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THE INDEXATION OF INTEREST, DEPRECIATION, AND CAPITAL GAINS AND TAX REFORM IN THE UNITED STATES

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The Treasury's 1984 tax plan suggests features of a comprehensive income tax, including the indexation of interest, depreciation, and capital gains. The 1985 President's proposal retains some of these indexing provisions, but the Tax Reform Act of 1986 does not. This paper looks at the incentives under these tax regimes to make marginal investments in the corporate sector, noncorporate sector, and owner-occupied housing. It finds that inflation in the old system caused effective tax rates to rise for some assets and fall for others. Under the Treasury or President's proposals, the interference of inflation is virtually eliminated. Also, the effects of inflation are substantially reduced by the 1986 Act, because mismeasured depreciation and interest deductions are taken at much lower rates.

1. Introduction

The U.S. Treasury Department in November 1984 announced their proposal for a more comprehensive tax on income. Their plan, described in *Tax Reform for Fairness, Simplicity, and Economic Growth,* is a 'modified flat tax' in the sense that it would broaden the base and lower the rates. It would involve sweeping changes to fringe benefits, charitable contributions, and other deductions. It would also partially integrate corporate and personal taxes. Perhaps the most innovative and difficult features of the plan, however, are the attempts to measure a real tax base through the indexation of interest, depreciation, and capital gains.

This paper concentrates on the provisions that would affect taxes on income from capital, including (1) the reduction of the corporate rate from 46 to 33 percent, (2) the reduction of personal rates from a range of 11–50 percent to three brackets of 15, 25, and 35 percent, (3) the elimination of the

60 percent capital gains exclusion and indexation of basis, (4) the 50 percent dividend deduction, (5) the indexation of interest, (6) the repeal of investment tax credits, and (7) the indexation of allowances for economic depreciation.

These provisions make the original Treasury proposal interesting as a subject of economic investigation, despite its lack of political viability. In May 1985, the Administration released the *President's Tax Proposals to the Congress for Fairness, Growth, and Simplicity*. This plan would keep the Treasury's corporate and individual rates, but it retreats on the capital gains and interest indexation provisions. It accelerates the indexed depreciation allowances and reduces the dividend deduction to 10 percent. The final Tax Reform Act of 1986 dropped depreciation indexing as well. It has no dividend deduction, a top corporate rate of 34 percent, and two personal rate brackets of 15 and 28 percent (although the effective marginal rate can be 33 percent).

For alternative special cases and assumptions, this paper measures investment incentives afforded by the old tax system and by these other tax regimes. It follows Hall and Jorgenson (1967) by finding the user cost of capital or pretax return that is required for a marginal investment under each regime. The proportional difference between the pretax return and the posttax return for each project provides a marginal effective tax rate along the lines of Auerbach and Jorgenson (1980), Gravelle (1982), Hulten and Robertson (1984), King and Fullerton (1984), or Fullerton and Henderson (1984).

Like King and Fullerton (1984) (hereafter KF), this paper assumes equilibrium in capital markets with perfect competition, mobility, and certainty. It also includes all interactions among corporate taxes, personal taxes, and state and local property taxes. However, the KF model considered only one set of arbitrage conditions, three assets, and three industries in the corporate sector. This paper considers two separate sets of arbitrage conditions as described below. Results are somewhat sensitive to this choice. Second, it expands to 36 different assets in 18 different industries. Third, it looks beyond the corporate sector to consider taxation of capital in the noncorporate sector and owner-occupied housing. This addition is important because the corporate sector contains only 37 percent of the U.S. capital stock. Another 37 percent is in the noncorporate business sector including rental housing, while the final 26 percent is in owner-occupied housing. Fourth, the model is generalized to accommodate any indexed or unindexed provisions for depreciation, interest, or capital gains. It can also allow alternative dividend provisions. Finally, of course, the paper provides new results for the two proposals and the final legislation.

For the old law, results may be summarized by three main points. First, the marginal effective total tax rate is about 30 percent, much lower than the 70 percent average effective total tax rate for the corporate sector found by

Feldstein, Dicks-Mireaux, and Poterba (1983).[1] Second, for 'standard' assumptions, the corporate tax is found to add nothing to the overall rate on marginal investment, because it is completely offset by credits, allowances, and interest deductions. Third, as inflation increases, some effective rates rise while others fall. Overall, taxes fall with inflation, in contrast to results of Feldstein and Summers (1979).

Three points also may be made about the reforms. First, under almost any set of assumptions, the corporate tax would re-emerge and thus raise effective tax rates. Second, the plans would significantly level the tax treatment of different assets. They would eliminate subsidies to equipment and debt financed investment, and they would reduce the high rates on nondepreciable assets and equity financed investments. Third, the two proposals virtually eliminate the dependence of effective tax rates on inflation, and the 1986 Act substantially reduces it.

Section 2 describes the model and section 3 provides detail on tax parameters and proposed tax regimes. Section 4 describes results, and section 5 concludes.

2. A model of investment incentives

Consider a perfectly competitive firm contemplating a new investment in a world with no uncertainty. Assume the firm has sufficient tax liability to take associated credits and deductions, and that it does not resell the asset.[2] An investment tax credit reduces the asset's net cost by rate k; inflation is constant at rate π; and the asset depreciates at exponential rate δ. The corporate income tax is levied at statutory rate u, and local property tax at rate w is deductible against it. Net returns are discounted at the firm's nominal after-tax discount rate r, and the present value of depreciation allowances per dollar of investment is z.[3] In equilibrium, the net outlay must be exactly matched by the present value of net returns. This condition can be used to solve for ρ^c, the real social rate of return in the corporate sector,

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[1]The average effective tax rate takes observed taxes as a fraction of current capital income. Fullerton (1984) reviews alternative definitions of effective tax rates, and explains some of the differences among them.

[2]Effective rates for an untaxed corporation are shown in subsection 4.4. Uncertainty and imperfect loss offsets are investigated in Auerbach (1983). This assumption also excludes the minimum tax and passive loss rules of the 1986 Act.

[3]For a variety of reasons not captured here, firms may not always minimize their taxes by taking the earliest possible deductions. In order to concentrate on the tax wedge and to insure comparability across tax regimes, however, calculations here assume tax minimizing behavior. Similarly, firms pay unnecessary taxes by using FIFO inventory accounting, but standard calculations here assume LIFO methods. Sensitivity to this assumption is investigated in subsection 4.4.

gross of tax but net of depreciation:

$$\rho^c = \frac{r - \pi + \delta}{1 - u}(1 - k - uz) + w - \delta. \tag{1}$$

In calculations below, common values are used for r, π, and u, but each asset has a specific value for δ, k, z, and w. If u and the corporate discount rate are replaced by the noncorporate entrepreneur's personal marginal tax rate τ_{nc} and corresponding discount rate, then (1) gives an analogous expression for ρ^{nc}, the social rate of return in the noncorporate sector.

Owner-occupied housing receives no credit or depreciation allowances, and the imputed return is not taxed. A fraction λ of property taxes is deducted at the homeowner's personal marginal tax rate τ_h. Use of the homeowner's discount rate provides ρ^h, the social rate of return to owner-occupied housing:

$$\rho^h = r - \pi + (1 - \lambda\tau_h)w. \tag{2}$$

For the basic set of calculations, assume that the firm can arbitrage between debt and real capital, as in Bradford and Fullerton (1981). Suppose that i is the nominal interest rate and f is the fraction of nominal interest receipts that is taxed (and of nominal interest payments deducted).[4] The corporation can save $i(1 - uf)$ by retiring a unit of debt, so any marginal real investment must earn the same rate of return in equilibrium. All nominal net returns are then discounted at the rate $r = i(1 - uf)$, whatever the source of finance. The other two sectors have analogous discount rates.

A fraction c_d of corporate investment is financed by debt, and the personal marginal rate of debtholders is τ_d. The net return to debtholders is thus $i(1 - \tau_d f)$. A fraction c_{re} of corporate investment is financed by retained earnings, and the return after corporate taxes $i(1 - uf)$ results in share appreciation that is taxed at the effective accrued personal capital gains rate τ_{re}. Also, let γ represent the extent to which capital gains are indexed ($\gamma = 1$ if the system taxes only real capital gains, and $\gamma = 0$ if it taxes nominal gains). The net return to the shareholder is then $i(1 - uf)(1 - \tau_{re}) + \tau_{re}\pi\gamma$. The remaining fraction c_{ns} of corporate investment is financed by new shares, where each dollar of after-corporate-tax return could instead be distributed as θ dollars of dividends.[5] These dividends are subject to personal taxes at rate τ_{ns}, so the net return is $i(1 - uf)\theta(1 - \tau_{ns})$. In combination, the real net return in the

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[4]This fraction is 1.0 under all regimes except for the Treasury proposal, as shown below.

[5]As in King (1977), θ is the opportunity cost of retentions in terms of forgone dividends (gross of personal taxes). It is 1.0 under old law and the 1986 Act, but greater than one where a dividend deduction allows firms to pay more in dividends than they could retain after tax.

corporate sector is[6]

$$s^c = c_d[i(1 - \tau_d f)] + c_{re}[i(1 - uf)(1 - \tau_{re}) + \tau_{re}\pi\gamma]$$

$$+ c_{ns}[i(1 - uf)\theta(1 - t_{ns})] - \pi. \tag{3}$$

The total effective marginal tax rate in the corporate sector, including all corporate, personal and property taxes, is $(\rho^c - s^c)/\rho^c$, the tax wedge as a fraction of the pretax return. Similar expressions for the noncorporate sector and owner-occupied housing are detailed in Fullerton (1985).

Under the assumption of firm arbitrage, savers receive different rates of return on debt and equity. In an alternative special case tested in section 4.3 below, individuals are assumed to arbitrage away these differences. All assets must then provide $s = i(1 - \tau_d f) - \pi$ to the saver. In this case, however, the corporation must earn more on its investments financed by equity than on those financed by debt.[7] Clearly, the two arbitrage assumptions are not consistent with one another. They could probably be reconciled in a more complete theory with uncertainty and transactions costs, where either a firm or an individual would simultaneously hold assets with different rates of return. This paper abstracts from financial portfolio choice, however, in order to concentrate on real investment. Both alternatives are used in calculations below, because either can hold in this perfect certainty model.[8]

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[6]In eq. (3), the nominal return to new equity is paid as dividends. When the firm chooses whether to retain the inflationary part of this return, it makes a choice about the weights c_{re} and c_{ns}.

[7]With individual arbitrage, the corporation's discount rate for debt is $i(1 - uf)$. Retained earnings must earn a return r such that the individual's return $r(1 - \tau_{re}) + \tau_{re}\pi\gamma$ exactly matches $i(1 - \tau_d f)$. The solution for r provides the requisite discount rate. Similarly, new share issues must earn an r such that $r\theta(1 - \tau_{ns}) = i(1 - \tau_d f)$. The corporation's single discount rate is a weighted average of these three:

$$c_d[i(1 - uf)] + c_{re}\left[\frac{i(1 - \tau_d f) - \tau_{re}\pi\gamma}{(1 - \tau_{re})}\right] + c_{ns}\left[\frac{i(1 - \tau_d f)}{\theta(1 - t_{ns})}\right].$$

Similar expressions for the other sectors appear in Fullerton (1985).

[8]On the one hand, individual arbitrage implies that a project financed by equity must earn a higher marginal product than the same project financed by debt. This scenario can be justified in a perfect certainty model, but only if the firm must use a given mix of finance. On the other hand, if firms can choose their source of finance, then they must arbitrage away differences in their rates of return to each. Any individual would then earn a higher return on debt than on equity. This latter scenario can be justified in a perfect certainty model, but only if no individual holds both debt and equity. Indeed, Miller (1977) suggests a segmented equilibrium where lower bracket taxpayers hold only debt and higher bracket taxpayers hold only equity. Note, however, that the margin in Miller (1977) is quite different from the margin in this paper. He was concerned with the determination of debt/equity ratios and the rate bracket that divides debtholders from shareholders. This paper considers a marginal investment financed by selling more debt to all debtholders and more equity to all shareholders, in proportion to their holdings.

Finally, define (K^c, K^{nc}, K^h) as the shares of the capital stock, and (s^c, s^{nc}, s^h) as the returns net of all tax, in the corporate, noncorporate, and owner-occupied housing sectors, respectively. The overall net return is

$$s = s^c K^c + s^{nc} K^{nc} + s^h K^h. \tag{4}$$

The overall marginal investment is taken to be an equiproportional increase in all assets and in all personal savings.

In this comprehensive model, all investors (firms) and all savers (individuals) are tied together through a single interest rate. The tax rules and relative sizes of different investments help determine the relationships among the pretax returns ρ, the interest rate i, and the post-tax returns s. In particular, the analysis could proceed by choosing i and π and then calculating the different ρ and s for each sector. The comparison of different tax regimes, however, requires careful choices for ceteris paribus assumptions. The nominal interest rate is determined in part by the rules of the tax regime, so it does not seem appropriate to fix i across regimes. The pretax returns ρ could be held fixed as in the KF model, but the leveling of different pretax returns is part of the point of tax reform. For these reasons, calculations in this paper start by choosing s and π. Eqs. (3) and (4) are then solved for the nominal interest rate i, and the appropriate discount rates are used in eqs. (1) and (2) to calculate the pretax returns. However, the constancy of s should be viewed as an arbitrary ceteris paribus assumption and not as a result for open or closed economies in general equilibrium.[9]

3. Data and parameters for the United States

This section describes the assignment of values to each of the parameters defined above. First, the stock of each asset used in each industry is borrowed from Dale Jorgenson, updated to 1984, and expanded to include housing.[10]

Little is known about how firms decide to finance marginal investments, but this study uses existing proportions as an indicator of marginal propensities. The market value of outstanding debt and equity are estimated from COMPUSTAT tapes, and annual retentions and new share issues are

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[9]The model in this paper is neither open nor closed per se; it simply chooses s by assumption. An explicit closed economy model would determine rates of return in equilibrium by the equality of savings and investment, as in Fullerton, Shoven and Whalley (1983). An open economy model would set rates of return internationally, as suggested by Broadway, Bruce and Mintz (1984), Gordon (1985), or Bosworth (1986). Note that the interpretation of total effective tax rates is more difficult in a completely open model where corporate tax incentives can encourage investment without more savings, and personal tax incentives can encourage savings without more investment.

[10]These capital stock data are described in Jorgenson and Sullivan (1981), Fraumeni and Jorgenson (1980), and the July 1985 Survey of Current Business.

taken from the *Flow of Funds* (see KF, p. 238). These data indicate that corporations finance 33.7 percent by debt, 61.4 percent by retentions, and 4.9 percent by new shares. Even less is known about the financing of non-corporate business and owner-occupied housing, but rough estimates suggest that both of these sectors also finance a third of their existing capital by debt.[11] The use of identical shares for debt in all three sectors will also serve to isolate and highlight the tax differences among them.

The property tax is collected by many local taxing jurisdictions. Some new businesses may receive special rebates or tax holidays, but new investments typically pay the same property tax over their lives as existing investments. Tax data from the Advisory Commission on Intergovernmental Relations and Jorgenson's capital stocks indicate average rates of 0.00768 for equipment and inventories, 0.01126 for business land and structures, 0.01550 for public utilities, and 0.01837 for residential land and structures.

Other parameters and features of the tax code are described in seven subsections that correspond to the components of tax reform listed in the introduction.

3.1. Corporate tax rates

The top federal statutory rate of 0.46 is used for marginal corporate income under the old (1985) law. State corporate taxes are deductible at the federal level, and the weighted average of states' top bracket rates is 6.6 percent (KF, p. 204). The appropriate value for u is therefore $0.46 + 0.066$ $(1 - 0.46)$, or 49.5 percent. The Treasury and President's proposals would set a top federal rate of 0.33 and maintain the deductibility of state corporate taxes. For these reforms u is 37.4 percent. With a 34 percent rate under the 1986 Act, u is 38.3 percent.

3.2. Personal tax rates

For households, income tax rates were calculated from the TAXSIM model of the National Bureau of Economic Research.[12] Marginal rates for 25,000 households are weighted by each different source of income and shown in table 1. Rates under old law in the first column indicate a 26 percent capital gains rate which reflects the full taxation of realized gains, and a 19.5 percent noncorporate rate which reflects the low brackets of many proprietors and partners with losses for tax purposes. The second column

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[11]Fullerton and Henderson (1984) describe these rough estimates. New real estate might be heavily debt financed, but the loan to value ratio falls as the mortgage ages. Proportions for all existing capital are appropriate because this study considers a permanent increase in the capital stock with fixed sources of finance.

[12]I am grateful to Lawrence Lindsey for performing all TAXSIM calculations. See Lindsey and Navratil (1985) for further description of this model.

shows the personal tax rates of the Treasury proposal, also used for the President's proposal.

Five percentage points are added to each federal rate of the first column to reflect the weighted average of states' rates and the deductibility of state taxes at the federal level (KF, p. 221). Six percentage points are added to the rates in the second column, to reflect the fact that both proposals would do away with this deductibility. Each personal rate is then adjusted to account for the taxation of banks, nonprofit institutions, and insurance companies (KF, pp. 223–226).[13] The final estimate for the old rate on interest income (τ_d) is 0.231, as shown in the third column of table 1. The rate for the proposals is 0.205, as shown in the fourth column. The 1986 Act has similar effective marginal rates but retains the deductibility of state income taxes, so the last column shows a 19.5 percent rate. The dividend rate τ_{ns} is 0.292 under old law, and 0.242 under the proposals, and 0.235 under the Act. The noncorporate rate is raised by state taxes, but not reduced by any holdings of institutions. It is 0.245, 0.218, and 0.208, respectively, under the old law, the proposals, and the Act.[14]

Table 1
Personal tax rates.

Type of income	From TAXSIM model[a] (federal only)		After adjustments[b] (federal plus state)		
	Old law	Proposals	Old law	Proposals	1986 Act
Wages and salaries[c]	0.254	0.208	0.304	0.268	0.258
Interest received	0.278	0.219	0.231	0.205	0.195
Dividends received	0.339	0.262	0.292	0.242	0.235
Capital gains	0.261	0.208	0.052	0.105[d]	0.091
Noncorporate income	0.195	0.158	0.245	0.218	0.208
Housing deductions	0.250	0.210	0.300	0.270	0.260

[a]Much help was provided by Lawrence Lindsey in providing all TAXSIM estimates.
[b]Adjustments are described in the text for the taxation at the state level, deferral of capital gains, and the taxation of banks, insurance companies, and nonprofit institutions.
[c]The tax rate on wages and salaries is provided for comparison purposes only.
[d]This 10.5 percent rate reflects full taxation of real capital gains after deferral.

[13]The appropriate marginal rate depends heavily on the nature of the margin under consideration. Here, the margin is a proportional increase in all saving and investment in the economy. Thus pension saving and individual retirement accounts are presumed to grow proportionately, even though some individuals may hit ceilings on those vehicles.

[14]The weighted average rate for mortgage interest deductions was 0.25 at the federal level, raised to 0.30 to account for state taxes. Also, the TAXSIM model indicates that $\lambda = 0.7$ of property taxes are deducted. The proposals would reduce τ_h to 0.27 and eliminate deductibility of property taxes ($\lambda = 0$). The 1986 Act retains property tax deductions ($\tau_h = 0.26$ and $\lambda = 0.7$).

3.3. Capital gains

The old law excludes 60 percent of long-term capital gains, and the effective tax is approximately halved again by deferral (KF, pp. 221–222). Even after adding state taxes, the effective rate on accruals is 5.2 percent after accounting for tax-exempt institutions and insurance companies. On the other hand, the old law taxes nominal capital gains ($\gamma = 0$). The Treasury proposal would lower personal rates and index for inflation, but it would fully tax real gains. After state taxes, halving for deferral, and averaging with institutions, τ_{re} would be 0.105 (with $\gamma = 1$). The President's proposal taxes 50 percent of nominal gains at reduced personal rates, so τ_{re} is 5.6 percent. After 1991, however, the investor can choose indexation in place of the exclusion. This model calculates the inflation rate at which this option would be taken. Finally, the 1986 Act has lower personal rates but no indexing and no exclusion (τ_{re} is 9.1 percent).

3.4. Dividends

Suppose a fraction g of dividends D is deductible against the corporate tax. For profits Y, the corporate tax is $u(Y - gD)$. Retentions are therefore $R = Y - u(Y - gD) - D$. This expression can be totally differentiated to obtain $|dD/dR| = \theta = 1/(1 - gu)$. No dividends are deducted under old law or the 1986 Act, so $g = 0$ and $\theta = 1$. With $u = 0.374$ and half of dividends deductible ($g = 0.5$) under the Treasury proposal, θ would be 1.230. With $g = 0.1$ under the President's proposal, θ is 1.039. Thus the firm can forgo a dollar of retentions and provide more than a dollar of dividends.

3.5. Interest indexing

Nominal interest income is taxed in the United States, so f is set to one. The Treasury recognizes the administrative difficulties of trying to measure real interest income or expense, and so it suggests a practical procedure. Using the inflation rate π and assuming a 6 percent real return, it approximates the inflationary portion of the nominal interest by $\pi/(0.06 + \pi)$. With 4 percent inflation, for example, the excluded part is 0.4 (and f is set to 0.6). All of mortgage interest on principal residences would still be deductible.

Incentive effects of the Treasury plan include the real effects of this approximation. To separate the effects of the approximation from the effects of interest indexing per se, calculations are also performed for a 'pure' version of interest indexing. Mortgage interest is left fully deductible, but equations are rewritten such that $(i - \pi)$ is deductible to the firm and taxable to the individual. Neither the President's proposal nor the 1986 Act would index interest.

3.6. Investment tax credits

The 1985 law provides a 6 percent credit for automobiles, a 10 percent credit for other equipment, a 10 percent credit for public utility structures, and no credit for buildings, inventories, or land. Both proposals and the 1986 Act would repeal these credits.

3.7. Depreciation

Different assets depreciate at many different rates, while tax codes tend to simplify by grouping assets into few categories for depreciation allowances. In order to capture resulting nonneutralities, it is important to include many diverse assets in the model. Table 2 lists the 36 assets used in this study, including 20 kinds of equipment, 14 types of structures, inventories, and land. This is a comprehensive list, but it still excludes intangible assets such as goodwill or technical knowledge. The economic depreciation rates δ are estimated by Hulten and Wykoff (1981). Inventories and land do not depreciate.

Under the old Accelerated Cost Recovery System (ACRS), autos are depreciated over 3 years, other equipment over 5 years, public utility structures over 10 or 15 years, and other structures over 18 years. Equipment and public utilities receive allowances based on 150 percent of declining balance with a switch at the optimal time to straight line. The depreciation basis is reduced by half the investment tax credit. Other structures receive allowances based on 175 percent of declining balance with an optimal switch to straight line.

These allowances are probably high relative to economic depreciation, but they are fixed in nominal terms. At moderate inflation rates, their real present value may be less than that of economic depreciation. The use of a nominal discount rate accounts for the fact that allowances are based on historical cost. The calculation of z also accounts for the half-year convention, annual allowances, and continuous discounting (KF, p. 211).

The Treasury proposes to set allowances as closely as possible to estimates of economic depreciation, indexed for inflation. In fact, for their Real Cost Recovery System (RCRS), they use the Hulten–Wykoff estimates to group similar assets into 7 classes. Each class has an exponential rate for allowances, and a year in which all remaining basis may be deducted. A real discount rate is used to capture the indexing of allowances.[15]

The President proposes a Capital Cost Recovery System (CCRS) with six asset classes, higher exponential allowances, a switch to straight line at the

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[15]For comparability with old law, the formula for z under RCRS assumes that the asset is purchased at mid-year. It uses continuous discounting at the allowed exponential rate until the close-out year, and continuous discounting of the last year's deduction over the course of that year. The Treasury's grouping of the assets listed in table 2 may be seen on p. 161 of *Tax Reform for Fairness, Simplicity, and Economic Growth.*

optimal time, and indexation for inflation. Deductions are not bunched in the close-out year as in RCRS.[16] The final 1986 Act keeps a modified ACRS and does not index depreciation. It moves autos from 3 to 5 years and some other assets from 5 to 7 or 10 years, but it accelerates the method to double declining balance. Some long-lived assets receive 15 or 20 years with 150 percent declining balance. Nonresidential structures get 31.5 year straight-line, and residential structures get 27.5 year straight-line. The model concentrates on a fully taxable firm and thus excludes the complicated alternative minimum tax and passive loss rules. It also excludes changes in cost capitalization rules for multiperiod production.

4. Results

The first subsection below provides detailed results for 36 assets and 18 industries. Inflation is set at 4 percent, and the net rate of return is 5 percent. Then each of the seven components are introduced and investigated separately. Later subsections show the sensitivity of results to assumptions about arbitrage, the net rate of return, the inflation rate, and financing proportions.

4.1. Detailed results for the standard assumptions

The first column of table 2 shows the old marginal effective total tax rates in the corporate sector for each asset. These rates are negative for all 20 types of equipment, because the expected tax on the future income from a marginal investment is more than offset by the combination of investment tax credits, accelerated depreciation allowances, and interest deductions. Assuming that the firm has sufficient tax liability to make use of these benefits, the subsidy at the corporate level is large enough to offset the personal and property taxes as well as corporate taxes on these assets.

Structures have rates between 24 and 44 percent, while inventories and land are taxed at 42 and 45 percent, respectively. The property tax represents the only difference between these last two assets, but note that interest deductions still reduce effective rates well below the combination of statutory taxes.

The second column of table 2 indicates that the Treasury proposal would indeed closely measure and tax economic income. With economic depreciation allowances and repeal of differential investment tax credits, equipment would be taxed at levels close to those of structures, inventories, and land. This near neutrality is slightly misleading, however, since the Treasury's

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[16]Calculations use the formula on p. 211 of KF, with a real discount rate. The grouping of assets may be seen on p. 145 of *The President's Tax Proposals to the Congress for Fairness, Growth and Simplicity.*

Table 2

Marginal effective total tax rates for each asset in the corporate sector.[a]

	Old law	Treasury proposal	President's proposal	1986 Act
1 Furniture and fixtures	−0.151	0.401	0.244	0.347
2 Fabricated metal products	−0.133	0.379	0.227	0.325
3 Engines and turbines	−0.121	0.415	0.250	0.308
4 Tractors	−0.207	0.396	0.244	0.346
5 Agricultural machinery	−0.139	0.386	0.232	0.332
6 Construction machinery	−0.217	0.404	0.250	0.413
7 Mining and oil field machinery	−0.209	0.397	0.245	0.347
8 Metalworking machinery	−0.164	0.416	0.255	0.362
9 Special industry machinery	−0.145	0.393	0.237	0.339
10 General industrial equipment	−0.164	0.416	0.255	0.362
11 Office and computing machinery	−0.342	0.420	0.267	0.496
12 Service industry machinery	−0.209	0.397	0.245	0.406
13 Electrical machinery	−0.159	0.410	0.251	0.357
14 Trucks, buses, and trailers	−0.316	0.408	0.258	0.415
15 Autos	−0.265	0.385	0.257	0.465
16 Aircraft	−0.230	0.413	0.257	0.362
17 Ships and boats	−0.117	0.410	0.245	0.355

18 Railroad equipment	−0.109	0.395	0.203	0.291
19 Instruments	−0.193	0.384	0.236	0.391
20 Other equipment	−0.193	0.445	0.277	0.391
21 Industrial buildings	0.413	0.463	0.368	0.471
22 Commercial buildings	0.371	0.437	0.342	0.440
23 Religious buildings	0.347	0.422	0.328	0.422
24 Educational buildings	0.347	0.422	0.328	0.422
25 Hospital buildings	0.366	0.433	0.339	0.436
26 Other nonfarm buildings	0.444	0.483	0.388	0.494
27 Railroads	0.283	0.413	0.284	0.417
28 Telephone and telegraph	0.319	0.443	0.301	0.453
29 Electric light and power	0.311	0.437	0.297	0.446
30 Gas facilities	0.238	0.437	0.297	0.419
31 Other public utilities	0.256	0.464	0.312	0.448
32 Farm structures	0.367	0.434	0.340	0.395
33 Mining, shafts and wells	0.261	0.505	0.409	0.306
34 Other nonbuilding facilities	0.388	0.447	0.352	0.452
35 Inventories	0.416	0.427	0.389	0.414
36 Land	0.449	0.451	0.420	0.444

[a]For the case of 4 percent inflation, firm arbitrage, and a 5 percent net rate of return.

Table 3

Marginal effective total tax rates by industry, including all taxes in the corporate, noncorporate, and housing sectors.[a]

Industry	Old law	Treasury proposal	President's proposal	1986 Act
1 Agriculture, forestry and fisheries	0.314	0.319	0.309	0.302
2 Mining	0.223	0.393	0.301	0.376
3 Crude petroleum and gas	0.287	0.436	0.355	0.333
4 Construction	0.293	0.379	0.328	0.362
5 Food and tobacco	0.321	0.426	0.351	0.414
6 Textile, apparel and leather	0.309	0.418	0.344	0.400
7 Paper and printing	0.256	0.418	0.327	0.397
8 Petroleum refining	0.346	0.438	0.358	0.431
9 Chemicals and rubber	0.240	0.418	0.325	0.398
10 Lumber, furniture, stone, clay and glass	0.283	0.416	0.335	0.399
11 Metals and machinery	0.317	0.427	0.351	0.411
12 Transportation equipment	0.359	0.429	0.365	0.417
13 Motor vehicles	0.260	0.427	0.338	0.413
14 Transportation, communication and utilities	0.179	0.410	0.284	0.388
15 Trade	0.340	0.385	0.342	0.367
16 Finance and insurance	0.302	0.335	0.301	0.319
17 Real estate	0.219	0.261	0.258	0.231
18 Services	0.191	0.353	0.278	0.334

[a]For the case of 4 percent inflation, firm arbitrage, and a 5 percent net rate of return.

depreciation allowances are based on the Hulten–Wykoff estimates of economic depreciation used in this study.[17]

The next column shows the President's proposal, where allowances are reaccelerated, particularly for equipment. The repeal of investment tax credits insures positive rates on all assets, however. The 1986 Act is shown in the last column, where rates mostly lie between the two proposals.

Using these rates for the 36 assets and weighting by the stock of each asset employed in each industry, table 3 provides an estimate of the marginal effective total tax rate in each of 18 industries. The low rate in services reflects the high weight on equipment and on the noncorporate sector, while the low rate in real estate reflects the average of owner-occupied housing and noncorporate rental housing.

4.2. Components of the Treasury proposal

As a basis of comparison, results for the old law are summarized in the first column of table 4, where the assets are aggregated separately for the 20 kinds of equipment, the 5 public utility structures, the 9 other structures, plus inventories and land. The overall 29.4 percent rate in the corporate sector is not much different from the 30.6 percent rate in the noncorporate sector,

[17]Unreported calculations reveal that a proportional change in all δ has some effect on the level of effective tax rates, but not on comparisons among assets or between tax regimes. Only a change in the δ of selected assets would affect comparisons.

because the high statutory corporate rate works two ways: it is used to tax the income from equity financed investments, but to deduct nominal interest on debt financed investment.

The 17 percent rate on owner-occupied housing reflects only the state and local property tax, reduced to the degree that it is deducted at the federal level. Also, homeowners deduct interest at a 30 percent rate, while the average interest recipient is taxed at a marginal rate of 23 percent. All sectors are averaged together to get the 26.8 percent overall rate.

The effect of interest indexing by itself can be seen in the second column, where subsidies to equipment are removed and corporate taxes generally are increased. Noncorporate rates change little, because the 24.5 percent rate for proprietors' interest deductions is very close to the 23 percent rate on interest receipts. Only the owner-occupant is still allowed to deduct nominal interest payments, so the total rate in this sector falls from 17 to 15 percent.

One interesting effect of this reform is demonstrated by the value of i shown in the bottom row of table 4. Under the 1985 law, with 4 percent inflation, the nominal interest rate must be 13.24 percent in order for investors to pay tax on nominal interest and still receive their fixed 5 percent real net return. When investors are taxed on a fraction f of nominal interest, a fraction designed to approximate the real component, the nominal rate only needs to be 11.53 percent to provide the same real net return.[18]

The third column of table 4 shows the results of the conceptual experiment of 'pure' interest indexing. Effective tax rates are very close to those of Treasury's approximation, but the real interest rate in this model is not far from the 6 percent rate assumed by Treasury. Further experiments reveal that the approximation works less well under other conditions.

The biggest single step that could be taken toward leveling diverse effective tax rates would be the repeal of the investment tax credit that applies only to equipment and public utility structures. The fourth column of table 4 shows this component by itself, where rates for equipment rise from -0.180 to $+0.361$, and the overall corporate sector rate rises from 0.294 to 0.397. The results of this study could be used to construct for each tax regime a general equilibrium measure of the welfare cost from misallocation of capital, along the lines of Harberger (1966). Absent such a measure, the penultimate row of the table shows a rough indicator of such effects, the weighted standard deviation of pretax returns (ρ) across all assets in all three sectors.[19] The

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[18]These calculations use the assumption of firm arbitrage, but the same point is more obvious with the alternative of individual arbitrage. In that case $s = i(1 - \tau_d f) - \pi$, so i must be $(s + \pi)/(1 - \tau_d f)$. With no change to s or π, the reform would simply decrease f and thus decrease the nominal interest rate. This point bears no relation to the effect of inflation on nominal interest, an effect discussed below.

[19]The weighted standard deviation indicates potential only for intratemporal distortions. Since the overall tax on capital is increased by ITC repeal, intertemporal distortions may offset intratemporal welfare gains.

Table 4

Summary statistics for each component of the 1984 Treasury plan.[a]

	Old law	Treasury indexing[b]	'Pure' indexing[c]	Repeal ITC[d]	Capital gains[e]	Dividend deduction[f]	Corporate rate reduction[g]	Personal rate reduction[h]
Corporate sector tax rates								
Equipment	-0.180	0.095	0.058	0.361	-0.195	-0.208	-0.059	-0.251
Structures	0.374	0.448	0.433	0.374	0.368	0.362	0.367	0.358
Public utilities	0.294	0.376	0.359	0.405	0.286	0.279	0.299	0.275
Inventories	0.416	0.512	0.496	0.416	0.409	0.404	0.407	0.393
Land	0.449	0.531	0.517	0.449	0.442	0.437	0.436	0.429
Overall corporate	0.294	0.409	0.390	0.397	0.286	0.279	0.301	0.267
Noncorporate sector tax rates								
Equipment	-0.098	-0.097	-0.098	0.248	-0.099	-0.099	-0.109	-0.121
Structures	0.276	0.282	0.281	0.276	0.276	0.276	0.282	0.260
Public utilities	0.208	0.215	0.215	0.308	0.209	0.209	0.216	0.193
Residential structures	0.325	0.332	0.331	0.325	0.325	0.326	0.334	0.313
Inventories	0.304	0.309	0.309	0.304	0.305	0.305	0.309	0.282
Land	0.332	0.337	0.337	0.332	0.332	0.332	0.338	0.311
Residential land	0.381	0.387	0.386	0.381	0.381	0.381	0.388	0.362
Overall noncorporate	0.306	0.311	0.311	0.319	0.306	0.306	0.312	0.287
Owner-occupied housing tax rate	0.170	0.149	0.153	0.170	0.171	0.171	0.182	0.176
Overall tax rate	0.268	0.317	0.308	0.307	0.266	0.265	0.278	0.252
Standard deviation	0.0188	0.0169	0.0164	0.0138	0.0188	0.0188	0.0142	0.0192
Interest rate	0.1324	0.1153	0.1173	0.1324	0.1322	0.1320	0.1272	0.1284

[a]Marginal effective total tax rates for the case of 4 percent inflation, firm arbitrage, and a 5 percent net rate of return.
[b]The only change from 1985 law is the Treasury's version of interest indexing.
[c]The only change from 1985 law is the 'pure' version of interest indexing.
[d]The only change from 1985 law is the repeal of investment tax credits.
[e]The only change from 1985 law is the full taxation of real capital gains.
[f]The only change from 1985 law is the deduction for 50 percent of corporate dividends paid.
[g]The only change from 1985 law is the reduction of u from 0.495 to 0.374.
[h]The only change from 1985 law is the reduction of personal rates shown in table 1.

repeal of investment tax credits would reduce this measure by more than any other component, from 0.0188 to 0.0138. Remaining variation stems from accelerated depreciation allowances and the nontaxation of owner-occupants' imputed net rents.

The next component would fully tax all realized capital gains but index the basis for inflation. This model does not allow for effects on retentions, realizations, tax certainty, or horizontal equity. It does capture the reduced dependence of taxes on inflation, as shown below. Corporate sector effective tax rates in the fifth column are slightly lower than those of the old law, indicating the important result that indexing is slightly more valuable to taxpayers than the loss of their 60 percent exclusion, even at only 4 percent inflation. As seen for the President's proposal below, investors choose indexing over the exclusion when the inflation rate reaches 4 percent.

The 50 percent dividend deduction in the sixth column shows very little reduction of tax rates (and only in the corporate sector). The 10 percent dividend deduction would change rates even less. The effect of this deduction is limited to the total tax on new share issues, however, a small 5 percent fraction of total corporate financing. The dividend deduction might provide a substantial benefit to existing retentions within the firm, but it does not apply to a marginal investment financed by retained earnings: the rate of return to shareholders in this case involves taking the later dividends relative to the currently forgone dividends, and the deduction would apply equally to both.[20]

The reduction of the corporate rate from 46 to 33 percent also has little effect on tax rates, as shown in the seventh column. The reduced tax on equity is offset by the reduced advantage of nominal interest deductions.[21]

Finally,[22] the reduction of personal tax rates would reduce marginal effective total tax rates by a couple of percentage points in both the corporate and noncorporate sectors. The nearly unchanged rate for owner-occupants in the eighth column of table 4 does not include their loss of property tax deductibility.

The effect of each component depends on whether it is introduced by itself, as shown here, or in combination with other components. At least for this model with the standard set of parameters, the tax-increasing effects are

[20]This argument is consistent with the 'new view' of Auerbach (1979), Bradford (1981), and King (1977), but there is no case in which dividend taxes apply to marginal investment financed by retentions. To reflect the 'old view' that dividend taxes affect marginal investment, subsection 4.4 simulates the effects of greater finance through new shares.

[21] Under the assumption of firm arbitrage, the high corporate rate drives s^c below s^{nc}. Similar effective tax rates mean that the various ρ^c are below the corresponding ρ^{nc}. The fall in the corporate rate also reduces this discrepancy and thus substantially reduces the standard deviation of the ρ's shown near the bottom row of the table.

[22]Table 4 does not show RCRS or CCRS by themselves, because the ρ for some assets are negative. In this case the tax wedge $(\rho - s)$ is correctly negative, but the division by ρ changes the sign of the effective tax rate and makes it difficult to interpret. The RCRS and CCRS rules may work well with other components of the two tax plans, but they enlarge the subsidy for some equipment when combined with investment tax credits and nominal interest deductions.

relatively large for interest indexing and repeal of investment tax credits. Tax-reducing effects are small for capital gains changes and the dividend deduction, and nonexistent for the corporate rate reduction. The next subsection shows the impact of these reforms for other assumptions.

4.3. Alternative models and assumptions

Results for the standard assumptions are reproduced in the first four columns of table 5. With firm arbitrage and a 5 percent net return, the Treasury plan would put all corporate assets into the 40 percent tax rate range and increase the economy's rate from 26.8 to 34.5 percent. The owner-occupied housing rate increases from 17 to 22 percent with the loss of property tax deductibility; the weighted standard deviation of pretax returns falls from 0.0188 to 0.0105.

Corporate sector rates are raised by the President's proposal with these assumptions, but they are still lower than for the Treasury plan. Interasset differences are greater than under the Treasury plan, but differences between the sectors are less. The latter effect seems to dominate, as the weighted standard deviation falls to 0.0098. The 1986 Act raises the corporate sector's rate but restores homeowners' property tax deductions. The overall rate is 31 percent.

Results for individual arbitrage are shown in the next four columns. With this assumption under the old law, effective tax rate estimates are higher for all assets in such a way that disparities remain but equipment is no longer subsidized. However, the more uniform treatment of different investors under the proposals and the 1986 Act means that estimates of effective tax rates are much less sensitive to this change of assumption. Still the Treasury plan and the 1986 Act are found to increase marginal effective total tax rates.

With this assumption, however, the President's proposal would reduce the old rate in the corporate sector from 37 to 36 percent. This plan might therefore increase or decrease effective rates, depending on assumptions.

The assumption of a 5 percent net return is tested in the last four columns, for the case of firm arbitrage. With a 3 percent net return instead, 1985 rates vary from −58 percent for equipment to +47 percent for land. The proposals and the 1986 Act would still tend to equalize effective tax rates, but a higher levels.

One of the striking features of the 1985 law is the sensitivity of taxes to inflation. This sensitivity is demonstrated for some assets in fig. 1, where taxes on corporate land and inventories fall with inflation beacause of LIFO accounting and nominal interest deductions (at a corporate rate greater than the personal rate on interest receipts).[23] Taxes on depreciable assets increase

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[23]The 5 percent real net rate of return is held fixed, so the nominal interest rate must increase by more than the rate of inflation. See Darby (1975). An alternative assumption might use empirical estimates of the effect of inflation on actual interest rates, but then s and π would change simultaneously and calculations would not isolate the effects of alternative π. For effective tax rates with alternative versions of Fisher's Law, see Bradford and Fullerton (1981).

Table 5

Summary statistics for different assumptions.[a]

	Firm arbitrage (s=0.05)				Individual arbitrage (s=0.05)				Firm arbitrage (s=0.03)			
	Old law	Treasury proposal	President's proposal	1986 Act	Old law	Treasury proposal	President's proposal	1986 Act	Old law	Treasury proposal	President's proposal	1986 Act
Corporate sector tax rates												
Equipment	-0.180	0.405	0.246	0.370	0.046	0.412	0.270	0.373	-0.575	0.425	0.274	0.465
Structures	0.374	0.463	0.368	0.435	0.405	0.467	0.388	0.436	0.463	0.497	0.397	0.520
Public utilities	0.294	0.438	0.298	0.440	0.327	0.442	0.304	0.438	0.399	0.482	0.380	0.535
Inventories	0.416	0.427	0.389	0.414	0.478	0.433	0.408	0.434	0.404	0.450	0.406	0.451
Land	0.449	0.451	0.420	0.444	0.496	0.455	0.432	0.456	0.465	0.487	0.456	0.497
Overall corporate rate	0.294	0.430	0.343	0.411	0.368	0.436	0.361	0.421	0.293	0.459	0.374	0.481
Noncorporate sector tax rates												
Equipment	-0.098	0.273	0.202	0.236	-0.131	0.281	0.211	0.252	-0.193	0.311	0.245	0.293
Structures	0.276	0.319	0.283	0.288	0.295	0.330	0.293	0.305	0.328	0.369	0.328	0.346
Public utilities	0.208	0.329	0.258	0.313	0.233	0.343	0.276	0.333	0.274	0.391	0.332	0.383
Residential structures	0.325	0.354	0.327	0.340	0.351	0.369	0.343	0.361	0.393	0.422	0.394	0.412
Inventories	0.304	0.290	0.286	0.277	0.317	0.299	0.296	0.288	0.337	0.330	0.325	0.314
Land	0.332	0.321	0.317	0.307	0.349	0.332	0.329	0.322	0.376	0.373	0.368	0.358
Residential land	0.381	0.374	0.371	0.361	0.404	0.390	0.388	0.382	0.441	0.444	0.440	0.429
Overall noncorporate rate	0.306	0.322	0.307	0.306	0.323	0.334	0.320	0.322	0.352	0.376	0.360	0.361
Owner-occupied housing tax rate	0.170	0.218	0.229	0.186	0.191	0.210	0.241	0.201	0.260	0.345	0.338	0.280
Overall tax rate	0.268	0.345	0.300	0.313	0.313	0.352	0.318	0.338	0.314	0.401	0.358	0.379
Standard deviation	0.0188	0.0105	0.0098	0.0093	0.0144	0.0104	0.0071	0.0103	0.0160	0.0063	0.0082	0.0076
Interest rate	0.1324	0.1106	0.1234	0.1235	0.1170	0.1026	0.1132	0.1118	0.1030	0.0857	0.0957	0.0961

[a]Marginal effective total tax rates in each sector, for the case of 4 percent inflation.

with inflation because of historical cost depreciation, despite the same nominal interest deductions. Accelerated allowances for equipment may have been intended to offset high inflation of the past decade, but the impact of low inflation is dramatically demonstrated.

The most innovative features of the Treasury plan were designed specifically to deal with the scattered effects of inflation shown in fig. 1. When indexation of interest, depreciation and capital gains are combined with the other features of the Treasury proposal, fig. 2 shows that inflation has virtually no remaining effect. It reduces taxes on owner-occupied housing because of nominal mortgage interest deductions, but property taxes represent the major remaining difference among corporate assets.
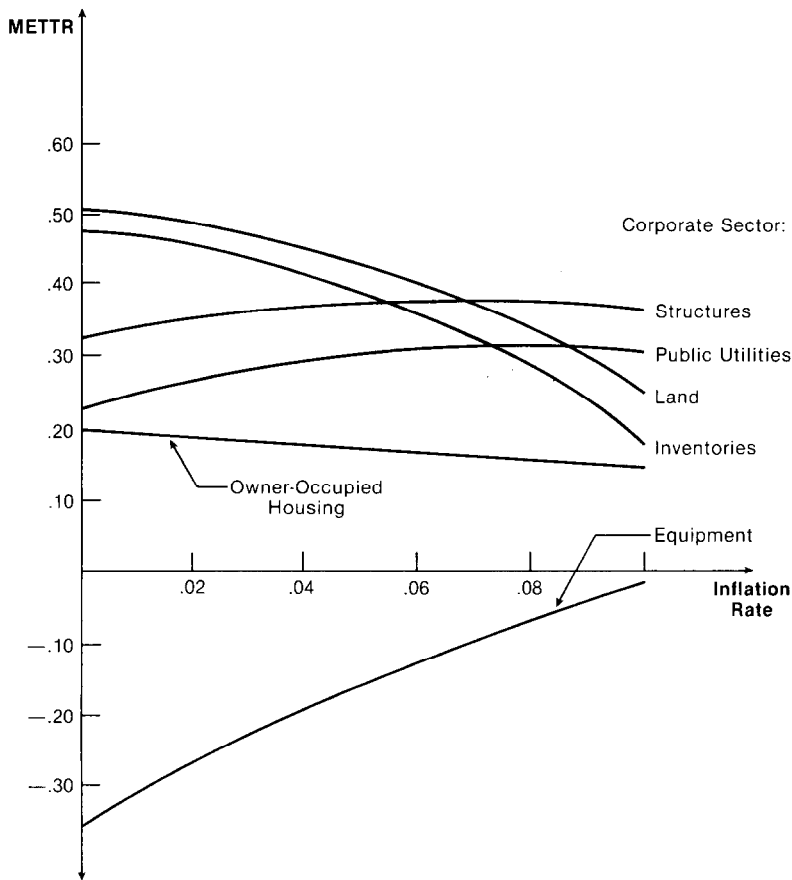
Fig. 1. Marginal effective total tax rates (METTR) and inflation under the old law.
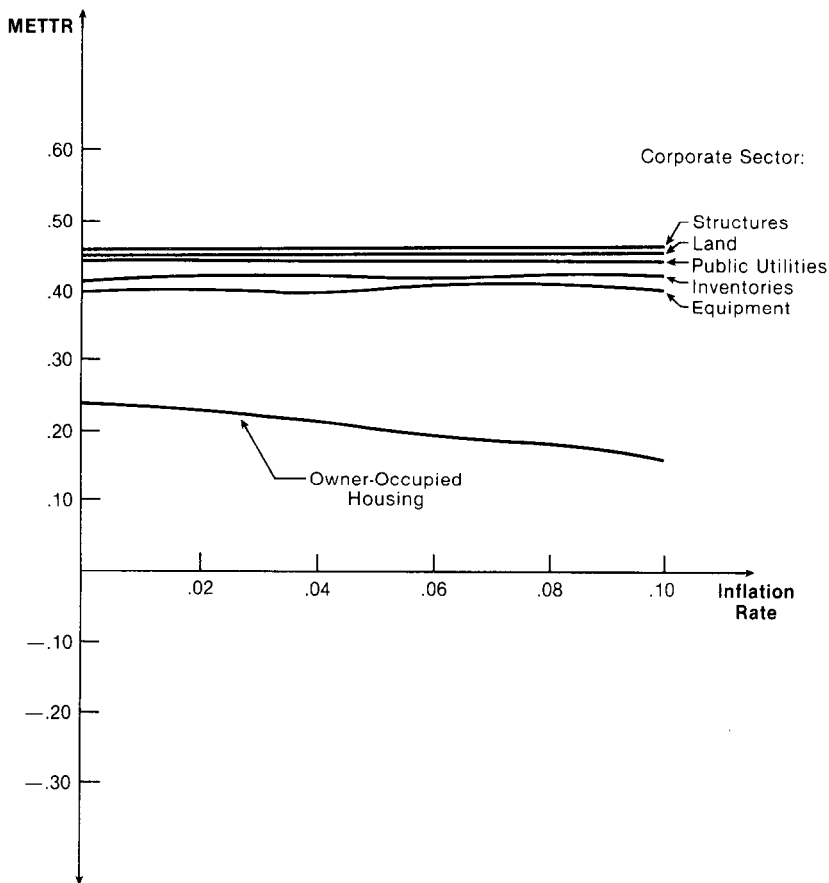
Fig. 2. Marginal effective total tax rates (METTR) and inflation under the Treasury plan.

The President's proposal would drop interest indexing, but fig. 3 shows that this feature is less important when the corporate rate is reduced to a level more similar to the rate at which nominal interest receipts are taxed. Effective rates fall only slightly with inflation. Fig. 3 also shows how CCRS retains some corporate asset differences. Finally, the 1986 Act drops depreciation indexing as well. The pattern in fig. 4 is therefore similar to the old law, but it is much less pronounced because the fixed depreciation allowances and nominal interest deductions are taken at much lower rates. The overall rate for the new law is almost perfectly flat across different inflation rates.

4.4. Other special cases

As described in section 2, tax-minimizing behavior by firms implies the use of LIFO inventory accounting. Yet firms appear to make voluntary tax payments by using other methods for as much as 70 percent of inventories
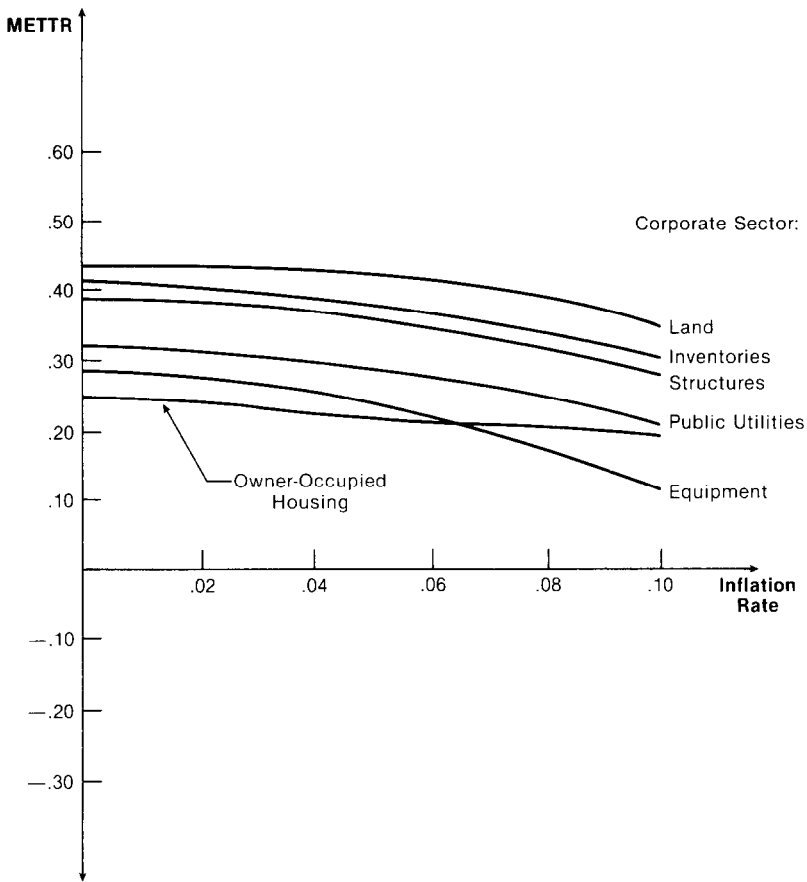
Fig. 3. Marginal effective total tax rates (METTR) and inflation under the President's proposal.

(KF, p. 205). They may wish to report higher profits to shareholders, and the law requires conformity between tax and book accounts. If calculations are modified to include these voluntary payments as part of the tax wedge (KF, p. 21), then the 1985 effective tax rate on corporate inventories at 4 percent inflation rises from 41.6 percent to 59.8 percent. In fig. 1, the effective rate for inventories would be rising rather than falling with inflation. In contrast to standard results, the economy rate also would rise slightly with inflation.

Table 6 summarizes sectoral effective tax rates, for the standard parameters in panel A and for 70 percent FIFO in panel B. Under the old law, the overall rate would be 30.8 percent instead of 26.8 percent, four points higher.
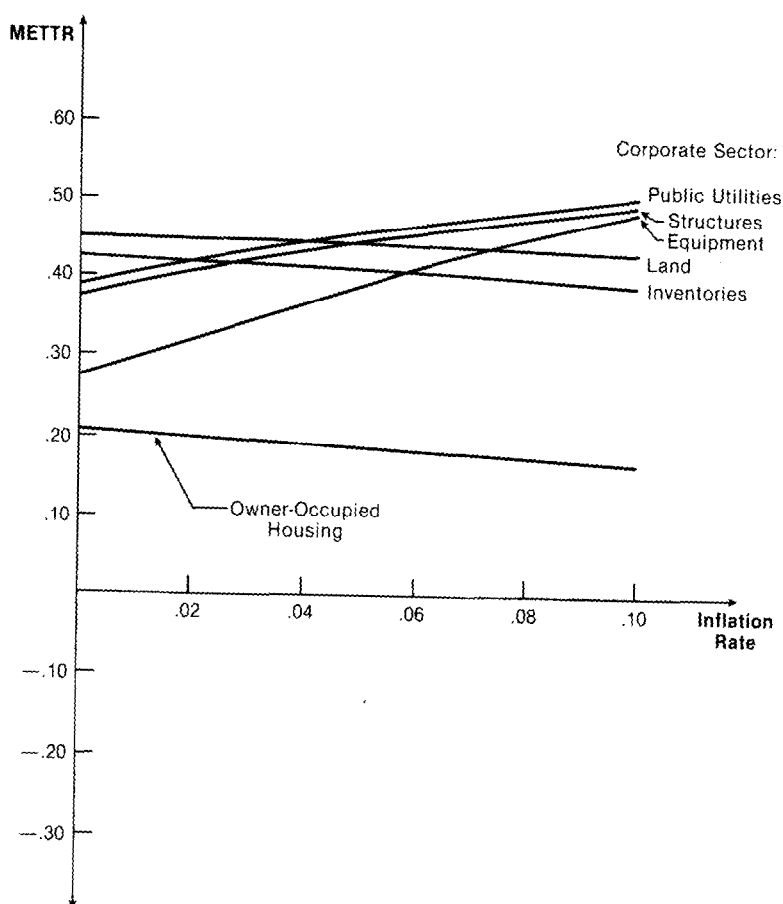
Fig. 4. Marginal effective total tax rates (METTR) and inflation under the Tax Reform Act of 1986.

Under the proposals, however, firms could use a new indexed FIFO method, and would not have to conform tax and book accounts. The proper comparison is therefore unclear. Panel B shows tax changes only, so inventory accounting is held fixed and any reform would still raise effective tax rates. A mixture of tax changes and behavioral changes, however, would allow the overall effective tax rate to fall from 30.8 percent under the old law (with 70 percent FIFO, panel B) to 30.0 percent under the President's proposal (with LIFO or indexed FIFO, panel A). The 1986 Act does not introduce indexed FIFO or modify the conformity requirement.

The case with no property tax is shown in panel C of table 6. These calculations indicate that property taxes constitute most of the total tax rate under 1985 law and the President's proposal, but less under the Treasury

Table 6

Summary statistics for special cases.

		Old law	Treasury proposal	President's proposal	1986 Act
A.	Standard parameters[a]				
	Corporate sector tax rate	0.294	0.430	0.343	0.411
	Noncorporate sector tax rate	0.306	0.322	0.307	0.306
	Owner-occupied housing tax rate	0.170	0.218	0.229	0.186
	Overall tax rate	0.268	0.345	0.300	0.313
B.	FIFO for 70 percent of inventories				
	Corporate sector tax rate	0.405	0.468	0.398	0.460
	Noncorporate sector tax rate	0.314	0.330	0.315	0.313
	Owner-occupied housing tax rate	0.170	0.218	0.229	0.186
	Overall tax rate	0.308	0.365	0.323	0.337
C.	No property tax				
	Corporate sector tax rate	0.131	0.355	0.226	0.313
	Noncorporate sector tax rate	0.194	0.208	0.188	0.189
	Owner-occupied housing tax rate	−0.058	−0.134	−0.054	−0.053
	Overall tax rate	0.117	0.213	0.148	0.180
D.	No corporate income tax				
	Corporate sector tax rate	0.284	0.259	0.278	0.302
	Noncorporate sector tax rate	0.331	0.332	0.326	0.326
	Owner-occupied housing tax rate	0.220	0.242	0.270	0.222
	Overall tax rate	0.289	0.285	0.294	0.295
E.	All debt				
	Corporate sector tax rate	−0.321	0.300	0.060	0.098
	Noncorporate sector tax rate	0.310	0.328	0.308	0.311
	Owner-occupied housing tax rate	0.114	0.062	0.181	0.134
	Overall tax rate	0.098	0.264	0.197	0.198
F.	All equity				
	Corporate sector tax rate	0.542	0.493	0.474	0.554
	Noncorporate sector tax rate	0.304	0.320	0.307	0.303
	Owner-occupied housing tax rate	0.197	0.294	0.252	0.210
	Overall tax rate	0.345	0.384	0.349	0.367
G.	Equity fraction is all new shares				
	Corporate sector tax rate	0.482	0.437	0.459	0.506
	Noncorporate sector tax rate	0.300	0.322	0.302	0.301
	Owner-occupied housing tax rate	0.159	0.217	0.218	0.177
	Overall tax rate	0.316	0.347	0.333	0.342

[a]Marginal effective total tax rates in each sector, for 4 percent inflation, firm arbitrage, and a 5 percent net rate of return.

plan and 1986 Act. If individuals are mobile and fully informed, then Tiebout (1956) suggests that the property tax is not a distorting tax at all but a voluntary payment for local public services. Fischel (1975) and White (1975) suggests that the same hypothesis could apply to firms. Without property taxes, housing is subsidized because the homeowners' rate for interest deductions exceeds the personal rate on interest receipts. If the property tax

is not distorting, then the total tax on combined income from capital in the United States was only 12 percent of the pretax return.

The case with no corporate tax is shown in panel D of table 6. The rate in the corporate sector is only slightly reduced from the standard case, indicating that the 1985 corporate tax is completely offset by credits, allowances, and nominal interest deductions.[24] It may distort allocation without collecting any revenue from the marginal investment. Under the proposals and the Act, the corporate tax does collect revenue at the margin.

These calculations can be taken to represent corporate tax repeal, but they also indicate something about taxes on any firm in an indefinite loss position. Virtually no data is available on how much investment is undertaken by such firms, or on when they expect to pay taxes. Indeed, the uncertainty itself can affect marginal investment. These calculations show only the extreme case where credits are never used and income from the investment is never taxed. They indicate that, under the old law, the firm is not any better off or worse off when it loses its credits and deductions as well as the tax on its income.

Next, Stiglitz (1973) has suggested that investments can be totally debt financed at the margin. This case is presented in panel E of table 6, where the entire corporate sector in 1985 is subsidized at a 32.1 percent rate (despite positive personal and property taxes). Debt has the least impact under the Treasury plan, where interest deductions and receipts are indexed.

At the other extreme, panel F shows that a marginal corporate investment financed entirely by equity would pay 54 percent under the old law, 49 percent under the Treasury plan, 47 percent under the President's proposal, and 55 percent under the Act. The proposals reduce the tax on equity because the corporate rate reduction and dividend deduction more than compensate for the loss of investment tax credits. The Treasury plan would most reduce the disparity between debt and equity.[25]

Finally, the logic of section 2 (and footnote 20) requires that dividend taxes apply only to new shares, a mere 5 percent of total finance in the standard calculations. These parameters correctly represent a proportional growth in the economy, but a given firm may use retained earnings before turning to new shares. Once exhausted, retained earnings cannot finance any fraction of new investment. Panel G therefore shows the special case where equity is all new shares (but debt is still one-third). Effective tax rates rise considerably. The dividend deduction also applies to a greater fraction,

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[24]If the old corporate tax includes FIFO inventory accounting, then its elimination reduces effective rates from 40.5 percent (panel B) to 28.4 percent (panel D).

[25]Corporations might shift toward greater use of equity finance, but they would not reduce their taxes in doing so. Under the Treasury plan with 10 percent less debt and 10 percent greater new share issues, the total rate on new investment in the corporate sector increases from 43 percent to 45 percent.

however, so both the Treasury and the President's proposals would reduce effective tax rates in the corporate sector.

5. Conclusion

The Treasury Department's November 1984 tax plan proposes to adopt carefully coordinated features of a more comprehensive income tax, including the indexation of interest, depreciation, and capital gains. President Reagan's plan is similar, but it would re-accelerate depreciation allowances and drop the indexation of interest. The ultimate outcome of this process was the Tax Reform Act of 1986. It undertakes no new indexing, but it retains substantial reduction of rates and the repeal of investment tax credits.

This paper looks at the incentives under alternative tax regimes to make marginal investments in the corporate sector, noncorporate sector, and in owner-occupied housing. Under standard assumptions, the old system is characterized by effective tax rates that increase with inflation for some assets and decrease with inflation for others. Overall rates fall with inflation, and the corporate tax is completely offset by credits, allowances, and deductions. Under the Treasury plan, the corporate tax re-emerges, effective tax rates are considerably more uniform, and the interference of inflation is virtually eliminated.

Under the President's proposal, effective tax rates in the corporate sector might rise or fall from the old law, depending on assumptions. This plan reduces intersectoral differences and is only moderately affected by inflation. Finally, under the 1986 Act, inflation still raises some effective tax rates and reduces others. This effect is much less pronounced than under the old law, however, because nominal depreciation deductions and nominal interest deductions are valued at much lower rates. The overall rate is unaffected by inflation.

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