Tax policy: its impact on investment incentives

The sluggish growth of business investment has been a disappointing feature of the current recovery. This situation has caused widespread concern. Vigorous business investment is important not only to maintain the momentum of the recovery but also to increase the productive capacity of the economy.

Some have argued that the tax system coupled with inflation creates disincentives to invest in capital goods such as plant and equipment. Others have said that businessmen regard the outlook as uncertain and are reluctant to invest for this reason. While there may not be agreement on the precise causes of the slow growth of investment spending, most experts agree that certain types of tax change would act as a spur to business purchases of equipment, plant, and offices. This article discusses four types of tax change They include a reduction in the corporate tax rate and an increase in the investment tax credit, both part of the Administration's proposed tax reduction package, a shortening of the service lives that businesses may use to depreciate capital; and a reduction in the taxation of capital gains (box on definitions).

Tax policy: a brief history

These four tax provisions have undergone many changes over time. In the majority of cases, the change has lowered taxes. Since World War II, for example, the four structural features of taxation examined here have been altered about twenty times, with Treasury revenues being raised in less than half the cases. The few occasions when business taxes were raised almost always coincided with periods of war.

The corporate tax rate has been changed frequently to stimulate or to restrain economic activity. The rate was lowered immediately after World War II, in part as an attempt to head off an expected recession. Then, during the Korean war the corporate tax rate was raised to finance the increased defense expenditures and to reduce inflationary pressures. In addition, an excess profits tax, which effectively raised the corporate tax rate, was levied from 1950 through mid-1953 The next changes occurred in 1964 and 1965 when the rate was lowered in two steps as part of the Revenue Act of 1964, aimed at stimulating economic growth. The subsequent buildup of inflationary pressures in the middle and late 1960's led to the imposition in 1968 of a 10 percent tax surcharge which effectively raised the corporate tax rate. This surcharge expired in 1970. In 1975, the tax rate on the first $50,000 of corporate taxable income was reduced to help push the economy out of recession.

The investment tax credit is a relatively new device, first introduced in 1962. It has been applied almost exclusively to expenditures on machinery and equipment. The tax credit cannot be applied to investment in structures, except for research and certain storage or special purpose facilities. Purchases of up to $100,000 of used machinery and equipment can qualify for the credit. The credit was established at a rate of 7 percent. Public utilities, however, were permitted to claim a tax credit of only 3 percent. (This was raised to 4 percent in 1971.)

Initially, the tax credit had to be deducted from the purchase price of the asset to arrive at a basis for the calculation of depreciation allowances. This feature, known as the 'Long Amendment", reduced the credit's effectiveness and apparently also complicated taxpayers' bookkeeping practices. Because of these reasons, in 1964 the deductibility requirement was eliminated. The investment credit was temporarily removed twice in the past ten years, from October 1966 to March 1967 and from April 1969 to August 1971, to

help combat inflation. In 1975 as part of the anti-recessionary fiscal program, the credit, including that for public utilities, was raised to 10 percent. It is scheduled to revert to 7 percent in 1981, with the exception of utilities for which the credit is scheduled to revert to 4 percent.

The investment tax credit has always been subject to certain restrictions. To encourage long-term investment, the 10 percent credit is available only for equipment with at least a seven-year service life, *i.e.,* the period of time over which a capital asset is depreciated. Investment in equipment with a service life of three to four years is eligible for one third of the full investment tax credit; a service life of five to six years, for two thirds of the full credit.

A practical limitation is that there must be a sufficiently large tax liability for the investment tax credit to offset. For most industries, the credit can be used to offset the first $25,000 of tax liability and then only 50 percent of the liability above $25,000. Utilities, railroads, and airlines are permitted temporarily to use the credit to offset a larger percentage of tax liability. Excess credits, the amount of credit which exceeds the allowable tax offset, can be applied to tax liability three years back or seven years into the future.

The allowable deduction for depreciation, *i.e.,* for wear and tear of equipment and structures, has been changed several times to provide additional investment incentives. The original provision for the calculation of depreciation allowances specified only the use of the straight-line method. In 1954, accelerated methods of calculating depreciation allowances, the declining-balance and sum-of-years-digits methods, were authorized.[1] Since then, these and the straight-line method have been the standard methods of calculating depreciation allowances (box on page 32) [2]

Further liberalization of the depreciation allowances deduction has been accomplished through the shortening of the suggested service lives of capital assets. Suggested service lives to be used in the calculations were first provided in 1942, with the publication of Bulletin F. During World War II and the Korean war, a five-year amortization was made available for investment in defense facilities. (The second episode of the fast amortization continued until 1959.) The first general shortening of suggested service lives occurred in 1962 when the Internal Revenue Service (IRS) authorized a new set of guideline service lives for broad classes of assets. Suggested service lives for equipment were reduced by 30 to 40 percent from the former guidelines; service lives of structures were not changed significantly.[3] Additional shortening of service lives was permitted in 1971 under the "asset depreciation range" system, which permitted firms to use service lives for machinery and equipment that differed by 20 percent from the 1962 guidelines. Moreover, since 1969 a five-year write-off period has been available to certain investments deemed to have high social priority. However, it applies to only a small fraction of total investment and, in almost all cases, the investment tax credit by law cannot be applied to those investments which are depreciated over this special five-year

Definitions

Corporate tax rate. The tax rate that corporations apply to taxable income for determining tax liability, before adjustment for foreign tax credit, investment tax credit, or employment tax credit.

Investment tax credit. The proportion of the cost of a capital good that can be used directly to reduce tax liability.

Depreciation allowances. The deduction for wear and tear and obsolescence of capital goods and structures in cases where the estimated useful life of the item exceeds one year. The annual depreciation deduction depends on:

(a) the purchase price of the capital good;
(b) the service life of a capital good: the number of years over which the capital good will be productive,
(c) the salvage value of the capital good at the end of its service life;
(d) the method of depreciation: the three standard methods are straight-line, declining-balance, and sum-of-years-digits.

Capital gains tax. The tax that is levied on the increase in the value of an asset if the asset is held over a span of time at least as long as the minimum time required by law. The tax is not incurred until the asset is sold and the increased value is realized.

[1] There are several other principal depreciation methods, but they are used mainly for special types of capital goods or in particular cases Alternatively, any other consistent depreciation method can be used so long as it does not generate more depreciation deductions than the declining-balance method during the first two thirds of the service life of the capital good

[2] New residential buildings are permitted to be depreciated at a rate of up to 200 percent of the straight-line rate (the double declining-balance method) or by the sum-of-years-digits method Nonresidential buildings can be depreciated at 150 percent of the straight-line rate, and used residential buildings at 125 percent of the straight-line rate Depreciation of used nonresidential buildings is restricted to the straight-line method

[3] A H Young, "Alternative Estimates of Corporate Depreciation and Profits Part 1", *Survey of Current Business* (April 1968).

Methods of Calculating Depreciation Allowances

Three standard methods of calculating depreciation allowances are widely used. They are straight-line, declining-balance, and sum-of-years-digits The table shows the patterns of depreciation allowances produced by these three methods for an asset worth $1,000 with a service life of ten years and a salvage value of zero.

The straight-line method distributes the value of the asset evenly across its service life. In the current example, the annual depreciation allowances equal 10 percent of the asset's value, or $100.

The declining-balance method applies a particular depreciation rate to the undepreciated value of an asset remaining each year. For instance, the double declining-balance method applies twice the straight-line rate to the undepreciated value. In the example, the double declining-balance applies a rate of 20 percent to $1,000, in the first year ($200), then 20 percent to $800 in the second year ($160), etc. A taxpayer using the declining-balance method has the option of switching to straight-line in any year. In the present example, this becomes profitable to do in the seventh year of the service life. Under the asset depreciation range system, a taxpayer also has the option to switch from the declining-balance method to the sum-of-years-digits method. This is profitable to do in the second year of the service life.

The sum-of-years-digits method determines the depreciation rate as the ratio of the service years remaining to the sum of the numbers from one to S, the service life. In the current example, the sum of the numbers from 1 to 10 equals 55 Hence, in the first year the depreciation rate is 10/55, in the second year 9/55, in the third year 8/55, etc.

It is apparent from the table that the declining-balance and the sum-of-years-digits methods involve larger depreciation allowances early in the life of the capital good. Compared with straight-line, the two accelerated methods yield higher depreciation allowances over the first 40 or 50 percent of the service life and lower allowances thereafter. This is reflected by the present values of the depreciation allowances associated with the two accelerated methods exceeding that of straight-line depreciation.

Three Methods of Depreciation for a Ten-Year, $1,000 Asset

In dollars

	Depreciation method		
Year	Straight-line	Double declining-balance	Sum-of-years-digits
1	100	200	182
2	100	160	164
3	100	128	145
4	100	102	127
5	100	82	109
6	100	66	91
7	100	65 5	73
8	100	65 5	55
9	100	65 5	36
10	100	65 5	18
Total	1,000	1,000	1,000
Present value of depreciation allowances using a discount rate of 8 percent	671	733	748

Source J Pechman, *Federal Tax Policy* (Third Edition, The Brookings Institution, 1977).

period.[4] Taxpayers are permitted to specify service lives shorter than those suggested by the IRS if adequate justification is shown.

Long-term capital gains have been treated differently from ordinary income since the early years of the Federal income tax For most of the postwar period—up until the end of 1976—long-term gains were defined as gains on assets held more than six months. Until 1969, a taxpayer, whether an individual or a corporation, could choose between two methods of computing the tax on realized long-term capital gains. One method was to include half (all, for corporations) of these gains in taxable income; for an individual, this was equivalent to a tax rate on the total gains equal to 50 percent of the marginal rate. The other method was to apply an "alternative" tax rate of 25 percent to *total* realized long-term capital gains.

The Tax Reform Act of 1969 made several changes which effectively raised the marginal tax rate on large realized long-term capital gains. For one thing, the alternative tax rate was raised to 30 percent for corporations Second, for individuals, the alternative tax rate

[4] The Administration proposes to extend the entire investment tax credit to pollution-control equipment, regardless of the five-year amortization period for which this equipment is eligible

was restricted to the first $50,000 of realized long-term capital gains; half of any realized long-term capital gains in excess of $50,000 was treated as ordinary income. Third, for individuals with large amounts of income subject to preferential taxation, a minimum tax was applied to the preferentially taxed income;[5] half of the realized long-term capital gains in excess of $50,000 was regarded as preferential income for these computations. Finally, individuals with earnings which were being taxed at the maximum earnings tax rate of 50 percent would have to apply higher marginal tax rates on some of those earnings to the extent that their preference incomes were greater than $30,000.

The most recent changes in the taxation of capital gains were made in the Tax Reform Act of 1976. The holding period defining a long-term capital gain was lengthened to nine months for gains realized in 1977 and to twelve months thereafter. In addition, the minimum tax on preference income was raised and the $30,000 exemption was eliminated from the preference offset to the maximum tax.

Last January, the Administration proposed a package of business tax changes. The major components of the package were as follows. The corporate tax rate would be reduced from 20 percent to 18 percent on the first $25,000 of corporate income, from 22 percent to 20 percent on the second $25,000, and from 48 percent to 45 percent on income over $50,000. (Effective January 1, 1980, the maximum corporate rate would be reduced to 44 percent.) In addition, the investment tax credit would be extended to utility and industrial structures and to certain pollution-abatement facilities and made permanent at the current 10 percent rate. The credit would be allowed to offset up to 90 percent of the tax liability otherwise owed. (The investment tax credit liberalization would also apply to individual income taxes on business income.) However, the Administration also recommended that the use of accelerated depreciation methods for real estate, with the exclusion of low-income and new multifamily housing, be prohibited and that businesses be required to use more realistic service lives in calculating the depreciation of buildings. The latter two proposals would tend to reduce the incentive to invest in structures, but they were introduced as ways to make the tax depreciation correspond more closely with the true economic depreciation. In addition, the Administration proposed to eliminate the alternative tax on capital gains and to increase the amount of preferential income that would be subject to the minimum tax. These proposals are now in a state of flux. The Administration has reduced the size of the proposed tax cut, and there is strong support in the Congress for a capital gains tax reduction.

Taxes: their impact on a firm's investment decision

Before discussing how various proposed tax changes affect a firm's decision to invest, it should be pointed out that the currently high inflation rate tends to raise the effective tax rate on income from capital and thus dampens the incentive to invest.[6] The effective tax rate rises in an inflationary setting primarily for two reasons: inventories increase in value because of higher prices, and the resultant gain is taxed as ordinary income; and depreciation allowances, being based on original book value, tend over time to understate true depreciation, and therefore their value as a tax deduction declines. Consequently, a tax cut is needed just to maintain the level of investment incentives. How, then, do different types of tax reduction actually affect a firm's decision to invest?

A reduction in the corporate tax rate increases a firm's aftertax earnings. It thereby raises the expected net aftertax return from an investment in corporate plant, equipment, or other useful capital goods. These new capital goods, together with labor, materials, etc., allow a firm to increase its output and sales. With a lower tax rate, a firm is permitted to keep a larger fraction of the profit from this new endeavor and thus is given an incentive to expand.

The investment tax credit, by reducing tax liability when a firm purchases an eligible investment good, effectively lowers the price of the new capital good by the same percentage as the credit. Firms probably regard the investment tax credit as more certain than the tax savings associated with a tax rate cut, because the entire tax credit is generally taken immediately whereas the total impact of a tax rate cut depends on future income.

There is, however, some restriction on the credit's use—there must be a sufficient tax liability against which the credit can be applied. But the impact of this restriction is not so great as might appear at first glance. For one thing, the credit may be applied against taxes paid in the three previous years. The major drawback of the carry-back feature is that it entails a great deal of complicated accounting. There is also a carry-forward provision which allows the credit to be saved for up to seven years. This is not so useful

[5] "Preferentially taxed" income includes, among other things, half of realized long-term capital gains excluded from taxable income, itemized deductions (other than those for medical expenses and casualty losses) in excess of 60 percent of adjusted gross income, and depletion deductions in excess of the amount that would be allowed on the basis of cost

[6] See P J Corcoran, "Inflation, Taxes, and Corporate Investment Incentives", *Quarterly Review* (Autumn 1977), pages 1-10

as the carry-back provision, because firms prefer to receive the tax credit earlier rather than later. A delay in receiving the credit precludes a firm's earlier use of the money and also introduces the possibility that the level of its taxes in the future, after deducting the tax credits for future new investment, will not be high enough to utilize the credit even then.

It is possible for firms to collaborate with each other to receive the full amount of the credit. For instance, a firm, which because of insufficient tax liability against which to apply the credit cannot immediately obtain the investment tax credit, can arrange to have the piece of equipment purchased by another firm that is in a position to obtain the tax credit. The equipment then can be leased at a special rental rate to the company that needs it. The extent to which the rental rate is set below the usual market rate on such equipment depends on the negotiated division of the tax credit between the two firms.

Of course, all the devices to use the credit when the current year's liability is insufficient involve some cost to firms. The Administration's proposal to raise the ceiling on the permissible tax offset to 90 percent is meant to reduce the need for firms to resort to these devices.

Unlike a cut in the corporate tax rate or an increase in the investment tax credit, the shortening of service lives for depreciation allowances does not constitute a reduction in the cumulative dollar amount of a firm's tax liability over the service life of a capital good. Instead, it changes the timing of the payment of tax liability, reducing the payment during the early years of service life and enlarging the payment during the later years. In effect, it represents an interest-free loan from the government. The value of different streams of depreciation allowances can be measured by scaling-down or "discounting" future depreciation and summing each year's discounted depreciation. (This sum is called the "present value".) Because it allows the depreciation to be taken earlier, a shortening of service lives raises for the firm the present value of the depreciation allowances associated with an investment.

So far, the tax provisions examined have applied directly to business. A reduction in the tax rate on realized long-term capital gains, in contrast, affects mostly individuals but can also influence a firm's decision to invest Because the aftertax value of realized capital gains is increased, stock ownership is made more attractive to investors. Stock prices would be bid up, enabling corporations to obtain more new money per extra share issued and thus make the financing of new investment easier and less costly. This would be particularly true for newly started companies with good prospects.

The relative effectiveness of tax policies

It is apparent from the above discussion that the tax system can be used in a number of ways for the purpose of providing investment incentives. Which way is the most effective? Which kind of tax change has the greatest impact per dollar of revenue foregone—which gives the biggest "bang per buck"? Our discussion will concentrate on a corporate tax rate cut, an increase in the investment tax credit, and a service lives reduction for tax depreciation purposes. These three types of tax changes can easily be compared, because both their direct revenue effects and their incentive effects can be analyzed in similar ways.

In contrast, the evaluation of the incentive impacts of a capital gains tax change is too complex for precise calculations. The channel through which a capital gains tax cut affects the decision to invest is indirect, for it is investors of funds who are directly affected, and it is their valuation of and response to the tax cut, both of which are highly uncertain, that determines the extent to which firms would find financing easier and thus investment more attractive. However, a number of general statements can be made. The capital gains tax applies to many kinds of assets such as corporate stocks, houses, and land and to gains accrued over the past. Thus, a reduction in the gains tax would not flow entirely to new investment, which would tend to lessen the tax cut's incentive impact on businesses' decision to invest. On the other hand, new firms with bright prospects but little current income, which therefore would not benefit from the other types of tax cut, might benefit from a capital gains tax reduction. Such firms might find raising capital funds easier if their prospective capital gains were to be taxed at a lower rate.

For the other three types of tax cut, the comparison is based upon the degree of stimulus per dollar revenue loss provided by each change in tax policy. Of course, the extent to which firms respond to any of the three tax changes depends upon a number of things including the need to increase productive capacity, the degree of substitutability between capital and labor in the production process, and the degree of substitutability between domestic and foreign investment. These issues are beyond the scope of this article In addition, if the tax cut were temporary, then firms might change the timing of their capital expenditures to take advantage of the tax savings. In particular, if the tax cuts were in the form of a temporarily higher investment tax credit or temporarily shortened service lives, there would be a short-run spurt in investment, which would be offset by lower than otherwise capital spending after the tax cut expired The tax cuts in the present analysis are assumed to be permanent.

A comparison of a corporate tax rate cut, an increase in the investment tax credit, and a service lives reduction begins with the observation that all three lower government revenue and raise businesses' after-tax income One factor in the comparison is whether a tax cut is directed at both old and new capital or only at capital accumulated after the tax change Based upon this consideration, in the long run, when the entire capital stock is replaced, all three types of tax reduction would be essentially equivalent in terms of stimulating investment. In the short run, however, the corporate tax rate reduction benefits profits stemming from capital accumulated prior to the tax change as well as profits attributable to new investment in fixed capital. Hence, the old capital absorbs much of the tax cut, diverting it from new investment With an increase in the investment tax credit and a service lives reduction, the tax cut is directed almost entirely at new capital at the outset. Consequently, in the near term these two types of business tax break provide more investment stimulus than a corporate tax rate cut per dollar of revenue given up by the government. These two tax cuts, however, differ in their timing. For this reason, they might differ in impact

Can we tell which of these two types of tax cut is more effective? The effectiveness of a tax cut is measured by comparing its value to businesses with its cost to the United States Government In the case of the investment tax credit, we assume for the sake of simplification that the entire impact is in the first year of the investment[7] If, for example, $5 billion is used to give new investment tax credits, then businesses gain $5 billion worth of investment incentive and the Treasury loses $5 billion in revenue. The ratio—a measure of the stimulus per dollar lost—is therefore unity in the case of an investment tax credit increase.

In the case of a reduction in service lives that may be used for depreciation, there will be an alteration in a firm's taxes beginning in the current year and extending over the remainder of the life of the capital good. During the early years of the good's life, a business will pay lower taxes, while during the later years there will be less depreciation to take and tax payments will be higher. Although the *sum* of dollars lost by the government equals the sum of dollars gained by business, the *value* placed on the stream of tax payments may not be the same by the two parties. The value placed upon a stream of income depends upon the weight placed upon the future versus the present. If business places one weight on the future and the government places a different weight on it, then the *value* of a service lives reduction would be different for business than it is for the government. Thus the ratio of the value to business versus the value to the government of a service lives reduction could be different from unity—it could be bigger or smaller.

If the government and business weigh the future equally, the service lives reduction yields a present value of tax savings to business which is exactly equal to the present value of revenue loss to the government. (Present value is the term used to denote the value today of a future income stream, see page 34.) Thus, for this case the service lives reduction would have an effectiveness of unity and, hence, there would be no difference between the effectiveness of an increase in the investment tax credit or a service lives reduction (box on page 36).

Next, consider the case where businesses weigh the future less than the government. Then, businesses would value the additional tax payments late in the capital good's life from a service lives reduction less than government counts the additional tax revenues Hence, the present value of firms' tax savings from a service lives reduction would be greater than the present value of tax losses to the government. An extreme example occurs where business discounts the future to some extent, but the government does not discount the future at all Because a service lives reduction changes only the timing of tax payments, but not the cumulative amount, the present value of the revenue loss to the government in this case is zero. Businesses still would benefit from the service lives reduction, though, because the present value of their tax savings is greater than zero. Thus, when businesses weigh the future less than the government, the ratio of the present value of businesses' tax savings to the present value of the government's revenue loss is greater than unity. In such a case, shortening service lives is more effective than an increase in the investment tax credit.

The comparison is not so clear-cut when businesses weigh the future more than the government. Over a wide range of differences between the weights businesses and the government assign future income, businesses would value the higher future tax payments more than the government would value future additional tax receipts. In other words, the present value of the tax savings to businesses from a service lives reduction would be smaller than the present value of tax revenue loss to the government, and the measure of effectiveness would be smaller than unity. In this case, a service lives reduction would be less effective than an increase in the investment tax credit.

When the government, however, assigns exceptionally little weight to future income, compared with business, then the government would discount by more than

[7] The following results would be modified only slightly if firms had to "carry forward" the tax credit or "share" it with another firm

businesses not only the higher future tax receipts but also the lower tax receipts in the near to medium term. This could cause the present value of tax payments to businesses to be above the present value of tax revenue loss to the government. Such a result could occur, for instance, when the government is concerned only about the revenue loss in the first year of the tax cut Thus, in such extreme cases when businesses value future income extraordinarily more than the government, a service lives reduction could be relatively more effective than an increase in the investment tax credit.

There is no way of determining whether business or the government weighs the future more. Some considerations suggest that businesses may regard the future as more uncertain and discount it more than the government. For example, the range of profit variation for a single firm is larger than the average profit variability in the economy as a whole. This suggests that the firm would be more uncertain about its income than the government whose revenue is based in part upon total profits in the economy However, taking other factors into account, the government may actually weigh the future less than business does. The state of the economy and political considerations are two factors that might figure in the government's emphasizing the present versus the future. On balance, however, it seems reasonable to conclude that the government and businesses, reflecting society's judgments, view the future similarly. Consequently, in most circumstances a service lives reduction and an increase in the investment tax credit are equally effective and efficient in providing additional investment incentives.

Relative Effectiveness of an Increase in the Investment Tax Credit and a Shortening of Service Lives for Depreciation Calculations

Businesses weigh the future less than does government	Businesses and government assign the same weight to the future	Businesses weigh the future more than does government
Shortening of service lives is more effective in providing investment incentives	Shortening of service lives and increase in investment tax credit are equally effective in providing investment incentives	In most cases, increase in investment tax credit is more effective in providing investment incentives. In extreme cases, shortening of service lives may be more effective in providing investment incentives.

Conclusion

Tax policy has many purposes. Besides the obvious one of raising revenue, taxation affects the distribution of income, the allocation of resources, and the amount and composition of spending. For example, a corporate tax rate cut can provide added incentives to a wide range of business activities, not just to those which rely heavily on fixed capital. An investment tax credit increase and a service lives reduction, on the other hand, benefit almost entirely new fixed capital. As a result, these two tax changes may be more favorable to certain industries and regions. In deciding on tax changes, all these factors must be taken into account.

The analysis presented here focused on only one objective, the desire to spur business investment. From this vantage point, a capital gains tax reduction is likely to have a favorable impact on businesses' decisions to invest, but the channel through which this occurs is largely indirect and highly uncertain. Three other types of tax reduction were examined in terms of their ability to provide additional investment incentives at the least cost to the Treasury. Of these, a corporate tax rate cut is the least effective in providing additional investment incentives per dollar revenue loss to the Treasury. Shortening service lives for depreciation purposes and increasing the investment tax credit are better ways of achieving this goal.

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