extent to which assets and activities moved among different forms, it appears that the nature of activity changed dramatically. Much of the difference could be due to passive losses borne by individuals who did not have offsetting passive gains. However, the total profits for the subset of partnerships with positive income were only $32 billion in 1985. Thus, to explain the 1987 reported profits in Table 8, either almost all passive losses were not deductible, or more likely a substantial amount of loss activity was shifted into corporate form, where it could be deducted at a higher tax rate, while gains were left to be taxed at the lower personal rates.

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4. CONCLUSIONS

How successful were the traditional models of corporate financial policy in forecasting the response of corporations to the Tax Reform Act of 1986? Results are mixed at best.

To begin with, traditional models implied that the tax incentive to use debt *vs.* equity increased substantially as a result of the tax reform. Given the available empirical evidence on the responsiveness of debt/value ratios to tax incentives, this led us to forecast that debt/value ratios would increase by .155, in contrast to an observed increase of only .041. While the actual change was in the forecasted direction, its magnitude was far smaller than forecast.

We discussed some possible explanations for the lower-than-expected changes in debt/value ratios, but available data and models are inadequate to test their plausibility. Of particular interest is the possibility that the effective tax on retained earnings has been underestimated in the past because of naive assumptions about optimal trading strategies. Recent developments in trading theory suggest that a lower capital gains tax rate encourages higher share turnover and thus a higher tax on retentions, giving firms an incentive to rely more heavily on debt. If so, then TRA86 may have reduced the penalty on retained earnings by equalizing the taxation of capital gains and ordinary income.

In addition, some aspects of the Tax Reform Act raised interesting new issues for future research. One possibly important effect is the change in the relative desirability of overseas borrowing for multinational corporations. The "one-taxpayer" interest allocation rules will allow many firms to reduce their foreign tax liability (without affecting U.S. tax liability) by borrowing through their foreign branch operations rather than domestically.

We also examined the implications of the tax reform for the form of corporate payouts. Dividend payments were discouraged by the tax law far more before the reform than after, leading most traditional theories to forecast an increase in the fraction of payouts taking the form of dividends. While dividends did in fact increase, and by an amount quite consistent with the forecasts in Poterba (1987), repurchases of shares increased at a much faster rate implying a sharp drop in the fraction of payouts taking the form of dividends. We had no convincing explanation. The Auerbach–Bradford–King model of dividend policy would have forecast a fall in dividend payments, which was also inconsistent with the evidence.

What about a firm's choice of organizational form? Our assessment was that the existing theory was not capable of forecasting how the changes in the tax law would affect the attractiveness of the corporate relative to various noncorporate forms of organization. The data show that a large number of firms elected S corporation status, but we do not yet know how much economic activity these firms represent. The first piece of available tax evidence suggests that loss operations have shifted towards the more highly-taxed corporate sector, while gain operations are being taxed at the lower personal rates. Further analysis awaits the release of post-TRA86 tax data by the I.R.S.

One of the main problems in developing and testing models of the effects of taxes on corporate financial policy prior to the Tax Reform Act had been the lack of variation in tax policy since World War II. Given the sharp changes in incentives created by this Act, economists will now be in a much better position to refine their understanding of the determinants of corporate financial policies. Our results show that they need to.

REFERENCES

Altman, E. I. (1968) "Financial Ratios, Discriminant Analysis, and the Prediction of Corporate Bankruptcy," *Journal of Finance*, **23**, 589–609.

Altshuler, R. and A. J. Auerbach (1990) "The Significance of Tax Law Asymmetries: An Empirical Investigation," Forthcoming, *Quarterly Journal of Economics*.

Ang, J. S. and D. R. Peterson (1986) "Optimal Debt Versus Debt Capacity: A Disequilibrium Model of Corporate Debt Behavior," in *Research in Finance, vol. 6*, ed. Chen, A. W.. Greenwich, CT: JAI Press.

Auerbach, A. J. (1979) "Wealth Maximization and the Cost of Capital," *Quarterly Journal of Economics*, **93**, 433–46.

Auerbach, A. J. (1985) "Real Determinants of Corporate Leverage," in *Corporate Capital Structures in the United States*, ed. Friedman, B. M.. Chicago: University of Chicago Press.

Auerbach, A. J. and D. Reishus (1988) "The Effects of Taxation on the Merger Decision," in *Corporate Takeovers*, ed. Auerbach, A.. Chicago: Chicago University Press.

Barclay, M. and C. W. Smith, Jr. (1987) "Corporate Payout Policy: Cash Dividends versus Share Repurchases," Working Paper, William E. Simon Graduate School of Business.

Bernheim, B. D. (1988) "Dividends versus Share Repurchases as Signals of Profitability," Working Paper, Stanford University.

Bhattacharya, S. (1979) "Imperfect Information, Dividend Policy, and the "Bird in the Hand" Fallacy," *Bell Journal of Economics*, **10**, 225–235.

Bradford, D. F. (1981) "The Incidence and Allocation Effects of a Tax on Corporate Distributions," *Journal of Public Economics*, **15**, 1–22.

Bradley, M., G. A. Jarrell, and E. H. Kim (1984) "On the Existence of an Optimal Capital Structure: Theory and Evidence," *Journal of Finance*, **39**, 857–878.

Bulow, J. and J. Shoven (1978) "The Bankruptcy Decision," *Bell Journal of Economics*, 9, 437–56.

Constantinides, G. M. (1984) "Optimal Stock Trading with Personal Taxes," *Journal of Financial Economics*, 13, 65–89.

DeAngelo, H. and R. W. Masulis (1980) "Optimal Capital Structure Under Corporate and Personal Taxation," *Journal of Financial Economics*, 8, 3–29.

Feldstein, M. S. (1989) "Excess Debt and Unbalanced Investment: The Case for a Cashflow Business Tax," Testimony before the Committee on Ways and Means, U.S. Congress, January 31.

Feldstein, M. S. and J. Slemrod (1980) "Personal Taxation, Portfolio Choice, and the Effect of the Corporation Income Tax," *Journal of Political Economy*, 88, 854–866.

Feldstein, M. S., L. Dicks-Mireaux, and J. Poterba (1983) "The Effective Tax Rate and the Pretax Rate of Return," *Journal of Public Economics*, 21, 129–58.

Givoly, D., C. Hayn, A. R. Ofer, and O. Sarig (1989) "Taxes and Capital Structure: Evidence from Firms' Response to the Tax Reform Acto of 1986," Northwestern University Graduate School of Business Working Paper.

Gordon, R. H. (1982) "Interest Rates, Inflation, and Corporate Financial Policy," *Brooking Papers on Economic Activity*, 2, 461–88.

Gordon, R. H. (1989) "Do Publicly Traded Corporations Act in the Public Interest?," Working Paper, University of Michigan.

Gordon, R. H. and D. F. Bradford (1980) "Taxation and the Stock Market Valuation of Capital Gains and Dividends," *Journal of Public Economics*, 14, 109–136.

Gordon, R. H. and B. G. Malkiel (1981) "Corporation Finance," in *How Taxes Affect Economic Behavior*, ed. H. J. Aaron and J. A. Pechman. Washington, D.C.: Brookings Institution.

Gravelle, J. G. (1988) "Corporate Taxation and the Efficiency Gains of the 1986 Tax Reform Act—A New Look," Working Paper, Congressional Research Service.

Gravelle, J. G. and L. J. Kotlikoff (1988) "Does the Harberger Model Greatly Understate the Excess Burden of the Corporate Income Tax?," NBER Working Paper No. 2742.

Gravelle, J. G. and L. J. Kotlikoff (1989) "The Incidence and Efficiency Costs of Corporate Taxation When Corporate and Noncorporate Firms Produce the Same Goods," *Journal of Political Economy*, **97**, 749–81.

Harberger, A. C. (1962) "The Incidence of the Corporation Income Tax," *Journal of Political Economy*, **70**, 215–240.

Jensen, M. C. and W. H. Meckling (1976) "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure," *Journal of Financial Economics*, 3, 305–60.

King, M. A. (1977) *Public Policy and the Corporation*. London: Chapman and Hall.

King, M. A. and J. I. Leape (1984) "Wealth and Portfolio Composition: Theory and Evidence," NBER Working Paper No. 1468.

Long, M. S. and I. B. Malitz (1985) "Investment Patterns and Financial Leverage," in *Corporate Capital Structures in the United States*, ed. Friedman, B. M.. Chicago: University of Chicago Press.

MacKie-Mason, J. K. (1990) "Do Taxes Affect Corporate Financing Decisions?," Forthcoming in *Journal of Finance*.

MacKie-Mason, J. K. (1989) "Do Firms Care Who Provides Their Financing?," in *Investment, Information and Credit Markets*, ed. R. G. Hubbard, forthcoming. Chicago: Chicago University Press.

Manchester, J. and J. Poterba (1989) "Second Mortgages and Household Saving," *Regional Science and Urban Economics*, **19**, 325–346.

Miller, M. and K. Rock (1985) "Dividend Policy Under Asymmetric Information," *Journal of Finance*, **40**, 1031–1051.

Miller, M. H. (1977) "Debt and Taxes," *Journal of Finance*, **32**, 261–275.

Miller, M. H. and F. Modigliani (1961) "Dividend Policy, Growth and the Valuation of Shares," *Journal of Business*, **34**, 411–33.

Modigliani, F. and M. H. Miller (1958) "The Cost of Capital, Corporation Finance, and the Theory of Investment," *American Economic Review*, **48**, 261–97.

Myers, S. C. (1977) "Determinants of Corporate Borrowing," *Journal of Financial Economics*, **5**, 147–175.

Myers, S. C. and N. S. Majluf (1984) "Corporate Financing and Investment Decisions When Firms have Information that Investors Do Not Have," *Journal of Financial Economics*, **13**, 187–221.

Plesko, G. A. (1988) "Choice of Corporate Entity: The Use of S Corporations Before and After the Tax Reform Act of 1986," Working Paper, Office of Tax Analysis, U.S. Department of Treasury.

Poterba, J. (1987) "Tax Policy and Corporate Savings," *Brooking Papers on Economic Activity*, **2**, 455–503.

Poterba, J. and L. Summers (1985) "The Economic Effects of Dividend Taxation," in *Recent Advances in Corporate Finance*, ed. E. I. Altman and M. G. Subrahmanyam. Homewood, IL: R. D. Irwin.

Poterba, J. M. (1989) "Tax Reform and the Market for Tax-Exempt Debt," NBER Working Paper No. 2900.

Scholes, M. S. and M. A. Wolfson (1987) "Taxes and Organization Theory," Working Paper, Stanford Graduate School of Business.

Scholes, M. S. and M. A. Wolfson (1988) "The Effects of Changes in Tax Laws on Corporate Reorganization Activity," Working Paper, Stanford Graduate School of Business.

Shoven, John B. (1987) "The Tax Consequences of Share Repurchases and Other Non-Dividend Cash Payments to Equity Owners," in *Tax Policy and the Economy*, ed. L. H. Summers. Cambridge: MIT Press.

Stiglitz, J. E. (1983) "Some Aspects of the Taxation of Capital Gains," *Journal of Public Economics*, **21**, 257–294.

Stiglitz, J. E. and A. Weiss (1981) "Credit Rationing in Markets with Imperfect Information," *American Economic Review*, **71**, 393–410.

Warner, J. B. (1977) "Bankruptcy Costs: Some Evidence," *Journal of Finance*, **32**, 337–347.

White, M. J. (1980) "Public Policy Toward Bankruptcy: Me-First and Other Priority Rules," *Bell Journal of Economics*, **11**, 550–64.

White, M. J. (1989) "The Corporate Bankruptcy Decision," *Journal of Economic Perspectives*, **3**, 129–151.

Table 1

Tax Advantage to Debt Finance

Tax rate on equity: $T + (1 - T)e$

Tax rate on debt: t

T	effective marginal corporate tax rate on interest deductions
e	effective marginal personal tax rate on equity income
	$= dt + (1 - d)g\alpha t$
t	tax rate of marginal investor in debt
d	dividend payout ratio
g	fraction of long-term capital gains that are taxable
α	present-value factor for capital gains deferral

Parameter	1986	1987	1988
T	0.318	0.340	0.289
e	0.122	0.149	0.127
t	0.202	0.190	0.155
d	0.560	0.711	0.758
g	0.400	1.000	1.000
α	0.250	0.250	0.250
Equity Tax	0.401	0.438	0.379
Debt Tax	0.202	0.190	0.155
Difference	0.199	0.248	0.224

Source Notes:

T from Altshuler and Auerbach (1987) for 1986; 0.85∗ statutory rate for 1987–1988.

t from Poterba (1989).

d from NIPA for 1986 (average 1984–86). Forecasts based on Poterba (1989) for 1987–88.

α from Feldstein, Dicks-Mireaux and Poterba (1983).

Other parameters calculated as described in text.

Table 2

Predicted Fraction of Debt Issues in Public Offerings

	1986	1987	1988
With TRA86	0.46	0.54	0.43
Without TRA86	0.41	0.52	0.37
Difference	0.05	0.02	0.06

Source: Based on model estimates in MacKie-Mason (1990). Predictions "with TRA86" use observed values for all explanatory variables. Predictions "without TRA86" replace actual ITC/ZPROB (investment tax credits interacted with a tax exhaustion predictor; see text) with estimate of its value without the tax reform. See text and MacKie-Mason (1990) for details.

Note: The estimates in MacKie-Mason (1990) were based on a sample of individual firms with a much higher debt fraction in 1986 (72%) than the population mean (46%). The discrete choice estimation method used sets the intercept to correctly predict the mean fraction of debt issues. To correct for the different mean in the full population we subtracted an intercept dummy equal to −0.2 from the regression function.

Table 3

Flow of Borrowing and Interest Deductions by Individuals

| Year | Flow of Total Borrowing | | Interest Reported on Schedule A | |
| | Nonfarm Mortgages | Consumer Credit | Mortgages | Consumer Credit |
	(Billions of nominal dollars)		(Millions of nominal dollars)	
1980	96.4	2.6		
1981	73.8	16.9		
1982	52.9	16.4		
1983	120.4	49.0		
1984	136.7	81.6		
1985	157.0	82.5		
1986	216.7	58.0	122.2	71.7
1987	233.9	32.9	134.5	65.3
1988	219.6	51.1	138.5	62.3
1989–1	187.0	34.9		

Sources: Borrowing flows: Board of Governors of the Federal Reserve System, *Flow of Funds Accounts, First Quarter 1989*, June 2, 1989. Interest reported: Tabluation provided by Brian Erard, IRS, from IRS tax reform panel study sample.

Notes: 1989 data are at an annual rate for first quarter only. Nonmortgage interest reported is the interest deducted on Schedule A grossed up by the allowable fraction of total interest (100%, 65% and 40% in 1986–88, respectively).

Table 4

Average Debt/Value Changes Since 1985

(996 Compustat firms; book debt and market equity)

	1985	1986	1987	1988
Debt/Value	0.398	0.403	0.441	0.439
Changes since 1985				
All firms		0.005	0.043	0.041
1985 ITC: low		0.000	0.036	0.030
1985 ITC: high		0.010	0.050	0.052
1985 ZPINV: low		0.011	0.068	0.069
1985 ZPINV: high		-0.001	0.018	0.014
Foreign ops: yes		0.014	0.038	0.040
Foreign ops: no		0.006	0.052	0.060

Source: 1988 Compustat Primary, Secondary and Tertiary tape. Sample size is 996 firms, except for "Foreign Ops" for which only 778 firms had nonmissing data.

Notes:

1. The debt/value ratio is calculated as (book debt) / (book debt + market value of equity), with the market value of equity measured on 12/31, and with book debt equal to the sum of short-term and long-term debt.

2. Firms split approximately at median value of ITC/(after-tax income), which was 0.0445; 491 firms in "low".

3. ZPINV is 1/ZPROB, where ZPROB is Altman's (1966) predictor of firm bankruptcy. Firms split approximately at median value of ZPINV, which was 0.504; 495 firms in "low".

4. We determine whether a firm has foreign operations based on whether it reports any foreign income tax payments on its Form 10K. 404 firms are classified as having foreign operations.

Table 5

Stock and Bond Issues

	Number of Issues			Amount in $ billions		
	Stocks	Bonds	Debt Fraction	Stocks	Bonds	Debt Fraction
1980	826	515	0.38	12.7	40.0	0.76
1981	1135	423	0.27	14.2	34.7	0.71
1982	746	595	0.44	13.4	42.3	0.76
1983	1765	589	0.25	29.8	43.6	0.59
1984	1038	587	0.36	8.8	56.1	0.86
1985	1175	1020	0.47	18.4	81.7	0.82
1986	1846	1551	0.46	34.2	168.6	0.83
1987	1676	1851	0.53	37.6	181.7	0.73
1988	983	1885	0.66	22.2	170.4	0.89

Source: U.S. Securities and Exchange Commission, *SEC Monthly Statistical Review*, vol. 48, Tables M-371 and M-375, various issues.

Notes:

1. "Stocks" are primary, public offerings of conventional common stock.

2. "Bonds" are primary, public offerings of non-convertible bonds.

3. December 1988 data used in calculating 1988 totals are preliminary.

Table 6

Corporate Payouts to Equity

(Billions of dollars)

	1984	1985	1986	1987	1988	1989-1	1984-86 Avg
Profit after tax	147.9	154.2	152.8	137.2	142.4	123.4	151.6
Dividends	81.0	84.0	89.9	95.5	103.3	109.6	85.0
Forecast divs				97.5	108.0		
Payout ratio	0.548	0.545	0.588	0.696	0.725	0.888	0.560
Forecast ratio				0.711	0.758		
Net repurchases	74.5	81.5	80.8	76.5	130.5	180.0	78.9
Total payouts	155.5	165.5	170.7	172.0	233.8	289.6	163.9
Divs/payouts	0.521	0.508	0.527	0.555	0.442	0.378	0.518

Source: Board of Governors of the Federal Reserve, *Flow of Funds Accounts, First Quarter 1989*, June 2, 1989.

Notes:

1. 1989 data are at an annual rate for first quarter only.

2. Payout ratio is defined as (Net divs) / (After-tax profit + CCA + IVA). This is the dividend payout of book income, not payout of cash flow (which includes depreciation).

3. Dividend forecast is based on Poterba (1987), Table 5. The forecast used actual values for all explanatory variables, converted to 1982 dollars. The results were then reinflated to nominal dollars.

4. Repurchases are net of new equity issues.

Table 7

Domestic Merger and Acquisition Activity

(Billions of 1987-4 constant dollars)

Quarter	US acquis. of US firms
1985-4	48.60
1986-1	31.65
1986-2	46.22
1986-3	35.33
Avg.	40.45
1986-4	67.44
1987-1	22.02
1987-2	31.65
1987-3	32.98
1987-4	33.96
1988-1	27.71
1988-2	42.18
1988-3	28.86
1988-4	57.74
1989-1	28.62
Avg.	33.97

Sources: Nominal merger values from *Mergers and Acquisitions*, various issues. CPI-Urban from U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, various issues. This table reproduces and extends part of Table 1 in Scholes and Wolfson (1988).

Table 8

Income from Partnerships and S Corporations Reported on
Individual Income Tax Returns

(Billions of nominal dollars)

Year	Net Reported Income
1980	10.1
1981	-0.9
1982	-1.7
1983	-0.5
1984	-2.2
1985	-2.2
1986	-5.9
1987	32.1

Source: U.S. Internal Revenue Service, *Statistics of Income Bulletin*, various issues.

Figure 1
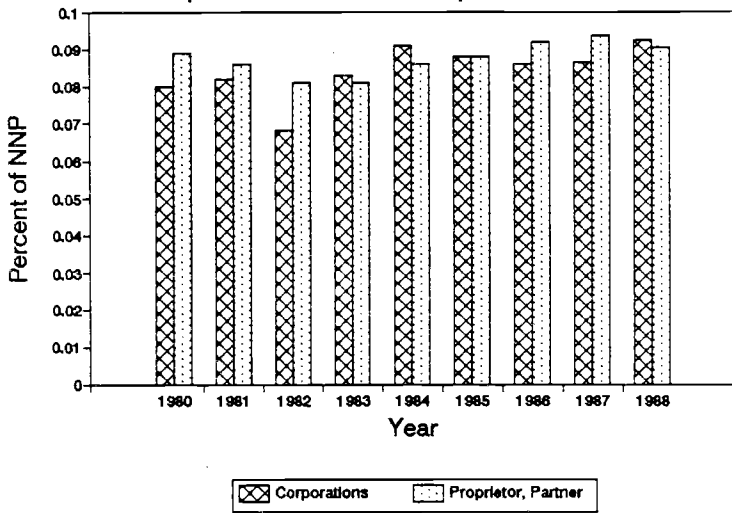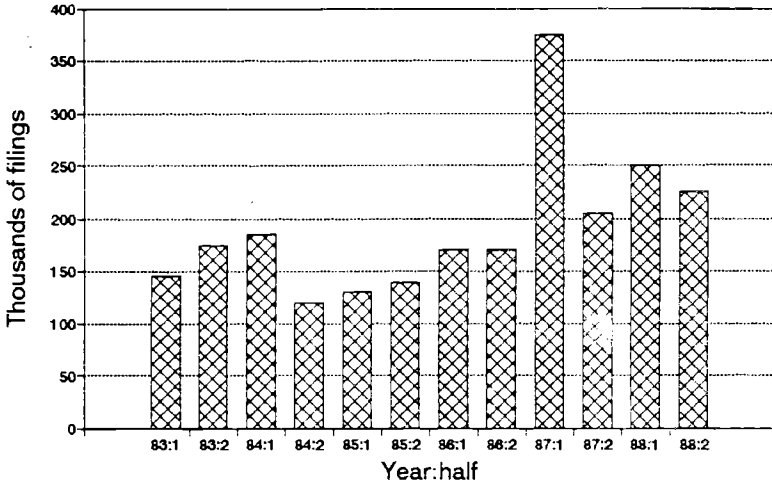Profits and Interest from
Corporate and Non-Corporate Sectors

Figure 2
S Corporation Elections (Form 2553)
1983-1988

Source: Plesko (1988)