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THE INDEXATION OF INTEREST, DEPRECIATION, AND CAPITAL GAINS: A MODEL OF INVESTMENT INCENTIVES

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ABSTRACT

Despite much recent interest in a consumption tax, 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. The May 1985 White House proposal would retain some of these indexing provisions. 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. It finds that the current system is characterized by effective tax rates that increase with inflation for some assets and decrease with inflation for other assets. Overall rates fall with inflation, and the corporate tax is completely offset by credits, allowances, and deductions. Under the Treasury or White House plans, the corporate tax re-emerges, effective tax rates are considerably more uniform, and the interference of inflation is virtually eliminated.

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1. Introduction

Public finance economists in recent years have exhibited progressively less interest in the equity and efficiency properties of a comprehensive income tax, and correspondingly more interest in those of a comprehensive consumption tax.[1] The discussion has centered around administrative feasibility, the efficient allocation of resources, and the insulation of taxes to the interference of inflation. In particular, a tax on the Haig-Simons definition of income is said to require the administratively difficult indexation of interest, depreciation, and capital gains.

Despite this trend, the U.S. Treasury Department in November 1984 announced their proposal to adopt carefully coordinated features of 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, but it includes other interesting features such as the partial integration of corporate and personal taxes through a 50 percent deduction for corporate dividends paid. Perhaps the most innovative and difficult features of the plan, however, are the attempts to measure a real tax base through multiple indexing provisions.

These provisions make the original Treasury proposal interesting as a subject of economic investigation, despite the greater political viability of the more recent President's Tax Proposals to the Congress for Fairness, Growth, and Simplicity. This paper investigates, for

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[1] See, for examples, Summers (1981), Auerbach, Kotlikoff, Skinner (1983), and Fullerton, Shoven, Whalley (1983).

alternative special cases and assumptions, the investment incentives afforded by the current 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. It incorporates all of the tax consequences to the firm that makes the investment and to the saver who provides the finance. The difference between the pretax return and the posttax return for each project is a marginal effective tax rate along the lines of Auerbach and Jorgenson (1980), Gravelle (1982), or Hulten and Robertson (1984). In particular, like King and Fullerton (1984), this paper includes all interactions among corporate taxes, personal taxes, and state and local property taxes. Like Fullerton and Henderson (1984), it goes beyond the corporate sector to include taxation of capital in the noncorporate sector and in owner-occupied housing. This addition is important because the corporate sector contains only one-third of the U.S. capital stock. Another third is in owner-occupied housing while the final third is in the noncorporate business sector, including rental housing.

The model, described in Section 2, is based on assumptions of perfect competition, factor mobility, and perfect certainty. It assumes that the firm invests in each asset until the net return just equals the net cost of funds, using two separate ways to determine that cost. It shows the effective total tax on the income from investment in any of 36 different assets in 18 different industries. To weight these marginal rates together for a given tax regime, it takes an equiproportional

increase in all assets and in all personal savings. The model in this paper can accommodate any indexed or unindexed provisions for depreciation, interest, or capital gains. It is also generalized to allow alternative dividend provisions.

While the proposals involve sweeping changes to fringe benefits, charitable contributions, and other deductions, this paper concentrates on the provisions that would affect taxes on income from capital. Section 3 outlines the seven major provisions investigated here, including: 1) the reduction of the corporate rate from 46 to 33 percent, 2) the reduction of personal rates 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.

For current law, the results in Section 4 may be summarized under three main points. First, the marginal effective total tax rate is about 30 percent, lower than previous estimates for the corporate sector alone, and much lower than the 70 percent average effective total tax rate found by Feldstein, Dicks-Mireaux, and Poterba (1983).[2] Second, the corporate tax is found to add nothing to the overall rate on marginal investment, because the expected tax is completely offset by credits, allowances, and interest deductions. It does not collect revenue from these marginal investments but still distorts their allocation. Third, as inflaton increases, some effective rates rise

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[2]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.

because of historical cost depreciation and others fall because the corporate rate for nominal interest deductions exceeds the personal rate for nominal interest receipts. Overall, taxes fall with inflation, in contrast to results of Feldstein and Summers (1979).

Three points also may be made about the Treasury proposal. First, under almost any set of assumptions, the corporate tax would re-emerge and thus raise effective tax rates. Second, however, the plan would significantly level the tax treatment of different assets. It would eliminate subsidies to equipment and debt financed investment, and it would reduce the currently high rates on nondepreciable assets and equity financed investments. Third, the Treasury plan would virtually eliminate the dependence of effective tax rates on inflation.

Finally, the White House plan would retain some of the current advantages for equipment. Effective rates in the corporate sector are not as high as under the Treasury plan, so intersectoral distortions might be less. The White House plan also eliminates most of the current dependence on inflation.

2. A Model of Investment Incentives

To derive a user cost of capital formula like that of Hall and Jorgenson (1967), 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.[3] The aquisition cost is q, but an investment tax credit at rate k reduces the net cost of the asset to $q(1-k)$. The rental return on this asset starts at level c, increases at the constant inflation rate π, and decreases because of constant exponential depreciation of the asset at rate δ. Local property tax at rate w is paid on the asset's value at any point in time, and the return net of property tax is subject to the corporate income tax at statutory rate u. These net returns are discounted at the firm's nominal after-tax discount rate r. The present value of depreciation allowances per dollar of investment is z, so the present value of tax savings is uzq.[4] In equilibrium, then, the net outlay must be exactly matched by the present value of net returns:

$$q(1-k) = \int_0^\infty (1-u)(c-wq)e^{(\pi-\delta)t}e^{-rt}dt + uzq \quad . \qquad (1)$$

This expression can be integrated and solved for the rental rate c/q. Subtraction of δ provides ρ^c, the real social rate of return in the corporate sector, gross of tax but net of depreciation:

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[3]Effective rates for an untaxed corporation are shown in section 4.4, but virtually no data is available on how much investment is undertaken by such firms or on how long they expect to remain in their loss position. The effects of uncertainty and imperfect loss offsets are also investigated in, for example, Auerbach (1983).

[4]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 calculations here assume LIFO methods.

$$\rho^c = \frac{r-\pi+\delta}{1-u}(1-k-uz) + w - \delta \quad . \qquad (2)$$

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 (2) gives an analogous expression for ρ^{nc}, the social rate of return in the noncorporate sector. Finally, owner-occupied housing receives no credit or depreciation allowances. A fraction λ of property taxes are deducted at the homeowner's personal marginal tax rate τ_h, and the imputed return is not taxed. Use of the homeowner's discount rate and an equilibrium condition similar to (1) provides ρ^h, the social rate of return to owner-occupied housing:

$$\rho^h = r - \pi + (1-\lambda\tau_h)w \quad . \qquad (3)$$

The next sections describe two alternative ways to derive the discount rates for the three sectors, assuming that financial decisions are separate from real investment decisions. Prior definitions will be useful for both of those alternatives. First, 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).[5] A

[5]This fraction is 1.0 under current law in the U.S., but would be set in a particular way by the November 1984 Treasury proposal.

fraction c_d of corporate investment is financed by debt, and f of the nominal interest payments are taxed at the debtholders' personal marginal rate τ_d. The net return is $i(1-\tau_d f)$.

A fraction c_{re} of corporate investment is financed by retained earnings, and the resulting share appreciation 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 remaining fraction c_{ns} of corporate investment is financed by new shares, and each dollar of after-corporate-tax return could instead be distributed as θ dollars of dividends.[6] This dividend is subject to personal taxes at rate τ_{ns}.

In the noncorporate sector, n_d of new investment is financed by debt, and n_e is financed by equity. A fraction h_d of housing is debt, while h_e is equity. All nominal mortgage interest is deducted at the homeowner's personal marginal tax rate τ_h. Finally, define (K^c, K^{nc}, K^h) as the shares of the capital stock, and (s^c, s^{nc}, s^h) as the net of all tax returns, in the corporate, noncorporate, and owner occupied housing sectors, respectively. The overall net return is:

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

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[6] 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 current law, but greater than one where a dividend deduction allows firms to pay more in dividends than they could retain after tax.

2.1. Firm Arbitrage

For the standard set of calculations, assume that the firm can arbitrage between debt and real capital, as in Bradford and Fullerton (1981). In this case the corporation can save $i-ufi$ by retiring a unit of debt. Even equity financed marginal investments must then earn $i(1-uf)$ in equilibrium, because the corporation could always have used the funds to retire a unit of debt. All nominal net returns are then discounted at the rate $r = i(1-uf)$, whatever the source of finance.

Before proceeding to the discount rates of the other sectors, the return net of all taxes in the corporate sector can be calculated. For c_d of corporate investment, the corporation pays out nominal interest i, and the net return to debtholders is $i(1-\tau_d f)$. For the fraction c_{re}, the return after corporate taxes $i(1-uf)$ results in capital gains to the shareholder that are taxed at the rate τ_{re}. The net return is $i(1-uf)(1-\tau_{re}) + \tau_{re}\pi\gamma$. And for c_{ns} of investment, when the net return $i(1-uf)$ is paid out, stockholders receive $i(1-uf)\theta$ in dividends. The net return on this fraction of investment is thus $i(1-uf)\theta(1-\tau_{ns})$. In combination, the overall real net return is:

$$s^c = c_d[i(1-\tau_d f)] + c_{re}[i(1-uf)(1-\tau_{re})+\tau_{re}\pi\gamma] + c_{ns}[i(1-uf)\theta(1-\tau_{ns})] - \pi \quad . \tag{5}$$

The total effective marginal tax rate in the corporate sector, including all corporate, personal and property taxes, is simply $(\rho^c-s^c)/\rho^c$, the tax wedge as a fraction of the pretax return.

The noncorporate firm can always deduct a fraction f of nominal interest at the rate τ_{nc}, so its discount rate is $i(1-\tau_{nc}f)$. This is also the net return to equity financed investment. The overall net noncorporate return is then:

$$s^{nc} = n_d[i(1-\tau_d f)] + n_e[i(1-\tau_{nc} f)] - \pi \qquad (6)$$

and the marginal effective total tax rate is $(\rho^{nc}-s^{nc})/\rho^{nc}$.

Since the Treasury proposal allows the homeowner to deduct all nominal interest payments, at rate τ_h, the discount rate for this housing is $i(1-\tau_h)$. Again, even equity financed marginal investments must earn this net rate of return, since the homeowner could always have used the funds to retire a unit of debt instead. Since lenders earn $i(1-\tau_d f)$, the overall net return in this sector is:

$$s^h = h_d[i(1-\tau_d f)] + h_e[i(1-\tau_h)] - \pi \quad . \qquad (7)$$

The marginal effective total tax rate is $(\rho^h-s^h)/\rho^h$.

An important point to note is that all of the investors (firms) and all of the savers (individuals) are tied together through a single interest rate. The tax rules and relative sizes of different investments will all help determine the relationships among the pretax returns ρ, the interest rate i, and the posttax returns s. In particular, the analysis could proceed by choosing i and π, calculating the ρ from equations (2) and (3), calculating the different s from (5)-(7), and then the overall s from (4).

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, but the leveling of different pretax returns is part of the point of tax reform. For these reasons, calculations start by choosing s and π. Equations (4)-(7) are then solved for the nominal interest rate i, and the specified discount rates are used in equations (2)-(3) 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.

2.2. Individual Arbitrage

The model above insures equal rates of return to all activities of each firm, but it implies different rates of return to the ultimate savers. A holder of debt in any sector earns $i(1-\tau_d f)$, but noncorporate equity earns $i(1-\tau_{nc} f)$. Equity in the corporate sector earns less, because it pays both corporate and personal taxes.

In an alternative model, assume that individuals actually hold all of these assets, and that they arbitrage away any differences in net rates of return. All assets must then provide the net return that individuals could earn on their debtholdings:

$$s = s^c = s^{nc} = s^h = i(1-\tau_d f) - \pi \quad . \tag{8}$$

Again, start with an assumption on s, and calculate i simply as $(s+\pi)/(1-\tau_d f)$. This interest rate provides the corporation's discount rate for debt, given by $i(1-uf)$. Retained earnings, however, must earn a nominal net-of-corporate-tax 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:

$$c_d\left[i(1-uf)\right] + c_{re}\left[\frac{i(1-\tau_d f) - \tau_{re}\pi\gamma}{(1-\tau_{re})}\right] + c_{ns}\left[\frac{i(1-\tau_d f)}{\theta(1-\tau_{ns})}\right] \quad . \tag{9}$$

The noncorporate firm's debt costs $i(1-\tau_{nc} f)$, and its equity must earn $i(1-\tau_d f)$ after taxes, because of individual arbitrage. Its overall discount rate is thus:

$$n_d\left[i(1-\tau_{nc} f)\right] + n_e\left[i(1-\tau_d f)\right] \quad . \tag{10}$$

A similar logic for homeowners provides their discount rate:

$$h_d\left[i(1-\tau_h)\right] + h_e\left[i(1-\tau_d f)\right] \quad , \tag{11}$$

where all of mortgage interest is deducted, but only f of other interest income is subject to tax. Again, in this model, all agents are tied together by the interest rate i.

Clearly, the two models are not consistent with one another. If individuals do hold different assets and arbitrage away differences in

their rates of return, then a project financed by equity must earn a higher marginal product than the same project financed by debt. This latter scenario can be justified in a perfect certainty model only if for some reason firms must use a given mix of finance.

A more complete theory with risk could probably explain the simultaneous holding of assets with different rates of return. This paper abstracts from financial portfolio choice, however, in order to concentrate on real investment. Firm arbitrage is the standard assumption, because it is consistent with the segmented equilibrium suggested by Miller (1977). That is, the returns to the firm are equalized by arbitrage, and the net returns to debt and equity need not be equalized if they are held by individuals in different brackets. The importance of this choice is investigated by showing results for the alternative assumption of individual arbitrage.

3. Data and Parameters for the U.S.

This section describes the assignment of values to each of the parameters defined above. For convenience, it starts with capital stock shares, financing shares, and property tax rates. Other parameters and features of the tax code are described later in seven subsections: corporate tax rates, personal tax rates, capital gains, dividends, interest indexing, investment tax credits, and depreciation. Because these seven areas correspond to major components of either reform, current law and proposed changes can be described in each subsection.

First, the stock of each asset used in each industry is derived from Dale Jorgenson's unpublished estimates.[7] These 1977 capital stocks

[7]See Jorgenson and Sullivan (1981) and Fraumeni and Jorgenson (1980) for more detail on the procedures used to make these estimates.

are aggregated to 18 industries and converted from levels to shares. Rental and owner-occupied housing estimates are derived from the February 1981 Survey of Current Business.

Little is known about how firms decide to finance marginal investments, but this study uses existing proportions. The market value of outstanding debt and equity are estimated from COMPUSTAT tapes, and annual retentions and new share issues are taken from the Flow of Funds.[8] These data indicate that corporations finance 33.7 percent by debt, 61.4 percent by retentions, and 4.9 percent by new shares. Section 4 shows the sensitivity of results to this assumption.

Even less is known about the financing of noncorporate business, but the July 1982 Survey of Current Business indicates that the ratio of interest payments to an estimate of capital income in the noncorporate sector is almost identical to the same ratio in the corporate sector. A rough estimate, then, is that noncorporate firms also finance a third of their investments by debt and two-thirds by equity.

New homes are heavily mortgaged, but the loan to value ratio typically falls as the house ages. This study considers a permanent increase in the capital stock, with fixed sources of finance, so a permanent fraction for debt finance is approximated by total mortgage debt as a fraction of total market value. Unpublished estimates of the Census Bureau suggest that this ratio is again very close to one-third. The use of identical shares for debt in all three sectors will also serve to isolate and highlight the tax differences among them.

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[8] More detail on these procedures is provided on page 238 of King and Fullerton (1984).

Finally, before turning to the seven areas that would be affected by the proposals, consider the property tax on marginal investment. This tax is collected by over a thousand local taxing jurisdictions, so it is difficult to set these tax parameters by looking at the code. Some jurisdictions may offer special rebates or tax holidays for new business, but again the appropriate concept is the tax over the life of the asset. Assuming that new investments will pay the same property tax on average as existing investments, tax data from the Advisory Commission on Intergovernmental Relations and Jorgenson's capital stocks indicate rates of .00768 for equipment and inventories, .01126 for business land and structures, .01550 for public utilities, and .01837 for residential land and structures.

3.1 Corporate Tax Rates

The top federal statutory rate of .46 is used for marginal corporate income, since most all of the corporate capital is held by firms in this bracket. The weighted average of states' top-bracket rates is .0655, including zeros for states without corporate taxes, and using personal income to weight the fifty states.[9] Accounting for the deductibility of state taxes at the federal level, the appropriate value for u is .46+.0655(1-.46), which equals 49.5 percent.

The Treasury and White House proposals would set a single federal rate of .33 and maintain the deductibility of state corporate taxes. For these reforms, u is thus 37.4 percent.

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[9] A justification is given on page 204 of King and Fullerton (1984).

3.2 Personal Tax Rates

The marginal investment under consideration is an equiproportionate increase in all capital stocks, with an equiproportionate increase in the holdings of all investors. Additional debt and interest income, for example, would be distributed among debtholders in proportion to their current debt and interest income. The appropriate marginal tax rate is thus the average of all debtholders' marginal rates, weighted by their interest income.

For households, these tax rates were calculated from the TAXSIM model of the National Bureau of Economic Research.[10] Marginal rates for 25,000 households are weighted by each different source of income and shown in Table 1. Rates under the current law in the first column indicate that interest recipients are in relatively higher brackets than wage-earners, while dividend recipients are in higher brackets still. The 26 percent capital gains rate reflects the full taxation of realized gains, and the 19.5 percent noncorporate rate reflects the low brackets of many proprietors and partners with losses for tax purposes. All of these personal tax rates would be reduced by the Treasury proposal, as shown in the second column. Since that plan would reduce the top rate bracket proportionately more than other brackets, however, it reduces the weighted average rate on dividends and capital gains proportionately more than the rates on other forms of income.

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

TAXSIM calculations are not yet available for the White House plan, but the three brackets are very close to those of the Treasury plan.

Federal taxes are not the only personal taxes, and households are not the only recipients of these income types. In order to include state income taxes, 5 percentage points are added to each federal rate of the first column.[11] This percentage reflects the weighted average of the different states' rates, and the deductibility of state taxes at the federal level for those who itemize. 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.

The personal rate on interest is then adjusted to account for the taxation of banks, as described in King and Fullerton (1984, pages 223-226). The resulting rate for households must then be averaged with a zero rate for the interest income of nonprofit institutions, and a .368 rate for the interest income of life insurance companies. This rate reflects their 46 percent statutory rate and their 20 percent deduction for reserves under current law. The final estimate for τ_d is .231, as shown in the third column of Table 1. The same average under the Treasury proposal is .205, as shown in the fourth column. These rates for Treasury are also used for the White House plan.

The household rate on dividends is similarly raised to account for state taxes and reduced to account for the dividends received by tax-exempt institutions and insurance companies. The resulting value for τ_{ns} is .292 under current law and .242 under the proposals. The

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[11] See page 221 of King and Fullerton (1984).

noncorporate rate is raised by state taxes, but not reduced by any holdings of institutions. It is .245 and .218 under current law and the proposals, respectively. The rates for capital gains are discussed in the next subsection.

The weighted average rate for mortgage interest deductions is .25 at the federal level, raised to .30 to account for state taxes. Itemization is irrelevant, because the homeowner has a choice about how much to draw from a bank account. Itemization matters for deduction of property taxes, however, and the TAXSIM model indicates that about seventy percent are in fact deducted. Thus τ_h and λ are .30 and .7 respectively. The proposals would reduce this personal rate to .27 and eliminate deductibility of property taxes (λ=0).

3.3 Capital Gains

Current law excludes 60 percent of long-term capital gains, and the effective tax is approximately halved again by deferral.[12] Even after adding state taxes, the effective rate on accruals is 6 percent for households and 5.2 percent after accounting for tax-exempt institutions and insurance companies. On the other hand, current law taxes nominal capital gains (γ=0). The Treasury proposal would lower personal rates and index for inflation, but it would fully tax real gains when realized. After state taxes, halving for deferral, and averaging with institutions, τ_{re} would be .105 (with γ=1). The effect of this change can be seen in equation (5) or (9).

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[12] See King and Fullerton (1984, pages 221-222).

The White House plan 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.

3.4 Dividends

If the corporation gives up a dollar of retentions under current law, it is able to pay one dollar of dividends gross of personal taxes. Thus θ is one. Suppose instead that a fraction g of dividends are deductible against the corporate tax. The dollar of retentions corresponds to $1/(1-u)$ dollars of before-tax earnings, and if these earnings were paid out in dividends, then $(1-g)$ of them would be taxed at rate u. After corporate tax, dividends would be $1/(1-u)$ times $1-(1-g)u$. Thus the dividends per dollar of forgone retentions is $\theta = (1-u+gu)/(1-u)$. With $u=.374$ and half of dividends deductible under the Treasury proposal, θ would be 1.299. With a ten percent deduction under the White House plan, θ is 1.060.

The effect of such a change can be seen in equation (5) for the case of firm arbitrage, where a larger dividend means that the recipient earns a higher return. In equation (9) for individual arbitrage, it means that the firm does not need to earn as much to provide the required after-tax return to the saver.

3.5 Interest Indexing

Nominal interest income currently is taxed in the U.S., and so f is set to one. In fact, the world has very little experience with

attempts to index income, especially interest income. Because the Treasury would undertake several other types of indexing, however, it may be important to deal with the indexation of interest as well. Tax shelters could become even more profitable if high-bracket individuals were able to deduct nominal interest payments while being taxed only on the real part of their income from other investments.

The Treasury recognizes the administrative difficulties of trying to measure real interest income or expense, and so it suggests a more practical procedure that is intended to have approximately the same effect. By knowing the inflation rate π, and assuming a 6 percent real return at the outset, it can estimate the inflationary portion of the nominal interest by $\pi/(.06+\pi)$. With 4 percent inflation, for example, the excluded part is .4, and f is set to .6 in equations (5)-(11). All of mortgage interest is still deductible.

Incentive effects of this system include the real effects of the approximation used by the Treasury. To separate the effects of this approximation from the effects of interest indexing alone, calculations are also performed for a more conceptually "pure" version of interest indexing. Mortgage interest is left fully deductible, but equations (5) through (11) are rewritten such that exactly $(i-\pi)$ is deductible to the corporation and taxable to the individual. As seen below, the Treasury Department's approximation works very well when the real interest rate is in fact close to .06, but not otherwise.

The White House would not index interest income or expense.

3.6 Investment Tax Credits

In the 1960's and 70's, investment tax credits were used selectively to stimulate or slow the macroeconomy. As a temporary device, they may have been limited to equipment because of the shorter time required to order and buy such assets. Since they have become permanent, however, investment tax credits have provided strong incentive for businesses to shift away from the otherwise efficient mix of assets. Current law provides a six percent credit for automobiles, a ten percent credit for other equipment, a ten percent credit for public utility structures, and no credit for buildings, inventories, or land. Both the Treasury and the White House plan would repeal these credits.

3.7 Depreciation

Great potential for noneutralities arise because 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 these 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 and 14 types of structures, followed by inventories and land. This is a very 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) and shown in the first column of Table 2. These range from a high of .333 for autos to a low of .019 for certain buildings. Inventories and land do not depreciate.

The second column of Table 2 shows the investment tax credits discussed above, and the third column shows the lifetimes currently available under the 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. Allowances over these lifetimes can be read from tables in the law, but 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 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.[13]

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 uses the Hulten-Wykoff estimates to group together similar assets into seven 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.[14]

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[13]The exact formula for z is shown in King and Fullerton (1984, page 211). Analogous formulae are used for the Real Cost Recovery System and the Capital Cost Recovery System.

[14]For comparability with current 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 page 161 of Tax Reform for Fairness, Simplicity, and Economic Growth.

These allowances closely match the estimated real rates of depreciation. Since all remaining basis is deducted in the close-out year, however, allowances are slightly accelerated relative to the estimated exponential rates. Moreover, this near neutrality is based on the estimates of economic depreciation. If δ are mismeasured in some way, then marginal effective tax rates are mismeasured.

The White House proposes a Capital Cost Recovery System (CCRS) with six asset classes, higher exponential allowances, a switch to straight line at the optimal time, and indexation for inflation, Deductions are not bunched in the close-out year as in RCRS.[15]

4. Results

In the first subsection below, one set of assumptions is used to provide detailed results for the 36 assets in the model, and for 18 private industries. In order to see the impact and importance of indexing interest, depreciation, and capital gains, each of seven components are introduced one at a time 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. Detailed calculations are available for each special case, but later tables save space by aggregating the results separately over the 20 kinds of equipment, the 5 public utility structures, and the 9 other structures.

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[15]Calculations use the formula on page 211 of King and Fullerton (1984), with a real discount rate. The White House grouping of assets may be seen on page 145 of The President's Tax Proposals to the Congress for Fairness, Growth, and Simplicity.

4.1 Detailed Results for the Standard Assumptions

The fourth column of Table 2 shows current marginal effective total tax rates in the corporate sector for each asset, including corporate taxes, personal taxes, and property taxes. 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. These credits and deductions are taken against the tax that the corporation would otherwise have to pay on its previous investments. Assuming that the firm has sufficient tax liability to make use of these benefits, the subsidy at the corporate level is in fact large enough to offset the personal and property taxes as well as corporate taxes.

Structures have rates between 25 and 45 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 their effective rates well below the combination of statutory tax rates.

The fifth column of Table 2 indicates that the Treasury proposal would indeed measure and tax economic income, subject to the caveats mentioned in the previous section. 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. Misallocations among these assets would diminish accordingly.

The last column shows the White House plan, where allowances are re-accelerated, particularly for equipment. The repeal of investment tax credits insures positive rates on all assets, however.

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 private 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. All industries' rates would be increased by the Treasury plan, and most would be increased by the White House plan, but the reasons are best explained by looking at component parts.

4.2 Components of the Treasury Proposal

As a basis of comparison, results for current law are summarized in the first column of Table 4, where the assets are aggregated separately for equipment, structures, public utilities, inventories, and land. The corporate sector rates reflect those in Table 2, where equipment was subsidized and other assets were differentially taxed. The overall 31.1 percent rate in the corporate sector is not much different from the 30.7 percent rate in the noncorporate sector, 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 17.2 percent rate on owner-occupied housing reflects only the state and local property taxes, reduced to the degree that these taxes

are 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 26.3 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 current law, with 4 percent inflation, the nominal interest rate must be 13.16 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 11.58 percent to provide the same real net return.[16]

The Treasury Department's approximation formula recognizes the difficulty of trying to measure and tax real interest income, but the

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[16]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.

third column of this table shows the results of the more conceptual experiment of "pure" interest indexing. Effective tax rates are in fact 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. In other experiments, the inflation rate was varied from zero to 10 percent. Effective tax rates all start out at the same place, but those for Treasury indexing increase about twice as fast as those for pure indexing (while both types increase relative to current law with its nominal interest deductions).

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 to equipment and public utility structures only. The fourth column of Table 4 shows this component by itself, where rates for equipment rise from -.183 to +.361, and the overall corporate sector rate rises from .311 to .400. 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.[17] The repeal of investment tax credits would reduce this measure by as much as any other component, from .0171 to .0130. Remaining variation stems from accelerated depreciation allowances and the nontaxation of owner-occupants' imputed net rents.

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[17]The weighted standard deviation shows potential for interasset distortions only. Since effective tax rates are increased by ITC repeal, intertemporal distortions may offset interasset welfare gains.

The next component would fully tax all realized capital gains but index the basis for inflation. This model does not capture potential for increased retentions, realizations, tax certainty, or horizontal equity. It does capture the reduced dependence of taxes on inflation, as shown below. Effective tax rates in the fifth column are slightly lower than those of the current 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 White House plan 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.[18] The dividend deduction might encourage firms to change their financing shares, however, as discussed below.

The reduction of the corporate rate from 46 to 33 percent also would have little effect on tax rates, as shown in the seventh column of

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[18]This argument does not depend upon q being less than one as in Auerbach (1979), Bradford (1981), and King (1977).

Table 4. The reduced tax on equity is offset by the reduced advantage of nominal interest deductions. Under the assumption of firm arbitrage, however, the high corporate rate drives s^c well below s^{nc}. Similar effective tax rates mean that the various ρ^c are well 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.

Finally,[19] 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.

In broader perspective, the effect of each component depends on whether it is introduced by itself, as shown here, or in combination with other components. As expected, some components by themselves would raise effective tax rates while others would reduce them. At least for this model with the standard set of parameters, however, the tax-increasing effects are 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 nonexistant for the corporate rate reduction. The next section shows the relative size of these components for other assumptions.

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[19] 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 still negative, but the division by ρ changes the sign of the effective tax rate and makes it difficult to interpret at best. These depreciation rules may work well with other components of the two tax plans, but they enlarge the subsidy for some equipment when combined with the current investment tax credits and nominal interest deductions.

4.3 Alternative Models and Assumptions

Results for the standard assumptions are reproduced in the first three 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 26.3 to 33.5 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 .0171 to .0117.

Corporate sector rates are raised by the White House plan with these assumptions, but they are still lower than for the Treasury plan. Interasset differences are greater than under the Treasury, but intersectoral differences are less. The latter effect seems to dominate, as the weighted standard deviation falls to .0093.

Results for individual arbitrage are shown in the next three columns. With this assumption under current law, effective tax rate estimates are higher for all assets in such a way that disparites remain but equipment is no longer subsidized. However, the more uniform treatment of different investors under the Treasury and White House plans means that estimates of effective tax rates are much less sensitive to this change of assumption. Still the Treasury plan is found to increase marginal effective total tax rates, from 38 to 44 percent in the corporate sector and from 30 to 34 percent overall.

With this assumption, however, the White House plan would reduce the current rate in the corporate sector from 38 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 three columns, for the case of firm arbitrage. With a 3 percent net return instead, current rates vary from -59 percent for equipment to +47 percent for structures. The Treasury and White House plans would still tend to equalize effective tax rates, but at higher levels.

One of the striking features of current law is the sensitivity of taxes to inflation. This sensitivity is demonstrated for some assets in Figure 1, where taxes on corporate land and inventories[20] fall with inflation because of nominal interest deductions (at a corporate rate greater than the personal rate on interest receipts).[21] Taxes on depreciable assets increase with inflation because of historical cost depreciation, despite the same 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 in Figure 1.

The most innovative features of the Treasury plan were designed specifically to deal with the scattered effects of inflation shown in

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[20]The assumption of tax-minimizing behavior by firms includes the strong assumption of LIFO inventory accounting, as described in section 2. Under FIFO accounting, inflation would increase inventory taxes.

[21]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).

Figure 1. When indexation of interest, depreciation and capital gains are combined with the other features of the Treasury proposal, Figure 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.

The White House plan would drop interest indexing, but Figure 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 only fall slightly with inflation. Figure 3 also shows how CCRS retains some corporate asset differences.

4.4 Other Special Cases

If individuals and firms are mobile and fully informed, then the Tiebout (1956) Hypothesis would suggest that the property tax is not a distorting tax at all but a voluntary payment for local public services. Effective tax rates for the three sectors and for the whole economy are shown for the standard parameters in the first panel of Table 6 and for the case with no property tax in the second panel. These calculations indicate that property taxes make a big difference, constituting most of the total tax rate under current law and the White House proposal, and almost half of the total tax rate under the Treasury plan.

Property taxes represent the only tax on owner-occupied housing, a sector which makes up one-third of the total capital stock. Without them, owner-occupied housing is subsidized by the fact that 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 is only nine percent of the pretax return.

Many investments that qualify for credits and deductions are undertaken by start-up firms that have not yet turned a profit, or by older firms with indefinite loss positions. For the extreme case where credits are never used and income from the investment is never taxed, effective rates are shown in the third panel of Table 6. These calculations also represent the effects of corporate tax repeal (without trying to tax corporate income at the personal level). The current rate in the corporate sector is only slightly reduced from the standard case, indicating that the corporate tax is completely offset by credits, allowances, and nominal interest deductions.[22] It may distort allocation without collecting any revenue from the marginal investment. Under the Treasury and White House plans, the corporate tax does collect revenue at the margin. Changes in the other sectors are caused by changes in the nominal interest rate.

Finally, Stiglitz (1973) has suggested that investments can be totally debt financed at the margin. This case is presented in the fourth panel of Table 6, where the entire corporate sector is now subsidized at a 27.5 percent rate (despite positive personal and property taxes). Debt makes the least impact under the Treasury plan, where interest deductions and receipts are indexed.

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[22]At a seven percent rate of inflation, these deductions more than offset the corporate tax.

At the other extreme, a marginal corporate investment financed entirely by equity would pay 55 percent under current law, 49 percent under the Treasury plan, and 47 percent under the White House plan, as shown in the fifth panel. These plans reduce the tax on equity, because the corporate rate reduction and dividend deduction more than compensate for the loss of investment tax credits.

Under current law, the tax on equity (.553) is clearly greater than the tax on debt (-.275). The Treasury plan would reduce this disparity most, raising the tax on debt (to .306) and reducing the tax on equity (to .491). It would reduce distortions in financial decisions accordingly. 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 43.1 percent to 44.6 percent.

5. Conclusion

Despite much recent interest in a consumption tax, 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. 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. It finds that the current system is characterized by effective tax rates that increase with inflation for some assets and decrease with inflation for other assets. 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 White House plan, effective tax rates in the corporate sector might rise or fall from current law, depending on assumptions. This plan reduces intersectoral differences and is only moderately affected by inflation.

Table 1

Personal Tax Rates

Type of Income	From TAXSIM Model (Federal Only)[1]		After Adjustments (Federal plus State)[2]	
	1985 Law	Treasury Plan	1985 Law	Treasury Plan
Wages and Salaries[3]	.254	.208	.304	.268
Interest Received	.278	.219	.231	.205
Dividends Received	.339	.262	.292	.242
Capital Gains	.261	.208	.052	.105[4]
Noncorporate Income	.195	.158	.245	.218
Housing Deductions	.250	.210	.300	.270

1. Much help was provided by Lawrence Lindsey in providing all TAXSIM estimates.

2. 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.

3. The tax rate on wages and salaries is provided for comparison purposes only.

4. This 10.5 percent rate reflects full taxation of real capital gains after deferral.

Table 2

Tax Parameters for Each Asset, and Marginal Effective Total Tax Rates in the Corporate Sector

		Economic Depreciation Rate	Investment Tax Credit	ACRS Tax Lifetime	Marginal Effective Total Tax Rates		
					1985 Law	Treasury Plan	White House Plan
1	Furniture and Fixtures	.110	.10	5	-.155	.398	.243
2	Fabricated Metal Products	.092	.10	5	-.136	.376	.226
3	Engines and Turbines	.079	.10	5	-.123	.412	.249
4	Tractors	.163	.10	5	-.213	.393	.243
5	Agricultural Machinery	.097	.10	5	-.141	.382	.231
6	Construction Machinery	.172	.10	5	-.224	.401	.249
7	Mining and Oil Field Machinery	.165	.10	5	-.215	.394	.245
8	Metalworking Machinery	.123	.10	6	-.168	.413	.254
9	Special Industry Machinery	.103	.10	5	-.148	.390	.236
10	General Industrial Equipment	.123	.10	5	-.168	.413	.254
11	Office and Computing Machinery	.273	.10	5	-.355	.417	.266
12	Service Industry Machinery	.165	.10	5	-.215	.394	.245
13	Electrical Machinery	.118	.10	5	-.163	.407	.250
14	Trucks, Buses, and Trailers	.254	.10	5	-.328	.405	.257
15	Autos	.333	.06	3	-.273	.382	.256
16	Aircraft	.183	.10	5	-.237	.410	.256
17	Ships and Boats	.075	.10	5	-.119	.407	.244
18	Railroad Equipment	.066	.10	5	-.110	.392	.202
19	Instruments	.150	.10	5	-.198	.381	.235
20	Other Equipment	.150	.10	5	-.198	.442	.277
21	Industrial Buildings	.036	.00	18	.415	.460	.367
22	Commercial Buildings	.025	.00	18	.372	.434	.341
23	Religious Buildings	.019	.00	18	.348	.419	.327
24	Educational Buildings	.019	.00	18	.348	.419	.327
25	Hospital Buildings	.023	.00	18	.367	.430	.338
26	Other Nonfarm Buildings	.045	.00	18	.445	.480	.387
27	Railroads	.018	.10	15	.285	.409	.284
28	Telephone and Telegraph	.033	.10	15	.320	.440	.300
29	Electric Light and Power	.030	.10	15	.313	.434	.297
30	Gas Facilities	.030	.10	10	.240	.434	.297
31	Other Public Utilities	.045	.10	10	.258	.461	.312
32	Farm Structures	.024	.00	18	.368	.431	.339
33	Mining, Shafts and Wells	.056	.00	5	.262	.502	.409
34	Other Nonbuilding Facilities	.029	.00	18	.389	.444	.351
35	Inventories	.000	.00		.416	.424	.388
36	Land	.000	.00		.449	.448	.419

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

2. Economic depreciation rates come from Hulten and Wykoff (1981), and for assets 27-31, from Jorgenson and Sullivan (1981).

Table 3

Marginal Effective Total Tax Rates by Industry, Including All Taxes in the Corporate, Noncorporate, and Housing Sectors[1]

	Industry	1985 Law	Treasury Plan	White House Plan
1	Agriculture, Forestry and Fisheries	.313	.320	.310
2	Mining	.254	.412	.316
3	Crude Petroleum and Gas	.307	.462	.375
4	Construction	.296	.383	.332
5	Food and Tobacco	.345	.428	.358
6	Textile, Apparel and Leather	.332	.422	.351
7	Paper and Printing	.289	.423	.337
8	Petroleum Refining	.370	.438	.364
9	Chemicals and Rubber	.272	.421	.333
10	Lumber, Furniture, Stone, Clay and Glass	.313	.423	.346
11	Metals and Machinery	.340	.428	.357
12	Transportation Equipment	.376	.430	.370
13	Motor Vehicles	.289	.426	.343
14	Transportation, Communication and Utilities	.212	.417	.290
15	Trade	.358	.402	.356
16	Finance and Insurance	.328	.364	.325
17	Real Estate	.220	.260	.259
18	Services	.185	.371	.285

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

Table 4

Summary Statistics for Each Component of the 1984 Treasury Plan[1]

	1985 Law	Treasury Indexing[2]	"Pure" Indexing[3]	Repeal ITC[4]	Capital Gains[5]	Dividend Deduction[6]	Corporate Rate Reduction[7]	Personal Rate Reduction[8]
Corporate Sector Tax Rates								
Equipment	-.183	.096	.058	.361	-.199	-.225	-.058	-.256
Structures	.379	.451	.436	.379	.372	.360	.371	.363
Public Utilities	.295	.375	.358	.407	.287	.274	.294	.277
Inventories	.416	.511	.496	.416	.409	.397	.408	.392
Land	.449	.530	.516	.449	.442	.431	.436	.429
Overall Corporate	.311	.417	.398	.400	.303	.289	.315	.285
Noncorporate Sector Tax Rates								
Equipment	-.101	-.097	-.098	.249	-.101	-.102	-.111	-.124
Structures	.281	.285	.285	.281	.281	.281	.286	.265
Public Utilities	.210	.214	.214	.310	.210	.210	.217	.195
Res. Structures	.326	.331	.331	.326	.327	.327	.334	.314
Inventories	.305	.309	.309	.305	.305	.305	.309	.283
Land	.333	.337	.336	.333	.333	.333	.338	.312
Residential Land	.382	.386	.386	.382	.382	.382	.389	.364
Overall Noncorporate	.307	.311	.311	.321	.307	.308	.313	.289
Owner-Occupied Housing Tax Rate	.172	.148	.152	.172	.172	.173	.182	.178
Overall Tax Rate	.263	.305	.297	.295	.261	.258	.272	.250
Standard Deviation	.0171	.0168	.0159	.0130	.0171	.0171	.0133	.0175
Interest Rate	.1316	.1158	.1177	.1316	.1314	.1311	.1279	.1275

1. Marginal effective total tax rates in each sector, for the case of 4 percent inflation, firm arbitrage, and a 5 percent net rate of return.
2. The only change from 1985 law is the Treasury's version of interest indexing.
3. The only change from 1985 law is the "pure" version of interest indexing.
4. The only change from 1985 law is the repeal of investment tax credits.
5. The only change from 1985 law is the full taxation of real capital gains.
6. The only change from 1985 law is the deduction for 50 percent of corporate dividends paid.
7. The only change from 1985 law is the reduction of u from .495 to .374.
8. The only change from 1985 law is the reduction of personal rates shown in Table 1.

Table 5

Summary Statistics for Different Assumptions[1]

	Firm Arbitrage (s=.05)			Individual Arbitrage (s=.05)			Firm Arbitrage (s=.03)		
	1985 Law	Treasury	White House	1985 Law	Treasury	White House	1985 Law	Treasury	White House
Corporate Sector Tax Rates									
Equipment	-.183	.402	.245	.046	.410	.269	-.587	.421	.273
Structures	.379	.456	.363	.409	.460	.383	.468	.489	.392
Public Utilities	.295	.435	.297	.327	.439	.302	.403	.478	.380
Inventories	.416	.424	.388	.478	.431	.406	.403	.446	.405
Land	.449	.448	.419	.496	.453	.431	.465	.483	.455
Overall Corporate Rate	.311	.431	.344	.376	.437	.360	.333	.461	.380
Noncorporate Sector Tax Rates									
Equipment	-.101	.273	.202	-.133	.282	.212	-.199	.311	.246
Structures	.281	.314	.280	.299	.325	.289	.333	.363	.325
Public Utilities	.210	.328	.259	.233	.343	.276	.276	.390	.333
Residential Structures	.326	.353	.327	.351	.369	.343	.395	.421	.395
Inventories	.305	.289	.287	.317	.299	.296	.338	.329	.326
Land	.333	.320	.317	.349	.332	.329	.377	.372	.369
Residential Land	.382	.373	.371	.404	.390	.388	.443	.443	.441
Overall Noncorporate Rate	.307	.327	.310	.325	.340	.323	.357	.382	.366
Owner-Occupied Housing Tax Rate	.172	.217	.230	.191	.210	.241	.263	.342	.339
Overall Tax Rate	.263	.335	.294	.304	.341	.311	.318	.398	.360
Standard Deviation	.0171	.0117	.0093	.0137	.0108	.0071	.0146	.0070	.0078
Interest Rate	.1316	.1111	.1230	.1170	.1026	.1132	.1024	.0861	.0954

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

Table 6

Summary Statistics for Special Cases

	1985 Law	Treasury	White House
A. Standard Parameters[1]			
Corporate Sector Tax Rate	.311	.431	.344
Noncorporate Sector Tax Rate	.307	.327	.310
Owner-Occupied Housing Tax Rate	.172	.217	.230
Overall Tax Rate	.263	.335	.294
B. No Property Tax			
Corporate Sector Tax Rate	.136	.350	.214
Noncorporate Sector Tax Rate	.185	.204	.180
Owner-Occupied Housing Tax Rate	-.059	-.134	-.054
Overall Tax Rate	.094	.184	.121
C. No Corporate Income Tax			
Corporate Sector Tax Rate	.289	.265	.283
Noncorporate Sector Tax Rate	.331	.336	.328
Owner-Occupied Housing Tax Rate	.217	.237	.267
Overall Tax Rate	.284	.283	.293
D. All Debt			
Corporate Sector Tax Rate	-.275	.306	.065
Noncorporate Sector Tax Rate	.312	.334	.311
Owner-Occupied Housing Tax Rate	.114	.062	.181
Overall Tax Rate	.106	.250	.197
E. All Equity			
Corporate Sector Tax Rate	.553	.491	.474
Noncorporate Sector Tax Rate	.305	.323	.309
Owner-Occupied Housing Tax Rate	.199	.291	.254
Overall Tax Rate	.334	.377	.340

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

Figure 1

Marginal Effective Total Tax Rates (METTR) Under Current Law

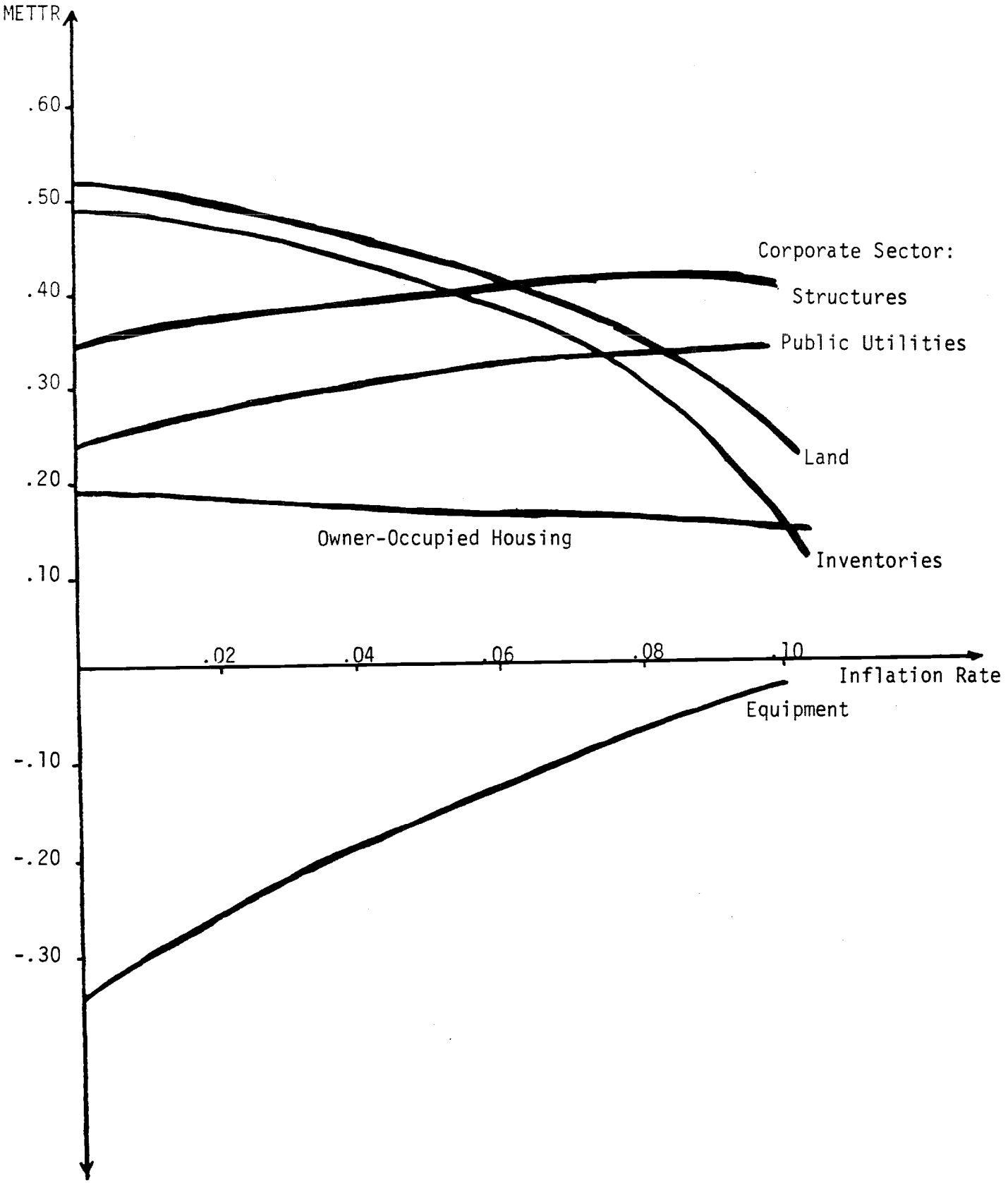


Figure 2

Marginal Effective Total Tax Rates (METTR) Under the Treasury Plan

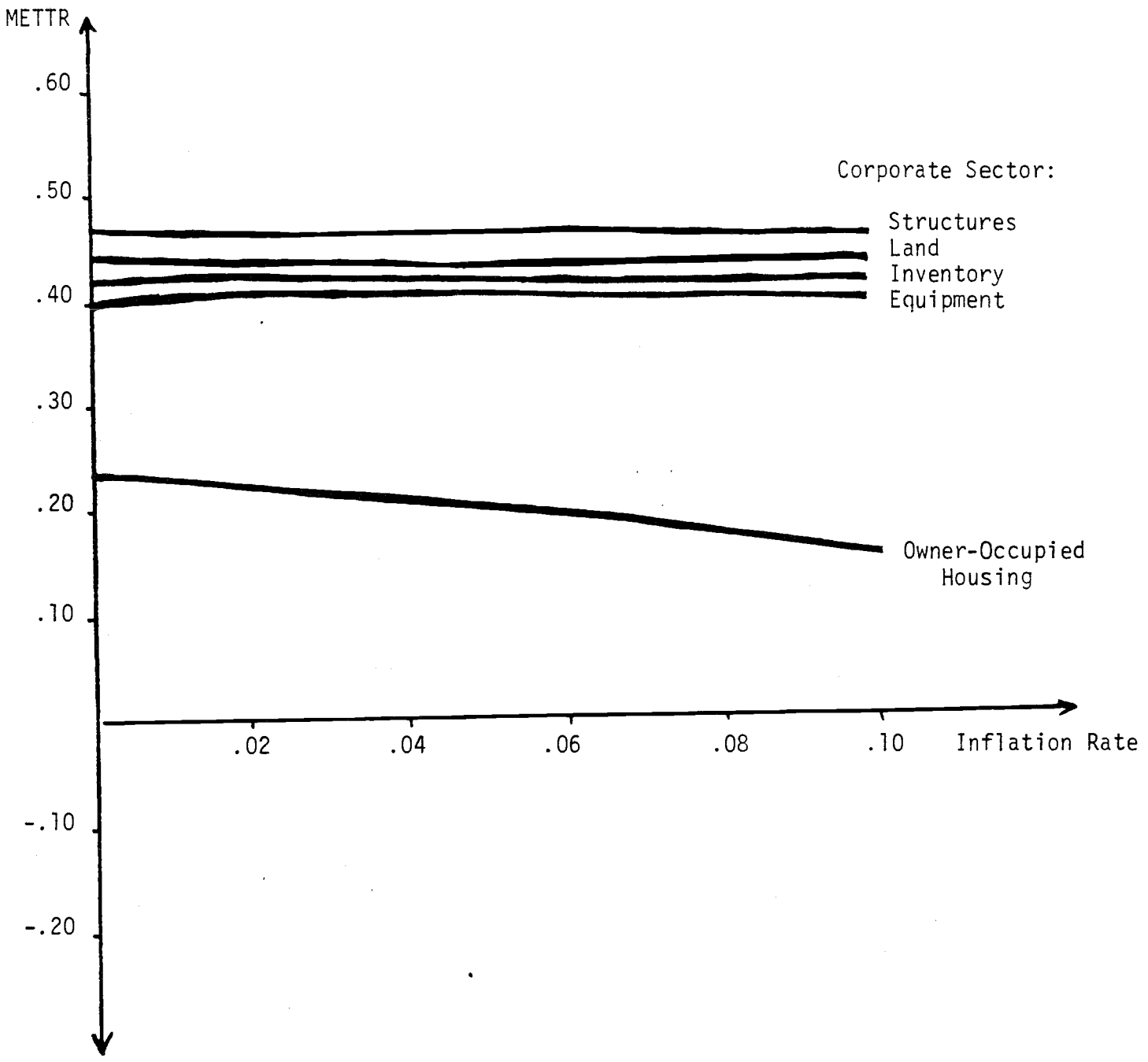
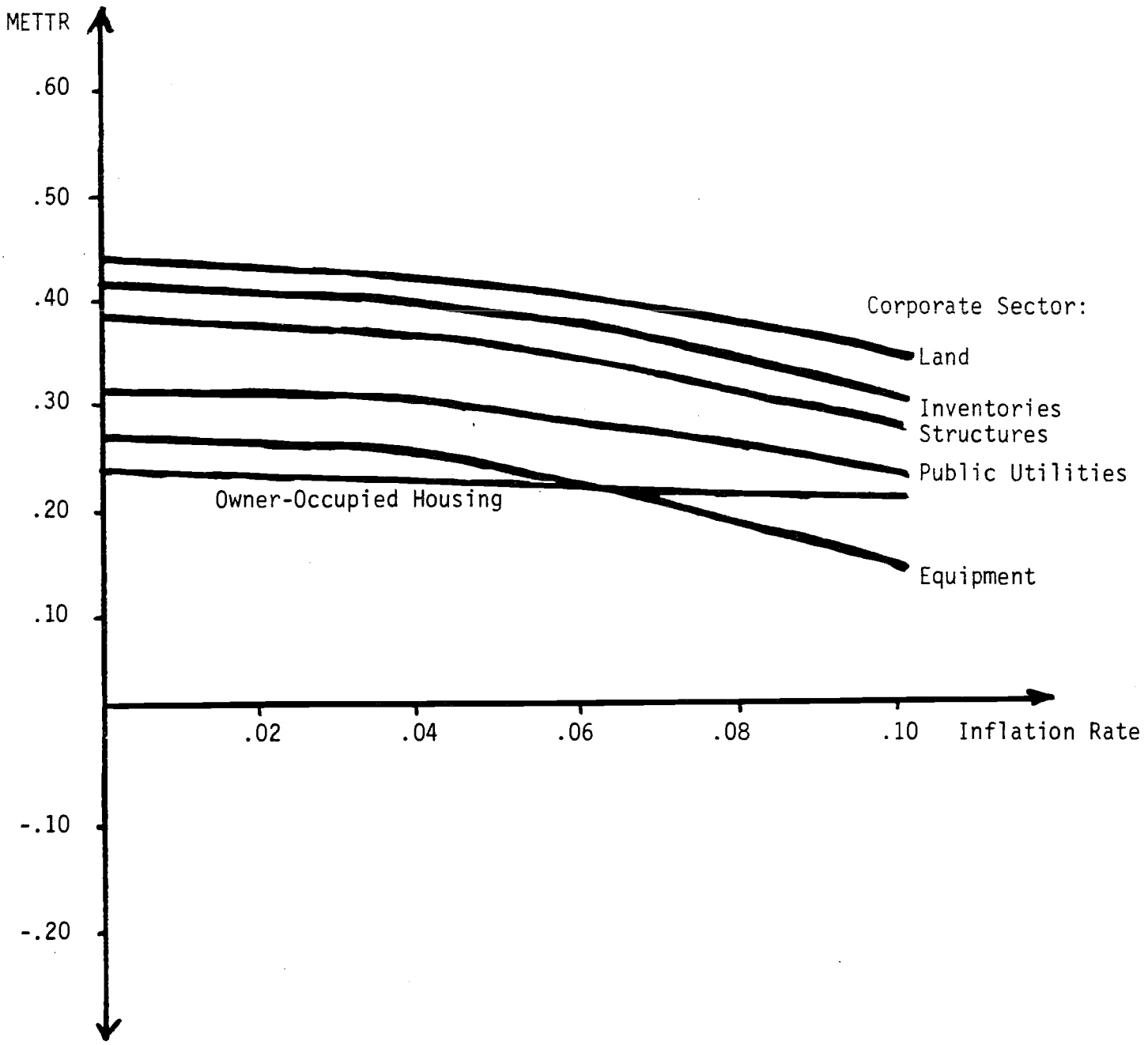


Figure 3

Marginal Effective Total Tax Rates (METTR) Under the White House Plan



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