NBER WORKING PAPER SERIES

TAX REFORM AND FINANCIAL MARKETS

Patric H. Hendershott

Working Paper No. 1707

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
September 1985

Prepared for a conference on the Impacts of Tax Reform sponsored by the Federal Reserve Bank of Boston. I am indebted to Thomas Downs for his assistance in the analysis of stock prices, to Stephen Buser for his insights on corporate finance, and to Edward Kane for editorial comments and discussions regarding the entire manuscript. The research reported here is part of the NBER's research programs in Financial Markets and Monetary Economics and Taxation and projects in Government Budget and Taxation and Capital Formation. Any opinions expressed are those of the author and not those of the National Bureau of Economic Research.

NBER Working Paper #1707
September 1985

Tax Reform and Financial Markets

ABSTRACT

Four tax reform proposals have been advanced in recent years: Bradley-Gephardt, Kemp-Kasten, Treasury-Department and the Administration plan. These plans could have significant impacts on financial markets. Reductions in investment incentives and marginal tax rates would tend to lower before-tax interest rates, and lower taxes on existing corporate capital would tend to increase stock prices. The pattern of security issues would be altered by resulting changes in the composition of investment between real estate and nonreal estate assets and in desired loan-to-value ratios. The paper compares and contrasts the likely impacts of each of the four reform proposals on interest rate (taxable and tax-exempt), security flows, and stock prices.

Patric H. Hendershott
321 Hagerty Hall
The Ohio State University
1775 College Road
Columbus, Ohio 43210
(614) 422-0552

Tax Reform and Financial Markets

Patric H. Hendershott

The Ohio State University and the NBER

Four major tax reforms have been proposed in recent years: Bradley-Gephardt, Kemp-Kasten, Treasury I and Treasury II. These reforms seek to improve economic efficiency by taxing different capital assets and sources of income more equally. Each reform is purported to be revenue-neutral from the perspective of the U.S. Treasury and distributionally neutral across households. While this alleged neutrality is probably (certainly, in some instances) overstated, it is analytically convenient to assume revenue and distribution neutrality. It is also convenient to abstract from growth and inflation effects.

Even with revenue and growth neutrality, the reforms could substantially impact financial markets. Reductions in investment incentives and marginal tax rates would tend to lower before-tax interest rates,[1] and lower taxes on existing corporate capital would tend to increase stock prices.[2] The pattern of security issues would be altered by resulting changes in the composition of investment between real estate and nonreal estate assets and in desired loan-to-value ratios. The paper compares and contrasts the likely impacts of each of the four reform proposals on interest rates (taxable and tax-exempt), security flows, and stock prices.

I. Tax Reform and Interest Rates

The analysis is built around a diagram in which the interaction of the demand for and supply of (funds for) real capital determines before-tax interest rates. Tax reforms can reduce the level of before-tax interest rates by lowering the demand for real capital (reducing investment incentives) and/or by raising the supply of funds for real capital accumulation (lowering marginal tax rates on saving). Whether a specific tax reform will lower before-tax interest rates and by how much depends on how the reform is structured.

Comparative-static analysis focuses on the separate impact of the various reforms on the supply and demand curves for real capital. The supply-curve analysis evolves into a discussion of how reforms will likely alter the relation between tax-exempt and taxable yields. Putting the separate shifts together provides specific estimates of rate declines under the various reforms. These estimates depend heavily on the assumed interest elasticities of the the domestic and net foreign supplies of capital (saving). Because wide disagreement exists over these elasticities, any estimate of the expected decline in interest rates in response to tax reform is bound to be controversial.

A. A Graphical Analysis

The demand for real capital depends positively on the level of real output and negatively on the rental price of capital (c). This price is related to the economic depreciation rate (d), the required real return the firm must earn (r), and various business tax parameters (Hall and Jorgenson, 1967):

$$c = (r+d)\frac{1-k-\tau z}{1-\tau}, \qquad (1)$$

where k is the investment tax credit, τ is the business income tax rate and z is the present value of tax depreciation deductions. The required real return, in turn, depends on personal tax rates and risk factors, as well as the level of before-tax interest rates and the expected inflation rate. An increase in before-tax interest rates raises r and thus c, thereby lowering the demand for capital.

Figure 1 illustrates the impact of tax reform on the level of interest rates and the allocation of real capital between residential and nonresidential uses in a fixed-capital allocation model. The negative impact of interest rates on quantity-demanded is plotted; the other components of the rental price -- business tax rates, τ, tax depreciation schedules, z, and the investment tax credit, k, -- are shift parameters in the demand functions. Under current law (τ^o, z^o and k^o), the level of interest rates is i^o, residential capital is RES^o, and nonresidential capital is K^o-RES^o. The supply schedule is drawn as a vertical line to reflect the fixed capital stock. With all of the schedules interpreted as fractions of income, the analysis can be reinterpreted in a growth context.

I begin with a simple tax change: the elimination of the investment tax credit (setting k=0) espoused in all tax reform proposals. The total demand schedule, $K(\tau^o,z^o,k^o)$, drops down to $K(\tau^o,z^o,0)$, the interest rate declines to i', the quantity of residential capital increases to RES' and the quantity of nonresidential capital decreases to K^o-RES'. The fixed-capital assumption is appropriate for analyzing the impact of tax reform on interest rates if the interest elasticity of domestic saving is zero and either the interest elasticity of net foreign saving is zero or foreign central banks move foreign interest rates such that net foreign saving is unchanged.

The opposite assumption would be to make the supply of capital perfectly elastic. Summers (1981) notes that the long-run interest rate elasticity of saving is infinite in an unfettered life-cycle model where households have a strong bequest motive. Figure 2 has been constructed so that it can illustrate the impact of tax reform on interest rates in this opposite case, where the supply elasticity comes from domestic, not foreign, saving. The horizontal supply of capital is drawn at $i^o = \rho/(1-t^o)$, where ρ is the fixed after-tax return to savers and t^o is the tax rate built into taxable interest rates. If the tax reform is the removal of the investment tax credit analyzed in Figure 1, the demand curve would drop and the quantity of nonresidential capital would decrease. The interest rate and quantity of residential capital would be unchanged. A more interesting reform is analyzed in Figure 2: a decrease in t from t^o to t'. For simplicity, the decrease is assumed not to affect the demand for capital, although this is virtually an impossible case owing to the relationship between t and τ. The interest rate declines from i^o to $i' = \rho/(1-t')$, and the total stock of capital rises from K^o to K'. Residential and nonresidential components of capital increase in proportion to their interest-rate sensitivities.

I next examine a world where domestic saving has zero interest elasticity but international capital flows are perfectly interest elastic. In this model, the level of world interest rates is determined by a fixed supply of world capital and the demand for real capital in all countries. The RES demand curve in Figure 1 could be redefined as the total American demand for capital and the K curve as the world demand for capital. In this case, a tax reform that reduced after-tax returns to American savers (such as the decrease of t^o to t') would not alter either the aggregate supply of capital or the level of American (world) interest rates. As before, the level of American rates (world rates generally) would decline in response to a negative change in a demand shift

parameter, such as the removal of the investment tax credit analyzed in Figure 1. However, the decline would be smaller for an open economy than a closed one because the demand for world capital should be more responsive to interest rate changes than should be the demand for American capital alone. In effect, American nonresidential capital is reallocated to foreign capital as well as to American residential capital.

Figure 3 portrays the presumably realistic case of positive, but finite, interest rate elasticities in both the domestic (S_d) and net foreign ($S-S_d$) supplies of capital. Limitations on the domestic elasticity follow from adding capital market constraints to the life-cycle model and restricting the bequest motive. Limitations on the foreign elasticity recognize the major role the U.S. plays in world capital markets. The supply schedules are drawn so that a positive net foreign supply of capital, $K^o - K_d^o$, exists at the initial level of American interest rates, i^o. A decrease in t from t^o to t' (the reader should ignore the shift in the demand schedule for the moment) lowers the domestic supply schedule vertically to $\rho/(1-t')$ and shifts the total supply schedule sympathetically. The net result is a decline in i to i', an increase in the total American capital stock to K', and a reduction in net foreign holdings of American capital to $K'-K_d'$. The latter translates into an improvement in the U.S. trade deficit.

Combining the previous analyses, I now deduce the interest rate response to a broad tax reform that shifts both the supply and demand schedules. Specifically, the tax credit is eliminated, and t is cut to t'. For convenience, the demand curve is assumed to shift downward by exactly enough to maintain the existing level of the American capital stock at K^o. As the schedules are drawn, the net foreign demand for American capital, which was originally positive, is zero, and the interest rate has declined to i".

The impact of any tax reform on the level of American interest rates is thus seen to depend fundamentally on the size of the resulting downward shifts in the demand and domestic-supply curves. Three interest rate elasticities are also important: (1) the interest elasticity of foreign saving (after allowance for foreign central bank actions to adjust foreign interest rates to "exogenous" shifts in American rates), (2) the interest rate elasticity of domestic saving, and (3) the interest elasticity of the demand for capital. The next two sections of the paper explain how to obtain estimates of the downward shifts in the domestic supply of capital and the demand for capital. The supply-side analysis treats the yield on tax-exempt securities as the return to high-income savers and asks how far the level of taxable interest rates would have to fall under the various reforms to maintain tax-exempt yields at prereform levels. The demand-side analysis asks how far the level of rates would have to fall to maintain the aggregate demand for capital (and thus the level of net investment) at its prereform level, assuming a fixed total supply of capital.

B. Tax Reform, Tax-Exempt Yields, and the Supply of Domestic Saving

Most saving is almost certainly done by high-income households who consider tax-exempt securities to be a competitive investment. Thus a reasonable measure of the downward shift in the supply of domestic saving schedule is the decrease in the level of taxable interest rates necessary to prevent the level of tax-exempt yields from rising above their prereform level. Calculation of the magnitude of this shift requires specification of both the determinants of tax-exempt yields (new issue coupon rates) and the impact of the tax reforms on each determinant.

Determinants of Relative Yields on Tax-Exempt Securities

The greatest difference between securities issued by the federal government and by state and local governments is the tax treatment of their coupon income: the federal government taxes the income earned on its securities, but not that earned on state and local securities. If municipal and Treasury securities were identical in every other respect, the relationship between coupon rates on par-valued municipals (Rm) and Treasuries (Rt) of maturity j would be given by

$$Rm_j + (1-\tau_g)Gm + \phi m_j \tau_j Rm_j = (1-\tau_j)Rt_j + (1-\tau_j)Gt + \phi t_j \tau_j Rt_j, \qquad (2)$$

where the G's are expected annual rates of capital gains over the investor's holding period, τ_g is the concurrent effective capital gains tax rate, and the ϕ terms reflect expected tax savings from optimally trading bonds (Constantinides and Ingersoll, 1984). The expected gains depend on expected future one-period coupon rates (and other factors), and the expected tax savings parameters vary negatively with transaction costs and positively with the maturity of the securities. For one-period securities, the expected gains and tax savings are zero and the familiar

$$Rm_1/Rt_1 = 1 - \tau_1 \qquad (3)$$

obtains.

Miller (1977) combines two equilibrium conditions to specify τ_1: equality between the expected risk-adjusted after-tax marginal costs of corporate debt $[(1-\tau_c)i]$ and equity (e) and between the after-personal-tax risk-adjusted return on equities $[(1-\tau_e)e]$ and that on municipal securities $[(1-\tau_1)i]$. Solving,

$$\tau_1 = 1-(1-\tau_c)(1-\tau_e).$$

That is, the tax rate implicit in one-period tax-exempt coupons equals unity less the product of one less the statutory corporate federal tax rate and one less the tax rate on corporate equity.[3] With a corporate tax rate of 0.46 and an equity tax rate of 0.0742, $\tau = 0.5$, and the rate ratio is also 0.5. Allowing for the excess of contracting costs on corporate debt over equity would raise this ratio during periods of substantial risk of corporate bankruptcy.[4]

In recent years, this ratio has been slightly above 0.5 for one-year bonds, roughly 0.7 for ten-year securities, and 0.8 for twenty-year securities (Peek and Wilcox, 1985). For one-year bonds, the ratio has been consistent with equation (3). For longer term bonds, the rate ratio is, from (2),

$$\frac{Rm_j}{Rt_j} = \frac{1-\tau_j+\phi t_j \tau_j}{1+\phi m_j \tau_j} + \frac{(1-\tau_g)(Gt-Gm)}{1+\phi m_j \tau_j}. \qquad (4)$$

An important question is whether tax savings from trading are sufficient in magnitude to reconcile observed rate ratios for longer term bonds with Miller's specification of τ_1 at roughly 0.5 under current law. (On average, the second term in (3) is small and thus can be ignored.)

Constantinides and Ingersoll calculate ϕt_j for 10 year securities to be about 0.5, assuming no transaction costs. With $\tau_j = 0.5$, the first term in (1') becomes 0.75/1.25 = 0.6, assuming ϕm_j is also 0.5. Taking transaction costs into account would lower the ϕ's, especially that for municipal securities. Constantinides and Ingersoll compute a 20 percent reduction in the value of trading ten-year Treasuries if transaction costs equal ½ percentage point and roughly twice this reduction if costs are a full percentage point.

Because quoted bid/ask spreads on Treasury securities are only a quarter percentage point, transaction costs are relatively unimportant for long-term Treasuries. In contrast, quoted bid-ask spreads are 3 to 4 percentage points for municipal securities and would greatly reduce the gains from trading them. With $\phi t_j = 0.45$ for Treasuries and $\phi m_j = 0.1$ for municipals, the first term in (1') becomes 0.7.[5] Thus, the observed increase in the tax-exempt/taxable rate ratio as maturity increases can be explained without varying τ_j across maturities.

Tax Reform and the Ratio of Exempt to Taxable Coupons

The first two columns of Table 1 list the corporate tax rate and the personal tax rate on equity under current law and the reforms. All the reforms would significantly lower the corporate rate and thus raise the ratio of tax exempt to taxable coupons. Moreover, under the original Treasury plan, only the real component of interest would be deductible. More specifically, only β of nominal interest would be deductible, where $\beta = .06/(.06 + \pi)$ and π is the inflation rate. At a five percent inflation rate, the tax saving from a dollar of interest would be only 19 cents -- 0.35(6/11). Because the tax rate at which corporate interest expense is deductible is relevant to the determination of τ_1, Treasury I would surely increase the interest-rate ratio more than the other three reforms.

The equations used to project the rate ratios for one- and ten-year securities under current law and all reforms are:

$$Rm_1/Rt_1 = 1 - \tau_1$$

$$Rm_{10}/Rt_{10} = \frac{1-\tau_1 + 0.45\tau_{1t}}{1+0.1\tau_{1t}}.$$

where $\tau_l = 1-(1-\beta\tau_c)(1-\tau_e)$ and $\beta = 1.0$ except in the original Treasury plan. The tax rate upon which trading gains are based (τ_{lt}) is specified similarly, but with $\beta = 1$ even under Treasury I. The calculated rate ratios for one- and ten-year maturities are listed in the fourth and fifth columns of Table 1. The ratios rise under all reforms, especially the original Treasury plan.

The final task is determination of the magnitude of the downward shift in the domestic supply schedule drawn in Figure 3. This magnitude is computed as the difference between the current assumed level of taxable rates, 0.11, and the average of the levels of taxable interest rates at which savers would earn the same returns on one- and ten-year tax-exempts under the various reforms that they earn under current law. These levels are calculated from

$$Rt^r = Rt^c \left(\frac{Rm}{Rt}\right)^c \Big/ \left(\frac{Rm}{Rt}\right)^r,$$

where the r and c superscripts, respectively, denote values under a reform and current law, and are listed in columns six and seven of Table 1.[6] The differences between 0.11 and the average of these levels are substantial: nearly three percentage points for Treasury I and about one and a half points for the other three reforms.

C. Tax Reform and the Demand for Real Capital

I now turn to the demand side. The question investigated is: how far would interest rates have to fall in response to the different reforms to maintain aggregate investment at current levels (how far would the demand schedule in Figure 3 shift downward)? A detailed listing in Table 2 of the provisions of the reforms pertinent to investment is the starting point.

All reforms lower the maximum corporate and personal tax rates and eliminate the investment tax credit. Proposed capital gains taxation and tax depreciation changes vary widely, however. Bradley-Gephardt treats these items

less favorably than current law: capital gains would be taxed at the regular income tax rate which translates into a 30 percent rate vis-a-vis the current 20 percent, and tax depreciation lives would be lengthened significantly, 40 years for structures rather than the current 18 and 10 years for equipment rather than the current 5. Even with greater acceleration (250%DB versus 175%DB), first-year tax deductions for structures would decline from 10 percent to 6 percent and for equipment the decline would be from 30 to 25 percent. Kemp-Kasten would treat capital gains and tax depreciation far more generously than either current law or the other proposals. On capital gains, a choice would exist between having nominal gains taxed at 60% of the lowered regular rate or having only real gains taxed at regular rates. Moreover, property investments could be effectively written off entirely in the year of purchase. Nonfinancial neutrality would then exist for depreciable properties because net (of depreciation) investment hurdle rates would equal the weighted average cost of capital for all such assets (with $k = 0$ and $z = 1$ in equation (1), $c = r+d$).

Treasury I attempts to neutralize the tax system for inflation by indexing everything. Only real capital gains, including those on inventories, would be taxed, depreciation would be on a replacement, rather than historic, cost basis, and only the real part of interest expense would be taxed and could be deducted (nominal home mortgage interest being the exception). Treasury I also attempts to tax all assets and business forms (except owner-occupied housing) equally. To this end, tax depreciation for each depreciable asset would equal the Treasury's best estimate of true economic depreciation, the investment tax credit would be dropped, real capital gains would be taxed at the regular income tax rate, and half of corporate dividends would be deductible at the corporate level. The indexation of inventory gains, elimination of the tax credit, and the proposed tax depreciation treatment would result in all net investment hurdle rates, except that for owner-occupied

housing, equalling the cost of capital divided by 1 less the relevant tax rate (with k = 0 and z = d/(r+d) in equation (1), c = r/(1-τ) +d). The partial dividend exclusion would reduce discrepancies between the cost of capital for corporate and noncorporate investments.

Treasury II retreats from these principles in significant respects: all interest would continue to be deductible, investors in nondepreciable assets would have the option of paying taxes on nominal capital gains at one-half of the regular income tax rate, tax depreciation would exceed economic depreciation, and only one-tenth of dividends would be deductible. Tax depreciation would be especially generous for equipment that continues to be classified as 3 or 5 years and for public utility structures; allowable depreciation would exceed that under current law even at zero inflation. However, much 5-year equipment would be reclassified as longer lived. For industrial structures, tax depreciation would be more favorable only at inflation rates of 6 percent or greater.

To get a rough fix on how much the reforms would tend to lower interest rates through their negative impact on the demand for capital, I have calculated how the interest rate would have to change for investment hurdle rates, and thus the level of investment in each asset category, to remain constant.[7] The results are listed in Table 3. An interest rate below 11 percent means that the reform is negative for that asset category <u>if interest rates don't change</u>; a rate above 11 percent means the opposite.

All assets except noncorporate inventories receive less favorable treatment under Bradley-Gephardt, with equipment suffering the most followed by utilities (both lose the investment tax credit). This is not the case with Kemp-Kasten. While equipment is hit (much less than under Bradley-Gephardt), structures are favored. The pattern of interest rates implied by Treasury I looks much like that of Bradley-Gephardt, but the levels are even lower (except

for owner-occupied housing). Treasury II gives back much that Treasury I took away. Depreciation allowances are more generous than current law for equipment and utilities to offset partially the removal of the investment tax credit, and deletion of the interest indexation provision vastly dampens the negative effect of Treasury I on highly leveraged depreciable real estate.

To determine the single interest rate that would maintain investment in the aggregate, a simulation model was constructed (Hendershott, 1985). The model contains seven types of nonresidential capital, rental housing and owner-occupied housing. Households in six income classes with endogenous tenure choices are considered. The model allocates a given capital stock among the various capital components based upon the investment hurdle rates for the capital components, the price elasticities of demand with respect to the hurdle rates, and the elasticities of homeownership with respect to the cost of owning versus renting. The interest rate adjusts in response to tax changes so as to maintain the aggregate demand for capital at its initial level. As can be seen in the bottom row of the table, the rate declines are roughly three percentage points with Treasury I, two points with Bradley-Gephardt, one point with Treasury II and no decline with Kemp-Kasten.

D. Reform-Induced Changes in Interest Rates

The first two columns of Table 4 reproduce, for each reform, the interest rates provided by simulations of the capital allocation model and by calculations of the taxable rates that would freeze average tax-exempt coupons at their prereform level. As can be seen, the interest rates produced by the two methods differ by less than a quarter point for Bradley-Gephardt and Treasury I and only about a half point for Treasury I. These calculations indicate that the demand and domestic supply schedules in Figure 3 would drop about equally except in the Kemp-Kasten case. With Kemp-Kasten, the demand for

capital does not decline, owing to provision of substantial investment incentives. However, marginal tax rates fall significantly, so that the supply schedule shifts downward.

The third column is my best estimate of the impact of the various reforms on the level of taxable interest rates. The low end of the range is roughly an average of the first two columns; the high end allows for an offsetting influence of declines in net foreign saving. The rate declines (mid-point) range from a half percentage point with Kemp-Kasten to two and a half points with Treasury I. The fourth and fifth columns contain my best estimate of the impacts on one- and ten-year tax-exempt coupons. These are obtained as the product of the taxable rate in column 3 and the rate ratio listed in Table 1.[8] Under Kemp-Kasten, short-term exempt rates are expected to rise by about a percentage point and long rates are unchanged. Under the other reforms, the increase in short-term rates is only a half percentage point, and long-term rates decline slightly.

II. Financial Flows

The structure of financial flows would be altered by tax reforms in three ways. First, the composition of the underlying real capital stock and net investment flows could be changed; types of security issues are that tend to mirror specific investment outlays would be affected correspondingly. Second, basic financing patterns could be reshaped, owing either to tax-reform induced desired changes or to prohibitions against financing investment in specific ways (most notably by tax-exempt issues). Third, to the extent that the various reforms would improve or reduce the competitive position of particular institutions, the level and form of financial intermediation would be affected. Treasury I would have far and away the greatest impact on financial flows of

the four reforms, largely because of its interest indexation provision. Recognizing this, the discussion treats Treasury I separately from the other reforms.

A. Treasury I

Table 5 contains simulated estimates of the impacts of the four reforms on the distribution of the capital stock among owner-occupied housing, depreciable real estate (residential and commercial), and other structures (industrial and utility) and equipment.[9] As can be seen, Treasury I would have an enormous impact on this distribution. Owner-occupied housing, fueled by a 15 percent increase in the homeownership rate (8 percentage points), would increase by 28 percent: depreciable real estate would decline by 21 percent (most being due to the decline in renting); and equipment and corporate structures would fall by 10 percent. This startling impact follows from the indexation of interest income and expense, except for home mortgage deductions. In a world of five percent inflation, the indexation would lead to a sharp reduction in interest rates. That home mortgage interest would still be fully deductible would trigger a marked shift toward homeownership and a general increase in the demand for housing services by owners.

The real-capital shifts of Treasury I imply a sharp increase in home mortgage issues and declines in other mortgage and bond issues and in business loans. The impact of these real-capital shifts would be reinforced by changes in household and corporate loan-to-value ratios. Households would have a strong incentive to arbitrage the differential indexation -- to borrow more fully-deductible mortgage funds than they would under current law and invest the overage in partially-taxed debt assets. In contrast, corporate loan-to-value ratios should decline in response to the reduction in the tax advantages of debt caused by both interest indexation and the deductibility of half of

corporate dividends. Issues of home mortgages would be further stimulated by the restriction against issues of single-family tax-exempt mortgage revenue bonds which averaged 10 billion in 1982 and 1983.[10] With a 28 percent increase in owner-occupied housing flows and a 30 percent increase in the loan-to-value ratio, home mortgage issues would be two-thirds greater in the new "steady-state" than under current law. During the transition to this state, issues would more than double.

The percentage reduction in issues of other mortgages, taxable bonds and business loans would be less than the percentage increase in home mortgages because the decline in the underlying real capital is expected to be smaller and because restrictions on tax-exempt financing of these activities would significantly increase taxable issues. Tax-exempt multifamily rental housing bonds, private nonprofit hospital and education bonds, student loan bonds and industrial development bonds aggregated over $40 billion in 1983. This was fully a third of taxable business net debt issues in 1983 (only about a sixth in 1984). As a result, declines in taxable issues in the steady state of only 10 to 20 percent should be expected. In contrast, long-term tax-exempt issues would likely be halved; the nongovernmental tax-exempt bond issues that the reform proposal would sharply curtail constituted 61 percent of 1983 long-term tax-exempt issues.

Treasury I's interest indexation feature would also have a notable impact on financial intermediation. A single example serves to illustrate the point. Consider a depository intermediary that invests solely in taxable instruments earning i (net of expected issues) and finances γ of this with deposits paying d and the remaining $1-\gamma$ with equity. The after-tax income per dollar of assets is

$$\text{After-Tax Income} = (1-\beta\tau)i - (1-\beta\tau)\gamma d - (1-\tau)o,$$

where τ is the relevant marginal tax rate, β is the fraction of interest taxed and deducted (currently β=1), and o is the ratio of "net other expenses" to assets. Let i= 0.12, d= 0.10, o= 0.02, τ= 0.3, and γ= 0.95, numbers roughly consistent with current data. Then

$$\text{After-Tax Income} = .7(.12-.095-.02) = .0035.$$

With indexation and an inflation rate of 0.05, β = 0.545 and

$$\text{After-Tax Income} = .82(.12-.095) - .7(.02) = .0069.$$

Under these circumstances, the intermediary's profit rate would double. The increase in profitability would lead to relatively higher deposit (and lower loan) rates and greater financial intermediation.[11]

B. The Other Reforms

I turn now to the other three reforms, looking first at the data in Table 5 on the real capital stock effects. Bradley-Gephardt would generally be favorable for real estate and unfavorable for other forms of capital. This follows directly from the removal of the investment tax credit for equipment and utility structures. Kemp-Kasten and Treasury II would have nearly identical effects at this level of aggregation. Because these plans partially offset the removal of the ITC with more favorable depreciation allowances, the negative impact on nonreal estate assets is negligible. The declines in owner-occupied housing reflect a 5 percent decrease in the home ownership rate.

All three reform proposals include the same general restrictions on tax-exempt financing as Treasury I; thus net tax exempt issues would be roughly halved. Multifamily and commercial mortgages issues would tend to increase under all three reforms, due to both the increase in real capital and the shift from tax-exempt to taxable financing.

The restriction on issues of tax-exempt single-family housing bonds would increase regular home mortgage issues, roughly offsetting the declines under Kemp-Kasten and Treasury II caused by slight decreases in owner-occupied housing. Home mortgage issues would tend to rise under Bradley-Gephardt due to both the increase in housing and the shift out of the exempt market. Nevertheless, a decline in home issues should be anticipated. Like the Treasury plans, Bradley-Gephardt has three personal tax brackets, 0.14, 0.26 (income above $40,000) and 0.30 (income above $65,000). While interest earned by high-income households would be taxed at the higher marginal rates, mortgage interest expense would be deductible at only the base 0.14 rate. This should stimulate considerably greater owner-equity financing of owner-occupied housing, which would tend to reduce the demand for deposits as well as the supply of mortgage securities.

III. Tax Reform and Stock Prices

Equities are largely claims on real capital or, more precisely, the net cash flows generated by the capital for the shareholders, and the market value of equities should equal the risk-adjusted present value of these cash flows (Downs, 1985). To determine the impact of tax changes, then, requires analysis of how the changes would be expected to alter both expected net corporate cash flows and the rate at which they are discounted to obtain market values. A first step in this analysis is specification of the expected cash flows and

market valuation under current law. The second step deals with the reforms. The analysis is for nonfinancial corporations only; the methodology employed is not readily applicable to financial corporations.

The analysis computes "cash-out intrinsic values" (Brainard, Shoven and Weiss, 1980). That is, tax reforms are presumed to affect the value of the returns on existing capital only. To the extent that future investments are expected to earn economic rents (investments in the past 15 years to not appear to have earned any), the corporate tax rate cuts in all reform proposals would increase the expected after-tax rents and thus stock prices. Also, the calculations do not allow for an increase in the value of land, although the possibility of such increases is discussed briefly. The projected stock market increases, then, might be interpreted as conservative estimates.

A. The Value of Shareholder's Claims to Existing Capital

Under current law the sum of the after-tax cash flows from each component (equipment and structures) of the existing fixed capital in period t, K_t, can be written as

$$CF_t = (1-\tau)NOI_t + \tau TAXD_t - (1-\tau)INT_t + \Delta DEBT_t, \qquad (5)$$

where NOI is net operating income, INT is interest paid, TAXD is allowable tax depreciation, and ΔDEBT is the change in outstanding debt financing fixed capital. If firms finance a constant fraction, b, of the market value of their fixed capital with debt at rate i, we have

$$(1-\tau)INT_t = (1-\tau)ibq_tK_{t-1} \text{ and} \tag{5a}$$

$$DEBT = b\Delta(q_tK_{t-1}), \tag{5b}$$

where q_t is the ratio of the market value to replacement cost of the existing fixed capital stock.

To understand better what is involved in projecting CF_t, it is useful to express both the tax depreciation term and K_t in terms of the current nominal fixed capital stock, K_o:

$$\tau TAXD_t = \tau\theta_tK_o \text{ and} \tag{5c}$$

$$K_t = \phi_t(1+\pi)^tK_o, \tag{5d}$$

where π is the expected inflation rate. The θ_t are based upon tax depreciation schedules and decline monotonically; if K_o consisted entirely of newly-placed, undepreciated capital, $\Sigma\theta_t = 1.0$. [Because the depreciable base is not indexed under current law, there is no inflation adjustment in (5c).] The ϕ_t measure the portion of the fixed capital stock existing when the reform passes that is projected to still exist t periods later and thus decline monotonically from $\phi_o = 1.0$ to $\phi_N = 0.0$, where N is the remaining service life of the "longest lasting" component of capital in K_o. Estimates of the θ_t and ϕ_t depend on the precise history of K_o: when it was put in place, its original service life, and what depreciation method was chosen.

The NOI's are also obviously related to the underlying fixed capital stock. I express this relation as

$$NOI_t = \rho^*_t K_{t-1}. \qquad (5e)$$

If technology were putty-putty and there were no costs to adjusting the capital stock, ρ^*_t would equal ρ_t, the current rental prices for equipment/structures (plus a little for economic rents). With putty-clay technology and adjustment costs, ρ^*_t is a weighted average of past rental prices where the weights depend on the portion of the current capital stock put into place in past periods. In the simulations, the NOI's stemming from equipment and structures under current law are obtained by setting ρ^*_t equal to ρ_t. This procedure does not lead to implausible current valuation. The impact of the tax reform is computed two ways: with ρ unchanged and with ρ shifted to the value generated by the tax reform. Because the "correct" measure for stock market valuation should lie between these values, the estimated impact of the reform on valuation should be bounded.

The present value of the cash flows produced by each component of the existing fixed capital stock is:

$$PV_o = \sum_{t=1}^{N} \frac{CF_t}{(1+e)^t}, \qquad (6)$$

where e is the nominal after-tax required return on corporate equity. The value this same stock j periods later is simply

$$PV_j = \sum_{t=j+1}^{N} \frac{CF_t}{(1+e)^{t-j}} \quad \text{and} \quad q_j = PV_j/K_j.$$

A portfolio equilibrium condition can be used to relate e to the interest rate, the expected inflation rate, and personal tax parameters. With the real and inflationary equity returns to shareholders taxed at rates τ_{er} and τ_g, respectively, the after-tax returns to shareholders can be written as

$$(1-\tau_{er})(e-\pi) + (1-\tau_g)\pi = R_m + \delta_e, \qquad (7)$$

where R_m is the yield on risk-free tax-exempt securities and δ_e is the risk premium required on investment in corporate equity. Historically, firms have paid a constant share, p, of real earnings out as dividends (Auerbach, 1982). Thus we write

$$\tau_{er} = p\tau_{div} + (1-p)\tau_{cg},$$

where τ_{div} is the tax rate on dividends and τ_{cg} is the tax rate applicable to real increases in share prices and equals τ_g under current law. In general, I assume p = 0.4, δ_e = 0.075, $\tau_{div} = \tau_{imax}/2$ and $\tau_{cg} = (1-excl)\tau_{imax}/4$, where τ_{imax} is the maximum personal tax rate on interest income, excl is the capital gains exclusion, and the divisions by 2 and 4 reflect tax deferral and avoidance activity.

Table 6 represents the values assumed for key parameters under current law and under the tax reform proposals. Two parameters do not vary across the reforms: the loan-to-value ratio of 0.33 and the inflation rate of 0.05. With these parameters and the other assumptions, the present value of the existing fixed capital stock is $934 billion. This number differs little from the rough market value estimate implicit in the Board of Governor's balance sheet accounts (1985). The market value of fixed capital equals the market value of equity plus debt less the market value of assets other than fixed capital. The market value of equity at the end of 1984 was $1639 billion, and

the market values of inventories and land were $754 and $577 billion, respectively. Under the assumption that the market values of debt and financial assets equalled their book values, the market value of the fixed capital stock was $892 billion.

B. Tax Reform and the Value of Shares

Tax reform could affect share values by fostering economic growth, opening new, highly-profitable investment opportunities. Such effects are highly uncertain, however, and our analysis does not attempt to quantify them. Rather, we limit ourselves to deducing the impact of tax reform on the value of flows stemming from the existing fixed capital stock. The market values of land and inventories are presumed to be unaffected by the reforms.

To account fully for the reforms, a model must incorporate all their provisions. The initial Treasury plan proposed indexation of interest expense -- only β of expense could be deducted, where β is negatively related to the inflation rate -- and deductibility of γ of dividend payments, DIV_t. Treasury II continued the dividend deduction, although at a lower rate, dropped interest indexation, and added a recapture provision.

To account for both the indexation of interest under Treasury I, the $1-\tau$ multiplying the INT variable is charged to $1-\beta\tau$. To incorporate the partial dividend exclusion (the deductibility of γ of dividends), the cash flows in (6) are multiplied by $1+\tau\gamma$, where $\tau\gamma$ is the tax saving from the exclusion per dollar of cash flow to be paid out as dividends.[12] To allow for a possible recapture provision, equation (6) is rewritten as

$$PV_o = \sum \frac{(1+\tau\gamma)CF_t}{(1+e)^t} - PVRECAP, \qquad (6')$$

where the last term is the present value of this provision.[13] In this framework, the tax reforms affect the market value of equities by changing the corporate tax rate, τ, by introducing interest indexation (β 1) and/or a partial dividend exclusion (γ), by changing personal tax rates (τ_e), through "general equilibrium channels" (i, e, and ρ^*), and by special features such as and the recapture provision of Treasury II.

The percentage changes in the market value of corporate equities due to reforms are listed in Table 7. The changes are the sum of the impacts of the reforms on the equipment and structure PVs, divided by the $1639 billion yearend 1984 market value of nonfinancial corporations reported by the Federal Reserve. Upper and lower estimates of share-price percentage changes develop from alternative assumptions about effects of the reforms on net operating incomes. Because the investment hurdle rates for plant and equipment are not altered by Treasury II (or, more correctly, the increase for equipment is offset by the decrease from structures), both assumptions generate the same estimate. For Bradley-Gephardt and Treasury I, the upper estimate reflects an increase in the NOI's based on the increase in hurdle rates; for Kemp-Kasten, the lower estimate reflects a decrease in the NOI's owing to a decline in hurdle rates. An additional set of estimates is developed for the Treasury plans to measure the effect of including or excluding the dividend exclusion (and the recapture provision for Treasury II) in the reform plans.

Because all reforms reduce the taxation on existing capital, all would increase stock values. The implied increases are about 10 percent for Bradley-Gephardt and Treasury II, only 5 percent for Kemp-Kasten, and a much larger 20 to 30 percent increase for Treasury I.[14] About half of the latter comes from the 50 percent dividend exclusion; without the exclusion, the impact of Treasury I would not differ much from those of Treasury II and

Bradley-Gephardt. For Treasury II, the small dividend exclusion would raise share values by roughly 3 percent, and the recapture provision would lower them by slightly less.

The data in Table 7 presume no impact of tax reform on land values. The reforms could raise land values significantly, however. Assume, along the lines of Feldstein (1980), that the net of tax return on land equals the real tax-exempt yield plus a risk premium:

$$\frac{(1-\tau_L)F_L}{P_L} - \tau_g\pi = Rm - \pi + \delta_L,$$

where F_L is the marginal product of a unit of land, τ_L is the effective tax rate on real returns to land, P_L is the real price of land and δ_L is the required risk premium on land. If the tax-exempt rate is not changed by the tax reform (an assumption supported for all reforms except Kemp-Kasten by the analysis in Section I), the productivity of capital is unchanged, and minor changes in τ_g are ignored, the percentage change in the real price of land is $\Delta\tau_L/(1-\tau_L)$. If real returns on land were taxed at the full corporate rate, land values would rise by roughly 25 percent, and corporate equities would rise in value by an additional 9 percent because corporate land is currently valued at 35 percent of corporate equity.

IV. Summary

Interest rates are determined by the supply of and demand for funds to finance real capital. Tax reforms such as cuts in marginal corporate and personal tax rates and interest indexation lower interest rates by shifting both the supply and demand curves downward. Reductions in "pure" investment incentives -- in investment tax credits and the generosity of tax depreciation

allowances -- lower the demand curve only. The precise decline in interest rates depends on the magnitude of these curve shifts and of the interest-rate elasticities of investment demand, domestic saving, and net foreign saving.

Shifts in the domestic-supply and demand schedules are calculated for four tax reforms: Bradley-Gephardt (BG), Kemp-Kasten (KK), Treasury I (TI) and Treasury II (TII). On the supply side, the downward shifts are estimated to be roughly three percentage points for Treasury I and about one and a half points for the other three reforms. On the demand side, the downward shifts are roughly three points again for TI, two points for BG, one point for TII and no decline at all for KK. The larger shifts for TI are attributable to its interest indexation feature. The smaller demand shifts for TII and KK (no shift at all) are the result of the more generous tax depreciation allowances, especially under KK, than exist under current law. Taking into account the shifts of both curves and allowing for a dampening effect of net foreign saving, the rate declines from the four plans are roughly two and a half points for TI, one and a half points for BG, one point for TII and a half point for KK. Interest rates will decline with tax reform, but how much depends on how the reform is structured.

Financial flows will be altered by tax reforms to the extent that: (1) the composition of investment, especially between owner-occupied housing, depreciable real estate and nonreal estate assets, is altered, (2) desired loan-to-value ratios are changed, and (3) particular types of issues are specifically limited by the reforms. All reforms would sharply restrict issues of tax-exempts for nongovernmental uses, issues which have constituted sixty percent of total long-term exempt issues in recent years. All reforms except Treasury I would also modestly reduce home mortgages, Treasury II and Kemp-Kasten because of a roughly five percent reduction in the demand for owner-occupied housing and Bradley-Gephardt because of a decrease in the desired

loan-to-value ratio. In contrast, other issues, especially multifamily and commercial mortgages, would increase owing to an increase in depreciable real estate and the restrictions on tax-exempt issues for nongovernmental uses.

Far and away the largest changes in financial flows would occur in response to the interest indexation provision of Treasury I. This provision would sharply lower interest rates and, because home mortgage interest would still be fully deductible, the cost of debt financing owner-occupied housing. The combination of more of this housing and a higher loan-to-value ratio would substantially increase home mortgage issues. Other taxable issues would fall due both to the reallocation of real capital toward housing and to a decrease in business loan-to-value ratios, owing to the reduced deductibility of interest (and the partial deductibility of dividends for corporations). This decline would, however, be mitigated by the shift from tax-exempt financing for nongovernmental purposes to regular taxable financing. Finally, interest indexation would favor growth of financial intermediaries with the greatest excess of interest income over interest expense.

The cut in the corporate income tax rate would raise the after-tax cash flows stemming from the existing capital stock. This and minor changes in the equity discount factor for these cash flows would raise stock prices by roughly five percent under Kemp-Kasten and ten percent under the other three reforms. The fifty percent dividend exclusion of Treasury I would raise stock prices by about another fifteen percent ($250 billion). The smaller ten percent dividend exclusion of Treasury II and its recapture provision about offset each other.

FOOTNOTES

[1]Feldstein and Summers (1978) develop the relationship between investment incentives and before-tax interest rates, and Peek and Wilcox (1984) report evidence that before-tax interest rates respond to tax rates.

[2]Auerbach and Kotlikoff (1983) calculate that the 1981 Tax Act imposed a capital tax of $200 billion on shareholders by taxing new capital more favorably than old; Hendershott and Shilling (1982) calculate that the 1981 Act would raise real interest rates by a percentage point and a half.

[3]One could develop, at least intuitively, a noncorporate structure argument analogous to Miller's corporate structure argument. The result would be identification of τ_1 with "the" personal tax rate on debt. If this rate were taken to be the maximum rate under current law and the tax reforms, the analysis that follows in the text would not be significantly altered because the corporate and maximum personal rates are roughly equal now and would continue to be under all reforms.

[4]Buser and Hess (1985) find the corporate bond risk spread, a proxy for the expected probability of default, to be the major determinant of variation in the one-year rate ratio over the 1967-82 period.

[5]The above analysis assumes that municipal and Treasury securities are equal in all respects other than federal taxation of their coupon income. In fact, coupons on municipal securities must contain a premium to compensate investors for expected shortfalls in realized yields relative to promised yields owing to default and/or early call, and the expected shortfalls on high quality securities tend to increase with maturity (they approximate zero on one-year

securities). Further, the longer the maturity of munis, the more high tax bracket investors must be compensated for the possibility of their unexpectedly becoming lower tax bracket investors (and having to pay large transaction costs to convert to taxable securities) or of the value of municipals' tax-exempt status declining. These factors would raise longer-term exempt coupons relative to longer-term taxable coupons.

[6]The precision of the interest rates reported (basis points) in this and other tables reflects the exactitude of the computer, not the confidence of the author.

[7]This is an application of the methodology used by Feldstein and Summers (1978) in their calculation of the maximum potential interest rate for all corporate investments. Modelling of the reforms is fully described in Hendershott (1985).

[8]The Kemp-Kasten calculation is based upon a rate ratio of 0.730 which would exist if the corporate tax rate were 0.4. The corporate rate is raised from 0.35 because higher tax rates would be necessary to render Kemp-Kasten revenue neutral.

[9]These data are long-run calculations assuming infinite price elasticities of factor supplies. In the short-run, asset prices will be bid up or down, thereby inducing the necessary factor and real capital shifts. (Greater detail by asset category is contained in Hendershott, 1985.)

[10]The data in this paragraph and the next are from The President's Tax Proposals to the Congress for Fairness, Growth and Simplicity, 1985, Table 11.01-1, 284.

[11]Insurance companies would benefit even more than depository institutions from indexation because they have far more interest income than interest expense. However, other provisions of the Treasury proposals would tax these companies more heavily.

[12]While some of the increase in cash flows may be retained and reinvested, the present value of the cash flows will be unaffected if the new investment earns the discount rate, e.

[13]This provision puts 40 percent of the excess depreciation (tax depreciation less the straight line number reported in earnings and profit statements) taken in the 1980-84 period into taxable income in 1986-88 (12 percent each in 1986 and 1987 and 16 percent in 1988).

[14]These results assume that corporations receive full benefit of the decline in interest rates (all debt is short-term or can be costlessly refinanced). In the case of constant NOIs, the after-tax interest saving increases share values by over a percentage point only under Bradley-Gephardt (1½ points) and Treasury I (4 points).

References

Auerbach, A.J. "Issues in the Measurement and Encouragement of Business Saving," in Saving and Goverment Policy, Federal Reserve Bank of Boston, Conference Series No. 25, 1982, 79-100.

Auerbach, A.J. and L.J. Kotlikoff, "Investment Versus Savings Incentives: The Size of the Bang from the Buck and the Potential for Self-Financing Business Tax Cuts, " in The Economic Consequences of Government Deficits, (ed) L.H. Meyers. Boston: Kluwer-Nijhoff Publishing, 1983, 121-154.

Board of Governors of the Federal Reserve System, Balance Sheets for the U.S. Economy, July 1985.

Brainard, W.C., J.B. Shoven and L. Weiss, "The Financial Valuation of the Return to Capital," Brookings Papers on Economic Activity, 2, 1980, 453-502.

Buser, S.A. and P.J. Hess, "Empirical Determinants of the Relative Yields on Taxable and Tax-Exempt Securities," mimeo, August 1985.

Constantinides, G.M. and J.E. Ingersoll, Jr., "Optimal Bond Trading with Personal Taxes," Journal of Financial Economics, 13, September 1984, 299-335.

Downs, T.W., "The Determinants of Market Value," Boston College School of Management, Working Paper 85-35, 1985.

Feldstein, M., "Inflation, Tax Rules and the Prices of Land and Gold," Journal of Public Economics, 14, December 1980, 309-318.

Feldstein, M. and L.H. Summers, "Inflation, Tax Rules and the Long-Term Interest Rate," Brookings Papers on Economic Activity, 1, 1978, 61-99.

Hall, R.E. and D.W. Jorgenson, "Tax Policy and Investment Behavior," American Economic Review, June 1967, 56, 391-414.

Hendershott, P.H., "Tax Reform, Interest Rates and Capital Allocation," NBER Working Paper, August 1985.

Hendershott, P.H., and J.D. Shilling, "The Impacts on Capital Allocation of Some Aspects of the Economic Recovery Tax Act of 1981," Public Finance Quarterly, April 1982, 242-273.

Miller, M., "Debt and Taxes," The Journal of Finance, 32, May 1977, 261-275.

Peek, J. and J.A. Wilcox, "The Degree of Fiscal Illusion in Interest Rates: Some Direct Estimates," American Economic Review, 74, December 1984, 1061-1066.

Peek, J. and J.A. Wilcox, "Tax Rates and Tax-Exempt Interest Rates," New England Economic Review, forthcoming.

Summers, L.H., "Capital Taxation and Accumulation in a Life Cycle Growth Model," American Economic Review, 71, September 1981, 533-544.

Table 1: Tax-Exempt and Taxable Coupon Rates Under Various Tax Regimes

Tax Regime	Corporate Tax Rate	Tax Rate on Equity[a]	Exempt/Taxable Rate Ratio		Taxable Rate That Maintains Exempt Rate	
			One Year	Ten Year	One Year	Ten Year
Current	.46	.0742	.500	.690	.11	.11
Bradley-Gephart	.30	.0940	.634	.770	.0868	.0986
Kemp-Kasten	.35	.0555	.614	.758	.0896	.1001
Treasury I	.35	.1128	.718[b]	.872[b]	.0766	.0870
Treasury II	.35	.0667	.607	.754	.0906	.1007

[a]From Hendershott, 1985, Table 6.

[b]Assumes an inflation rate of 5 percent. The ratio varies positively with the inflation rat because the portion of interest that is taxed varies negatively with the inflation rate.

Table 2: Important Tax Parameters for Business Investment

	Current Law	Bradley-Gephardt	Kemp-Kasten	Treasury I	Treasury II
Maximum Tax Rates[a]					
Corporate	.4924	.342	.389	.37	.37
Personal	.53	.342	.30	.41	.41
Investment Tax Credit	yes	no	no	no	no
Capital Gains	Nominal gains at 40% of regular rate	Nominal gains at regular rate	Nominal gains at 60% of regular rate or real gains at regular rate	Real gains at regular rate	Nominal gains at 50% of regular rate or real gains at regular rate
Depreciation Tax Deductions[b]	175%/150% DB or SL over 18/5 years	250% DB over 40/10 years	Near Expensing[c]	3% per year, SL, indexed	DB/SL over 28/6.5 years indexed
First year:					
Structures	10%	6%	6%	3%	4%
Equipment	30%	25%	20%	18%	27%
Interest Indexation	no	no	no	yes	no
Partial Dividend Exclusion	no	no	no	yes(50%)	yes(10%)

[a]These assume a six percent state and local tax rate, deductible at the personal level except under the Treasury plans.

[b]All tax reforms have multiple maturity equipment classes. The first (full) years depreciation rates are for an "average" piece of equipment and for a current 18 year structure.

[c]More than 100 percent, indexed for inflation, of the original value is written off at straight line rate over 25 years. With a low 3½ percent real discount rate, this is equivalent to expensing.

Table 3: Interest Rate Levels Necessary to Maintain Investment in Different Assets Assuming Passage of Different Reform Plans (prepassage level of interest rates = 11%)

	Bradley-Gephardt	Kemp-Kasten	Treasury I	Treasury II
Corporate				
Inventories	10.4	11.1	9.9	12.7
Equipment	5.9	9.0	5.1	7.8
Industrial Structures	10.4	12.9	8.2	11.2
Utility Structures	8.5	11.1	7.1	11.1
Noncorporate				
Inventories	11.0	11.6	10.5	12.9
Equipment	6.2	8.8	5.3	7.7
Depreciable Real Estate	9.6	11.5	7.8	10.06
Owner-Occupied Housing[a]	9.5	10.9	9.7	10.0
Model Simulation	9.11	11.06	8.00	10.12

[a]This is a weighted average for households with incomes of $17,500, $27,500, $40,000, $70,000 and $130,000, where the weights are 0.12, 0.10, 0.31, 0.30, and 0.17.

Table 4: Interest Rates Under Alternative Tax Regimes (%)

	Taxable Rate Implied by Fixed Capital Stock Model	Taxable Rate That Would Maintain Average Exempt Rates	Best Estimate of 10-Year Taxable Rate	Best Estimates of Tax-Exempt Rates	
				1-Year	10-Year
Current Law			11	5.5	7.7
Bradley-Gephardt	9.11	9.27	9.25 to 9.75	6.0	7.3
Kemp-Kasten	11.06	9.49	10.25 to 10.75	6.4	7.7
Treasury I	8.00	8.18	8 to 9	6.1	7.4
Treasury II	10.12	9.56	9.75 to 10.25	6.1	7.5

Table 5: Impacts of Reforms on the Distribution of the American Capital Stock (% change)

	Treasury I	Bradley-Gephardt	Treasury II	Kemp-Kasten
Owner-Occupied Housing	28	4	-3	-4
Depreciable Real Estate	-21	4	6	7
Equipment and Other Structures	-10	-5	-2	-1

Table 6: Parameter Values for Stock Market Calculations

	Current Law	Treasury I	Treasury II	Bradley-Gephardt	Kemp-Kasten
Fraction of Interest Deductible (β)	1.0	0.545[a]	1.0	1.0	1.0
Fraction of Dividends Deductible (γ)	0.0	0.5	0.1	0.0	0.0
Profits Tax Rate (τ)[b]	.4924	.37	.37	.342	.389
Interest Rate (i)	.11	.085	.10	.095	.105
Equity Rate (e)	.1687	.1704	.1649	.1685	.1662
Hurdle Rate for Equipment (ρ_E)[c]	.2260	.2733	.2468	.2621	.2424
Hurdle Rate for Structures (ρ_S)[c]	.1542	.1586	.1405	.1440	.1302

[a]Assumes a 5 percent inflation rate.

[b]Incorporates a 6 percent state and local tax rate deductible at the Federal level.

[c]These data are computed in Hendershott (1985).

Table 7: Impact of Tax Reforms on Share Values (%)

	All Reform Provisions	Without Dividend Exclusion and Recapture
Bradley-Gephardt	10-13	
Kemp-Kasten	4-7	
Treasury I	20-30	8-16
Treasury II	10	9

FIGURE 1

Interest Rate Determination: Zero Interest Rate Elasticity for the Supply of Capital

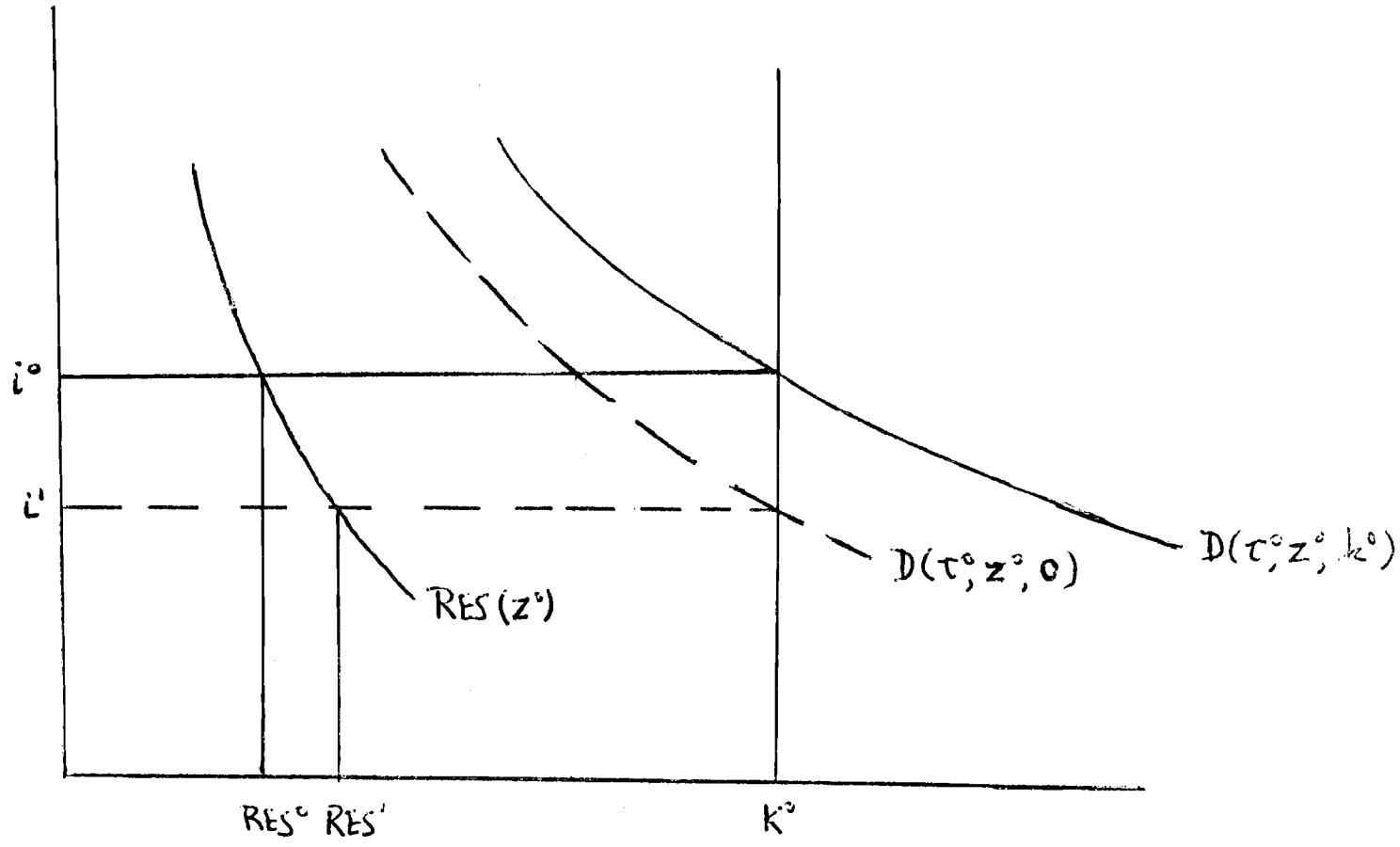

FIGURE 2

Interest Rate Determination: Infinite Interest Rate Elasticity for the Supply of Capital

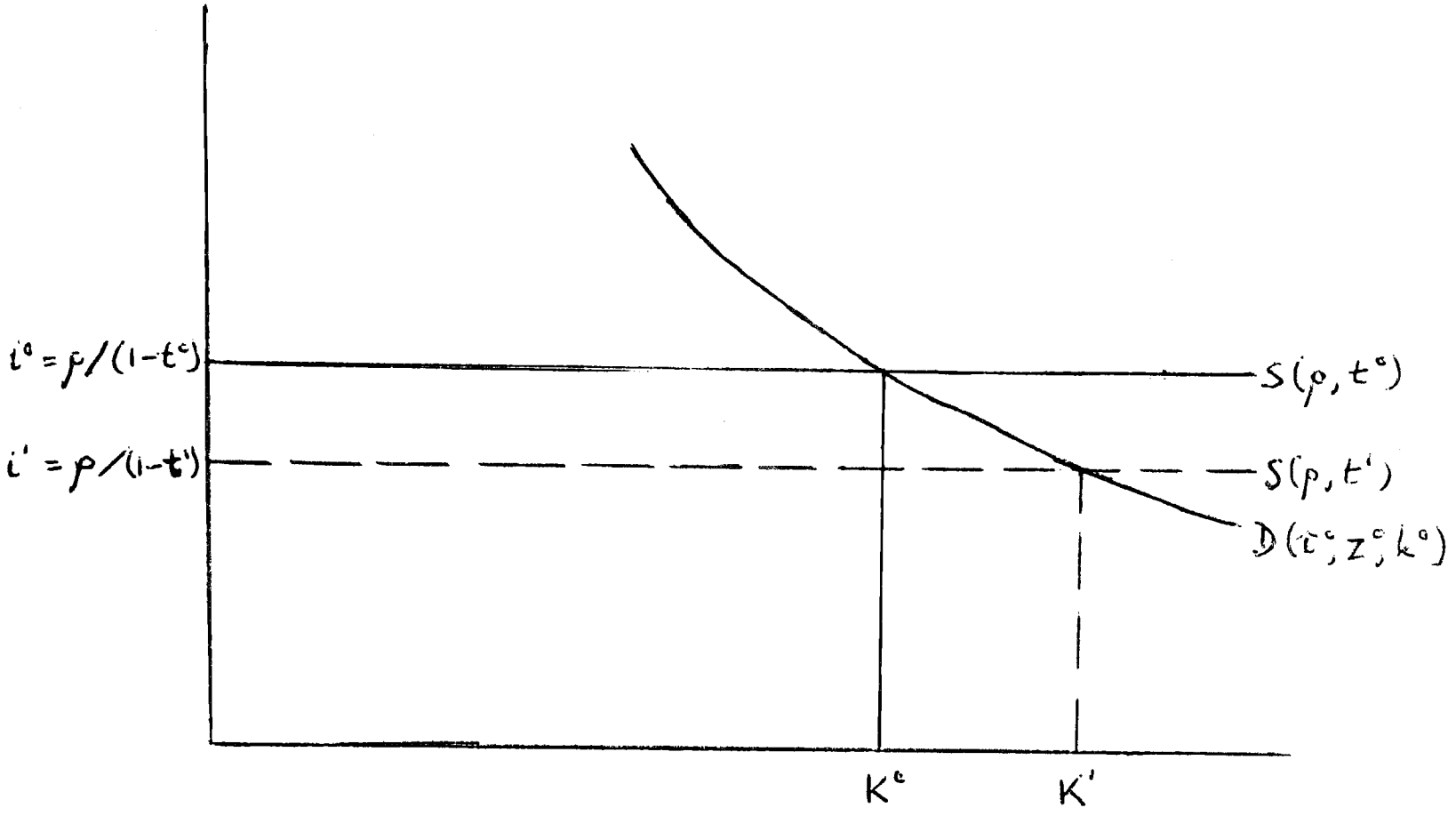

FIGURE 3

Interest Rate Determination: Finite Interest Rate Elasticity for the Supply of Capital