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TAX REFORM AND THE SLOPE
OF THE PLAYING FIELD

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ABSTRACT

Possible benefits of tax reform include faster economic growth and greater equity across households. A part of economic growth is the channeling of saving into the most productive real investments. The ability of various tax regimes to channel saving efficiently and independently of the inflation rate is the focus of the current paper. The tax regimes include current law, preERTA law, the Treasury and Administration reform proposals, HR 3838, and what seems likely to come out of the Senate Finance Committee.

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One goal of tax policy is an efficient allocation of resources. From the perspective of real capital, efficiency translates into the familiar "level playing field" upon which different forms of capital investment would compete on equal terms. A relevant question, then, is: will the changes in tax rates and tax incentives embodied in the Treasury, Administration and House (HR 3838) reform plans render the field more level? Because the slope of the playing field under current law also depends on the level of inflation, a related question is: will this slope's sensitivity to inflation be dampened or exaggerated by the reforms? Providing answers to these questions is the purpose of this paper. Along the way, I also take a brief look backward at the impact of early 1980 tax changes and forward at the impact of the bill likely to emerge from the Senate Finance Committee.

My analysis of the various tax reforms plans suggests that only the Administration plan would create a more level playing field (a full version of this analysis is contained in Hendershott, 1986). Both the Treasury plan and the House bill would tilt the existing field toward owner-occupied housing, the investment that is already most tax favored. In effect, we would return to the pre-1981 world. The Administration plan, and the House bill to a lesser extent, would also significantly reduce the sensitivity of the playing field to inflation. The Treasury plan, in contrast, would increase the sensitivity, in spite of its professed intent to do otherwise.

THE ANNUAL RENTAL COST AND THE EFFICIENT ALLOCATION OF CAPITAL

A key determinant of investment in any type of capital good is its annual rental cost. If the gross return from investment promises to exceed this cost, then investment will occur. Because additional investment drives down the gross return, eventually an equilibrium will be reached at which the gross return from new investment equals the rental cost. Moreover, the higher is the rental cost for any capital good, the higher will be the required gross return and thus the less will be investment in the good in equilibrium.

In a world devoid of taxes and tax incentives, the annual rental cost or investment hurdle rate is simply the real interest rate, including the risk premium relevant to the asset, plus economic depreciation. The higher is the risk premium an asset must promise and the greater is its anticipated rate of depreciation, the higher is the hurdle rate and thus the required gross return. But this is only appropriate: assets that are riskier and wear out faster should promise greater returns to compensate for their greater risk and more rapid deterioration. The zero tax and tax-incentive world would yield a level playing field, i.e., one in which the risk-adjusted net (of depreciation) rental costs for all investments are equal.

Our actual world contains numerous taxes and tax incentives. The "effective tax rates" for alternative investments, plus differences in the financing and riskiness of the investments, tilt the playing field in various directions. The tilts, in turn, cause overinvestment in some capital goods and underinvestment in others. The result is a lower average return on capital than would exist with the optimal allocation of capital and a reduction in the national standard of living. The reduction is labeled an efficiency loss.

THE PLAYING FIELD UNDER CURRENT LAW

The risk-adjusted net rental costs for seven capital classes are listed in Table 1 for five tax regimes: current law, the November 1984 Treasury plan, the May 1985 Administration plan, HR 3838 passed in December 1985 and the "Senate Finance Committee Bill". There are four corporate asset classes

--PLACE TABLE 1 HERE--

(inventories, equipment, public utility structures and industrial structures) and three noncorporate real estate assets (depreciable rental and commercial structures, owner-occupied housing of households with adjusted gross incomes under 50,000 1985 dollars, and owner-occupied housing of households with incomes over \$50,000). Two noncorporate equipment categories are also included for the Senate Bill. The calculations for current law assume a five percent inflation rate and a ten percent debt rate and have been adjusted to the presumed risk of owner-occupied housing. Other important assumptions are noted below.

As can be seen, the adjusted net rental costs or investment hurdle rates vary widely across corporate assets under current law, with inventories having the highest and utilities and, especially, equipment the lowest. The differences are easily explained. Inventories are subject to a special inflation tax, owing to FIFO accounting, and utilities and equipment benefit from a special tax break, the investment tax credit. Because a given percentage credit is more beneficial the shorter the life of the asset, the credit lowers the cost for equipment more than the cost for utilities.

The hurdle rate for depreciable real estate structures is far less than that for corporate industrial structures. In addition to the double-taxation of corporate income, the difference reflects discrimination in the current system against riskier, more equity financed investments and the lower risk and greater debt associated with real estate investments.¹ More specifically, the

calculations are based on a one-third debt-to-value ratio and a 5 percent risk premium for corporate investments versus a two-thirds debt-to-value ratio and 2½ percent risk premium for depreciable real estate.

The hurdle rates for owner-occupied housing are the lowest, reflecting the absence of taxation of the returns from this asset. (These calculations are independent of the assumed risk premium and, under current law, are largely independent of the assumed loan-to-value ratio.) The advantage of the nontaxation is, of course, greater the higher the tax bracket of the homeowner. For simplicity, owners have been divided into only two classes, those with incomes above and below \$50,000. The hurdle rates for these classes are rough weighted averages of owners within each of these classes, the weights depending on the relative quantities of housing the owners demand.

A comparison of the risk-adjusted net costs under current law suggests two ways to produce a more level playing field. First, the general advantage of real estate, especially owner-occupied housing of higher income households, can be lessened. (While a plausible case can be made for tax incentives to encourage homeownership, a persuasive case for subsidizing owners to occupy larger houses has not been made.) Second, the disparity of costs across corporate assets can be reduced. In the context of the first way, this largely means lowering the costs of other corporate assets to that of equipment, not raising the latter to the former; the often-noted bias in favor of equipment under current law, while large relative to other corporate investments, is small relative to capital investments generally.

THE TREASURY, ADMINISTRATION AND HOUSE TAX REFORMS

Proposed tax reforms generally treat capital income less favorably than does current law: the investment tax credit is dropped in all proposals, depreciation allowances are less generous in most cases, and the tax rate at

which real estate expenses are deductible would decline under every reform. As a result, aggregate investment demand would fall if the existing level of interest rates continued. I have constructed a model in which the interest rate declines just enough to maintain aggregate investment demand. This interest rate level is shown at the bottom of Table 1, and the adjusted net rental costs listed in the Table for the various reforms are based upon the new lower level. This procedure makes the general level of adjusted net costs in any column comparable to that in any other column. If the costs were computed with the initial 10 percent level of interest rates, all the numbers in each column would be increased, the increase being larger the further 10 percent is above the interest rate in the bottom row. However, the relationship between the numbers in any column -- the slope of the playing field -- would change little for the Administration and House reforms, and the differences across the numbers for the Treasury plan would be even greater.

The Treasury plan 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 (except all mortgage interest on one's principal residence would remain deductible). The Treasury plan 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. As the data in Table 1 show, the indexation of inventory gains, the removal of the

tax credit, and the proposed tax depreciation treatment would vastly narrow the risk-adjusted net costs across corporate assets. Also the partial dividend exclusion would reduce the double taxation of corporate investments.

While the Treasury plan scores high in reducing the disparities across corporate investments -- and in reducing the disparities across industries within the corporate sector, although I do not illustrate this point here -- the plan fails to reduce the advantages of real estate. In fact, the relative advantage of owner-occupied housing rises by nearly a quarter. Under current law the difference between the average net costs for corporate and owner-housing capital is about 4 percentage points (0.067-0.026); with the Treasury plan the difference rises to 5¼ points (0.069-0.016). Because owner-occupied housing is currently the most tax-favored asset, the added efficiency loss from enlarging this bias swamps the efficiency gain from better allocation across corporate assets.²

The Administration plan retreats from the general principles of the Treasury plan 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; only one-tenth of dividends would be deductible; and, in order to make the plan revenue neutral, inventory gains would continue to be nonindexed. 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, most 5-year equipment would be reclassified as 6,7 and even 10 year equipment. As a result, biases against inventories and in favor of equipment would remain, although at much reduced levels. Moreover, the Administration plan would reduce the general bias

against corporate investments and in favor of owner-occupied housing, especially that of higher income households. Overall, a more level playing field and efficient allocation of capital would result.

The House bill removes the investment tax credit and substantially lengthens depreciation schedules for structures. The resulting impact on adjusted net rental costs would be remarkably similar to that of the Treasury plan. Moreover, because far less base broadening would occur than under the Treasury and Administration plans (most importantly, state and local taxes would continue to be fully deductible), marginal tax rates for most homeowners with incomes between \$40,000 and \$90,000 would not decline relative to current law (Hendershott and Ling 1986) and thus neither would the absolute advantage of owner-occupied housing. The disparity among corporate net rental costs would narrow sharply, but these costs would be at a high level, while costs for owner-occupied housing would decline from their already low levels. Again a generally less level field and less efficient allocation of capital would result.

THE SENATE FINANCE COMMITTEE

At this point (mid April), the final version of the Committee bill is far from certain. In these calculations I have assumed the original "Packwood" investment incentives: ACRS depreciation schedules (with 3 percent indexation -- 5 percent inflation less the 2 percent threshold), 30 year straight-line depreciation for structures, and no investment tax credit. To account for the higher \$50,000 expensing provision for equipment, two additional capital categories have been included in Table 1; both are noncorporate equipment, one with five-year ACRS depreciation and the other with complete expensing.

For owner-occupied housing, two alternatives are analyzed. The first assumes that tax revenues are increased by raising some excise taxes and eliminating the deductibility of excise taxes and tariffs. With this revenue, a significant reduction in marginal household tax rates is possible; the reduction is assumed to be the same as that generated in the Administration plan. In the second, no additional tax revenues from excise taxes and tariffs are assumed and thus no significant rate reduction is possible; the marginal household tax rates here are taken to be the same as those in the House bill.

The difference between my Administration and House variants of the Senate Finance Committee bill is clear; the sharply higher marginal tax rates for owners in the \$50,000 to \$100,000 income range under the House bill increases the tax advantage to owner-occupied housing and thus lowers its net rental cost. In contrast, the costs for capital other than owner-occupied housing rise slightly. It is also useful to compare the Senate Finance Committee variants with their pure Administration/House counterparts. Relative to the Administration plan, the Senate variant is less favorable to structures, including depreciable real estate, and public utilities and more favorable to owner-occupied housing. Relative to the House bill, the other Senate variant is also less favorable to structures, but it is more favorable to equipment and public utilities (offsetting some of the impact of the removal of the investment tax credit) and less favorable to owner-occupied housing.

WHAT ERTA/TEFRA WROUGHT

The Economic Recovery Tax Act of 1981 roughly halved depreciation tax lives. Together with the existing investment tax credit, this created negative effective tax rates for equipment, although the 1982 Act, which reduced the depreciable base for equipment by one-half the investment tax credit (and reneged on promised more accelerated depreciation methods in 1985), got the tax

rates back into the positive zone. Because ERTA/TEFRA were so maligned for the biased (toward equipment) playing field they created (see Gravelle 1982, for example), it is perhaps useful to revisit the impact of the early 1980 tax changes.

Table 2 contains risk-adjusted net rental costs both before and after ERTA/TEFRA. The expected long-run inflation rate at the time of enactment is presumed to have been 8 percent and the level of interest rates associated with

-- PLACE TABLE 2 HERE --

that is taken to be 13 percent. Comparing the pre and post ERTA/TEFRA numbers, we do see a marked reduction in the hurdle rate for equipment relative to other corporate investments: $3\frac{1}{2}$ points vis-a-vis inventories, 2 points relative to public utilities and one point more than structures. On the other hand, what had been a large bias in favor of owner-occupied housing was sharply reduced. The "average" gap between hurdle rates on corporate capital and owner-occupied housing was lowered from roughly 6 points (0.07 less 0.01) to about $3\frac{1}{2}$ points (0.06 less 0.025).

ERTA/TEFRA, then, reduced the efficiency of the allocation within the corporate sector but increased the efficiency of allocation between owner-occupied housing and the corporate sector. Given the large bias toward owner-occupied housing prior to ERTA/TEFRA, overall capital would likely be allocated more efficiently post than pre ERTA/TEFRA. The principal deficiency of both the Treasury Plan and the House Bill, from the capital efficiency perspective, is their tendency to reestablish the large bias in favor of owner-occupied housing (compare the net adjusted hurdle rate for owner-occupied housing in Tables 1 and 2).

INFLATION NEUTRALITY

The inflation neutrality of the various tax regimes is examined by computing the changes in the adjusted net rental costs that would occur as inflation rises from zero to ten percent. The model-computed change in the level of interest rates accompanying the 0.10 rise in inflation is listed in the last row of Table 3. Under current law (and the Administration and House reforms), interest rates rise by about 1.4 times the increase in inflation

-- PLACE TABLE 3 HERE --

because nominal, rather than real, interest is taxed and deducted; with the 1.4 increase, the general level of rental costs that evolves maintains aggregate investment. With perfect interest indexation (the taxation and deduction of real interest only), interest rates would rise one-for-one with the increase in inflation. The rate increase is 1.15-for-one under the Treasury plan because two flaws in its indexation feature would continue to allow deduction of part of the inflation premium in interest rates. First, the indexation presumes a 6 percent real interest rate, a level that is probably too high even under current tax law and would certainly be far too high after interest rates declined in response to the adoption of indexation. Second, mortgage interest expense on one's principal residence would continue to be fully deductible under the Treasury plan.

Two sources of bias in current tax law, the advantage of debt and the double-taxation disadvantage of corporate ownership, are aggravated by inflation. Thus inflation favors depreciable real estate and high-income owner-occupied housing, which are heavily debt-financed and not corporate owned, and disfavors heavily equity-financed corporate investments. Lower-income owner housing is also disfavored because the owners deduct interest at a low tax rate and do not have an advantage from debt financing. With a marginal tax rate of 0.2, the real after-tax debt rate rises from $2\frac{1}{2}$ percent at a zero

inflation rate to 4 percent at a ten percent rate. In contrast, with a 0.4 tax rate, the real-after tax rate would decline from 1 and 3/4 percent to 1/2 percent.

Full interest indexation and integration of corporate and personal taxes would eliminate the disadvantages to both equity finance and corporate ownership. Because aggravation of these biases is the source of inflation nonneutrality under current law, one would expect the Treasury plan to be more inflation neutral than current law. Unfortunately, imperfections in the Treasury plan, particularly the exclusion of home mortgage interest expense from the indexation provision, render the plan more inflation sensitive. While the large advantage to depreciable real estate is removed, the advantage to owner-occupied housing is increased. With the much smaller increase in nominal interest rates and the continued full deductibility of interest payments, the real after-tax mortgage rate declines as inflation accelerates, even for owners in the 0.2 tax bracket. The other side of the coin is higher costs for corporate investments. Note, however, that the different types of corporate investment are affected equally (badly) by inflation.

The Administration plan, in contrast, would be more inflation neutral than current law. The two inflation-favored investments under current law, depreciable real estate and owner-occupied housing of high-income households, would be less favored. This follows from the reduction in tax rates which lowers the advantage of debt. With the exception of inventories, which would still be subject to the inflation tax, corporate costs would be quite insensitive to inflation. (This would also be true of inventory costs if revenue-neutrality had not caused the inflation tax to be maintained.)

The House bill, too, would reduce the inflation biases existing in current law, although by less than the Administration plan. Again, the two most inflation-favored investments under current law would be less favored, but

the increase in the cost for high-income owner-occupied housing is limited. The small increase relative to the Administration plan follows from differences in the marginal tax rate at which owners in the \$50,000 to \$100,000 income range would deduct mortgage interest. Under the House bill, this tax rate would rise by 2 percentage points, tending to lower the after-tax mortgage rate; in contrast, this tax rate would decline by $6\frac{1}{2}$ points under the Administration plan.

CONCLUSION

Possible benefits of tax reform include faster economic growth and greater equity. A part of economic growth is the channeling of saving into the most productive real investments. The ability of various tax regimes to channel saving efficiently and independently of the inflation rate has been the focus of the current paper.

On the basis of this single criterion, the May 1985 Administration proposal is superior to current law, the Treasury proposal of November 1984, HR 3838 passed by the U.S. House of Representatives in December 1985, and what seems likely to come out of the Senate Finance Committee. Efficient capital investment requires that the risk-adjusted net (of depreciation) rental costs of all capital goods be equal. The Administration plan would reduce both the disparity of these costs across corporate investments and the gap between the average costs for corporate investments and owner-occupied housing. While the Treasury plan and House bill would narrow the differences in rental costs across corporate assets even more than the Administration plan would, these reforms (and the likely Senate Finance Committee legislation) would greatly increase the bias in favor of owner-occupied housing. In fact, this bias is likely to be as great as it was prior to ERTA. As a result, saving would be allocated even less efficiently under these plans than under current law.

Risk-Adjusted Net Rental Costs
(5 Percent Inflation Rate)

Table 1

	Current Law	Treasury Plan	Administration Plan	House Bill	Senate Finance Committee Adm. House
Corporate Investments					
Inventories	.109	.074	.086	.083	.085 .087
Equipment	.036	.068	.051	.063	.050 .052
Public Utilities	.060	.072	.048	.072	.058 .060
Structures	.075	.073	.064	.070	.072 .074
Depreciable Real Estate	.041	.041	.036	.040	.042 .044
Owner-Occupied Housing					
Under \$50,000 AGI	.035	.020	.035	.026	.029 .029
Over \$50,000 AGI	.016	.012	.023	.010	.016 .012
Noncorporate Equipment					
Five-Year Life Expensed	.029			.041	.042
Level of Interest Rates	.100	.074	.094	.087	.089 .091

Source: Except for the calculations for the Senate Finance Committee, these numbers are based on Hendershott (1986).

Table 2

Risk-Adjusted Net Rental Costs
(5 Percent Inflation Rate)

Corporate Investments	PreERTA	Post ERTA/TEFRA
Inventories	.100	.110
Equipment	.054	.030
Public Utilities	.063	.057
Structures	.079	.066
Depreciable Real Estate	.039	.039
Owner-Occupied Housing		
Under \$50,000 AGI	.025	.036
Over \$50,000 AGI	-.001	.013
Level of Interest Rates	.130	.141

Table 3

Change in Risk-Adjusted Net Rental
Costs as Inflation Rises from 0 to 10 Percent

	Current Law	Treasury Plan	Administration Plan	House Bill
Corporate Investments				
Inventories	.017	.018	.030	.023
Equipment	.016	.017	.003	.014
Public Utilities	.011	.018	.003	.009
Structures	.005	.018	.003	.007
Depreciable Real Estate	-.015	.004	-.011	-.007
Owner-Occupied Housing				
Under \$50,000 AGI	.012	-.005	.013	.008
Over 50,000 AGI	-.015	-.021	-.005	-.013
Change in Level of Interest Rates	.146	.115	.145	.139

FOOTNOTES

1. These calculations are somewhat controversial because the impacts of double taxation and the riskiness of investments on relative hurdle rates are uncertain. If the personal tax rate on share returns is taken to be a 40/60 weighted average of the tax rates on dividends and capital gains, the 40 reflecting the percentage of real corporate earnings that historically have been paid out, then double taxation causes a large wedge in hurdle rates. In contrast, if a 10/90 weighted average is employed, reflecting the proportion of equity capital raised by new share issues rather than retained earnings the wedge is much smaller (Auerbach 1983, 918-926). Similarly, if one accepts the analysis of Bulow and Summers (1984), risk creates a large wedge, but this is not true under the framework of Gordon and Wilson (1986). An intermediate wedge, based upon a 10/90 dividend/capital gains tax assumption and the Bulow-Summers analysis, is built into the estimates in Table 1.

2. These conclusions regarding the Treasury plan differ from those of Fullerton and Henderson (1986, Table 5) who find that the relative advantage to owner-occupied housing would rise only half as much. The differences in the two studies is largely attributable to different assumptions regarding home mortgage financing. Because mortgage interest expense would be fully deductible but mortgage (bond) interest income would be only partially taxed, I have assumed that households would raise their loan-to-value ratios from 67 percent to 85 percent. The gain from this pure tax arbitrage -- issuing mortgage debt and investing in GNMA securities -- is an effective reduction in the rental cost of housing, the collateral of which is needed for the arbitrage. Fullerton and Henderson assume a base case loan-to-value ratio of only 33 percent and no increase in response to the Treasury plan. (When I

analyze the Treasury plan with full interest indexation -- home mortgage interest, too, is only partially deductible -- the relative advantage to owner-occupied housing increases by only 1/3 percentage point.)

REFERENCES

Auerbach, A.J., 1983, "Taxation, Corporate Financial Policy and the Cost of Capital," Journal of Economic Literature, 21, September, 905-940.

Bulow, J.I. and L.H. Summers, 1984, "The Taxation of Risky Assets," Journal of Political Economy, 92, 20-39.

Fullerton, Don and Yolanda Henderson, 1987, "The Impact of Fundamental Tax Reform on the Allocation of Resources," in Martin Feldstein (ed.), The Effects of Taxation on Capital Formation, University of Chicago Press.

Gordon, R.H. and J.D. Wilson, 1986, "Measuring the Efficiency Cost of Taxing Risky Capital Income," NBER Working Paper.

Gravelle, Jane, 1982, "Effects of the 1981 Depreciation Revisions on the Taxation of Income from Business Capital," National Tax Journal, 35, March, 1-20.

Hendershott, P.H., 1986, "Tax Changes and Capital Allocation in the 1980s," in Martin Feldstein (ed.), The Effects of Taxation on Capital Formation, University of Chicago Press.

Hendershott, P.H. and D.C. Ling, 1986, "Likely Impacts of the Administration Proposal and the House Bill," in James Follain (ed.), Tax Reform and Real Estate, The Urban Institute.