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## Anticipated Tax Changes and the Timing of Investment

Alan J. Auerbach and James R. Hines, Jr.

Important changes in the federal tax provisions affecting investment in business plant and equipment were enacted in 1982, 1984, and 1985. There is every reason to believe that 1986 will not be an exception to this pattern. Yet the methods economists use to measure the impacts of changes in the tax law generally assume that such changes will be permanent; they ignore problems of transition. Such analysis can be valuable for understanding the underlying differences among alternative tax systems but may be uninformative about the short-run impact of tax reform on investment. Moreover, the effects of tax changes on the value of corporate securities is typically ignored, although the effects may be quite large.

Consideration of short-run effects on investment and market value requires a careful analysis of three elements of behavior that are normally omitted from long-run analysis of tax reforms: the state of investor expectations, the time lags involved in putting new capital in place, and the tax law's distinctions between new and old capital. Continual tax changes that may appear beneficial when examined in isolation have the potential to be destabilizing when used in combination and when anticipated by investors. To the extent that businesses require time to adjust to changing economic conditions, attempts at frequent fine-tuning of the tax system may do little more than cause the stock market to fluctuate. Additional changes in market value may be associated with tax reforms that narrow or widen the gap between the tax benefits available to new and previously purchased assets.

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This paper (see Martin Feldstein, ed., *The Effects of Taxation on Capital Accumulation* [Chicago: University of Chicago, 1987]) presents a framework for tax analysis that addresses these issues, focusing on the effects of tax policy on investment and market values over the past three decades and the potential impact of a number of the tax reform plans that have been promulgated in recent months. The model separately considers investment in equipment and investment in plant. The tax law treats these two classes of assets quite differently, and they exhibit different historical investment patterns. The model also allows one to make different assumptions about the degree of investor anticipations of changes in tax policies and other economic conditions. By using parameters based on historical investment patterns, the model allows one to assess realistically the impact of particular policy changes.

Our results for the period 1954–85 suggest that investors did take account of fluctuations in profitability, real interest rates, and the tax code in making their investment plans. Simulations that assume that investors anticipated future changes in these variables produce more realistic annual investment patterns than those that assume all such changes were unanticipated.

This historical period that we study was characterized by generally falling rates of tax on new corporate investment, particularly in equipment. Equipment received major benefits from the introduction of accelerated depreciation in 1954, the investment tax credit in 1962, the Asset Depreciation Range (ADR) System in 1971, and the Accelerated Cost Recovery System (ACRS) in 1981. Over the period, the fixed corporate capital stock grew at a compounded annual rate of 3.9%, with equipment growing at a rate of 5.0% per year, and structures at a rate of 3.1%. It is interesting to ask how much of this growth was due to the tax incentives instituted over the same period.

Our simulations suggest that the investment tax credit alone accounted for a rise of 0.5% per year in the annual growth rate of the equipment capital stock and 0.3% per year for the total fixed capital stock. However, there is also evidence that the timing of the investment tax credit destabilized investment. Equipment investment was extremely strong during the mid-1960s, partly because of the enactment of the credit. Yet our results suggest that investment would have been strong during this period even without the credit, because corporate investors enjoyed very high before-tax profitability of capital during the period. On the other hand, the presence of ACRS during recent years has helped to lessen the observed decline in investment, which we attribute to reduced profitability and extremely high real interest rates. One interesting aspect of the simulations is their inability to explain the strong recovery of 1984 in equipment investment that occurred in the face of continuing low profitability and high real interest rates.

Until the boom of recent years, the poor performance of the stock market had proved a puzzle for economists. At least one reason for the declining real value of the stock market may have been the increasing distinction between the treatment of new and old capital that accompanied incentives for new investment. As a fraction of the corporate fixed capital stock's replacement value, the market value of the corporations themselves should have been about one-third lower in 1985 than in 1954, according to our simulations. This suggests that policies that have been good for investment have not necessarily been good for investors. Investment incentives make new capital more profitable but may reduce the relative value of old capital that lacks comparable tax incentives.

In this light, it is interesting to consider the effects of a variety of proposed tax reforms, including the Bradley-Gephardt "Fair Tax," the Treasury II plan, and the Rostenkowski plan, HR 3838, passed by the House of Representatives in January 1986. Each plan shares three salient characteristics affecting fixed corporate investment: reductions in the corporate tax rate, repeal of the investment tax credit, and a move toward capital recovery allowances based on true economic depreciation. Our simulation results suggest that all three plans would reduce fixed investment in the short run, with the reduction coming primarily in equipment. If the real, after-tax interest rate remains constant, then structures investment is predicted to rise under all three plans in the short run. The investment mix would be similar under the different plans, with the overall level of investment being highest under Treasury II and lowest under the Rostenkowski plan.

Our simulations also predict large windfalls for existing capital assets under all three plans, with Bradley-Gephardt increasing the market value of corporate fixed capital by the most at 26%, and HR 3838 by the least, 16%, again assuming a fixed after-tax interest rate. Thus, all three plans would reverse the trend of the last three decades, when existing assets became less valuable relative to new ones with each new investment incentive. The predicted windfalls result from the reduced corporate tax rate, which applies to new and old income sources alike, and the reduced value of depreciation allowances and investment tax credits available for new investment. They represent a very substantial revenue cost to the Treasury of a magnitude several times larger than would have been recouped by the windfall tax on excess depreciation proposed as part of Treasury II.

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## Tax-Loss Carryforwards and Corporate Tax Incentives

Alan J. Auerbach and James M. Poterba

The recent decline in corporate tax revenues has generated new interest in the corporate income tax. During the last few years, low profitability and highly accelerated depreciation allowances for new investment have combined to generate tax losses for many firms. Some of these firms have been able to carry their losses back against taxes paid in previous years, and they have received refunds. For other firms, however, recent tax losses have exceeded the maximum potential carryback. These firms must carry their unused tax losses forward and use them to offset taxable profits earned in the next fifteen years.

For firms with tax-loss carryforwards, the effective configuration of investment incentives may be substantially different than for fully taxable firms. A firm that is currently taxable and expects to be taxable in the next few years will be able to use its depreciation deductions as soon as they accrue. For a firm with loss carryforwards that does not expect to become taxable in the near future, however, currently accruing depreciation deductions may not be realized for many years. This reduces the effect of investment incentives, such as the investment tax credit or accelerated depreciation allowances. Firms with loss carryforwards also receive a tax benefit, however. Their earnings on new projects may be virtually untaxed for several years, reducing the burden of the corporate tax and therefore encouraging investment.

This paper (see Martin Feldstein, ed., *The Effects of Taxation on Capital Accumulation* [Chicago: University of Chicago Press, 1987]) estimates the importance of loss carryforwards for U.S. firms and then

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calculates the impact of these carryforwards on corporate investment incentives. We focus on the period 1981–84 and gather data from corporate annual reports and 10-K filings to determine which firms have tax loss carryforwards or are otherwise restricted in their use of investment incentives. We find a substantial increase in the total stock of outstanding loss carryforwards during the sample period, and find that at least 15% of corporations were carrying losses forward at the end of 1984. In some industries, the incidence of loss carryforwards is substantially higher.

To analyze the persistence of loss carryforwards, we estimate the probability that firms with carryforwards will exhaust them and become taxable between one tax year and the next. The data suggest that, between 1982 and 1984, ninety-one out of 100 firms with loss carryforwards in one year continued carrying losses forward in the next year. Only nine out of 100 become fully taxable in a typical year; this suggests that, once a firm experiences a tax-loss carryforward, it may not return to currently taxable status for several years. For taxable firms, the odds of entering the loss-carryforward position are small: only two firms in 100 move from being currently taxable to having a loss carryforward in a typical one-year period. The strong persistence of loss carryforwards makes the deferral of depreciation allowances a potentially significant effect on the firm's investment incentives.

We summarize the effect of loss carryforwards on investment incentives using effective tax rates, which measure the total tax wedge between the pretax and posttax return on investing in different assets. We find that, under pre-1986 law, the effective tax rate for an investment in industrial equipment for a firm that is currently taxable is  $-5.8\%$ . The negative effective tax rate indicates that the combination of accelerated depreciation and the investment tax credit actually subsidizes equipment investment for taxable firms. For loss-carryforward firms, however, the effective tax rate on equipment is  $15.0\%$ . Because these firms are unable to use accelerated depreciation allowances as they accrue, and because they are more likely to be taxable in the distant future when the investment is yielding taxable profits than in the near term when it is generating negative taxable income, the net effect of the tax system discourages these firms from undertaking equipment investments. A rather different picture emerges for the case of industrial buildings, where the taxable and tax-loss firms face similar effective tax rates. For the currently taxable firm, the effective tax rate on buildings is  $41.7\%$ , while for the firm with a loss carryforward, it is  $38.3\%$ . The tax system provides a net disincentive to structures investment for both classes of firms.

The dramatic disparity in effective tax rates on equipment and the small differences for structures are due to the different time paths of

depreciation allowances for the two assets. For equipment, a firm's tax status in the near term is of central importance in determining the present value of its depreciation deductions. For structures, however, the depreciation allowances accrue over a much longer horizon. The fraction of currently taxable firms that will have tax-loss carryforwards ten years from today is much higher than the fraction that will have losses in one year. Similarly, current loss-carryforward firms are more likely to have loss carryforwards again next year than ten years hence. Whether a firm has tax losses today is therefore a better predictor of its tax status during the relevant years for equipment allowances than for structures.



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