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ECONOMIC EFFICIENCY IN RECENT TAX REFORM HISTORY: POLICY REVERSALS OR CONSISTENT IMPROVEMENTS?

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ABSTRACT

The Economic Recovery Tax Act of 1981 reduced personal marginal tax rates and provided significant business tax breaks. Subsequent changes through 1985 cut back on business allowances. The Tax Reform Act of 1986 reduced marginal rates again, but added significantly to business taxes. Was there any unifying theme to these tax changes, or do they represent frequent changes in course for tax policy?

This paper uses a general equilibrium model capable of second-best analysis to investigate the net effects on efficiency of each of these changes in capital income taxation. Under the new view that dividend taxes are unimportant investment disincentives, there is no set of other parameters in the model for which these changes generate improvements in efficiency. Under the old view that dividend taxes are important, however, these changes all increase efficiency for a wide range of values for other parameters in the model.

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I. Introduction

Few areas of public policy have seen changes as frequent or as dramatic as those in tax policy, with major legislation in almost every year from 1980 to 1986. These tax revisions may reflect an evolving economic environment, changing views of individual leaders, or simply shifts in political coalitions. They may appear almost random, however, at least with respect to any one of the multiple and sometimes conflicting objectives of tax policy. We might ask whether these tax changes reflect any consistency with respect to revenue, economic efficiency, distributional effects, or any of a number of noneconomic objectives of tax policy.

Tax initiatives enacted during the Reagan Administration might seem particularly inconsistent with respect to the economic efficiency of taxes on income from capital. The Economic Recovery Tax Act of 1981 (ERTA) reduced personal tax rates and depreciation recovery periods, but it favored some assets more than others. It thus appeared to promote saving and capital formation at the expense of a level playing field. It also reinforced a trend in revenue sources away from taxes on capital such as the corporate income tax. Subsequent changes through 1985 retrenched somewhat on the generosity of depreciation allowances. Then the Tax Reform Act of 1986 (TRA) repealed the investment tax credit, lengthened depreciation lifetimes, and added almost $30 billion per year of revenue to the corporate income tax. Birnbaum and Murray (1987) refer to cost recovery provisions in an Administration forerunner of the Tax Reform Act as "an abrupt about-face, a 180-degree reversal

from four years earlier.... a remarkable flip-flop" (pp. 50-51). It may seem almost inconceivable that these changes were all part of a coherent plan.

There are, however, some unifying threads in these tax initiatives. Both ERTA in 1981 and TRA in 1986 were supported by claims of economic efficiency. In the former case, supply-side rhetoric about work effort and saving was reinforced by economists' measures of distortions in households' choices between labor and leisure or between present and future consumption. In the latter case, rhetoric about the level playing field was reinforced by economists' measures of distortions in firms' choices among investments. Moreover, all such measures of economic efficiency are enhanced by lower marginal tax rates. Birnbaum and Murray (1987) also note that "Reagan wanted to go down in history as the president who cut the top tax rate at least in half, from 70 percent to 35 percent or lower. If abandoning business tax breaks and raising corporate taxes was the price he had to pay to achieve that goal, so be it" (p. 286).

Were these tax changes essentially random, or is there some set of prior beliefs about parameter values under which efficiency consistently increases? To address this question, we measure the economic efficiency of capital tax provisions in this series of tax initiatives using a disaggregate general equilibrium model of the U.S. economy and tax system. This model can measure second-best efficiency effects of personal and corporate tax policies, including effects on overall capital formation, and on the allocation of resources among assets, between the corporate and noncorporate

sectors, and among industries. We also point out the importance of key unknown parameters such as the elasticity of substitution among assets and the elasticity of savings with respect to the net rate of return.

The generality of the model is important. For example, Fullerton and Henderson (1985) evaluate the 1981 Act using a more restricted model that concentrates on intertemporal distortions. In that model, firms use fixed combinations of assets, and ERTA always generates welfare gains. Here, we use a more general model developed by Fullerton and Henderson (forthcoming) in which asset choices are endogenous. In this model, even with moderate substitution parameters, the less uniform taxation in ERTA can generate welfare losses. For another example, Auerbach (1983) and Gravelle (1981) concentrate on asset distortions but assume Cobb-Douglas production functions. Our more general functional forms allow us to show how the ranking of tax reforms can be reversed for non-unitary elasticities of substitution.

Using results of this model, we interpret recent tax reform history. We have no formal model of political decisionmaking, but it is interesting to see how beliefs about the relative importance of different efficiency effects might have supported policymakers' views about the ranking of alternative reforms. ERTA may have been supported by those who believed that capital formation is important (or, in this model, that the saving elasticity is high), but it increases economic efficiency only when the level playing field is unimportant (in this model, when the elasticity of substitution among assets is low). The aspects of the 1986 Act that reversed

ERTA may have been influenced by changing beliefs about the relative size of those parameters or importance of those effects.

Results also depend on the assumed effect of dividend taxes. Under the "new view" that dividend taxes have little effect on investment incentives, there is no set of substitution and saving elasticities for which these tax initiatives led to consistent improvements in economic efficiency. Under the "old view", however, reduction of personal taxes on dividends does affect incentives. In this case, for quite reasonable bounds on elasticities in our model, every change in the 1980's led to improvements in efficiency. An interpretation is that policymakers adhere to incremental reform.

We emphasize that recent tax policy decisions were influenced by revenue considerations, distributional effects, and noneconomic objectives. Those effects are entirely ignored here in order to focus on efficiency. The next section summarizes the general equilibrium model used in this paper. The third section provides some new results on the efficiency effects of recent tax initiatives. A fourth section discusses scenarios under which these initiatives could have led to consistent increases in efficiency.

II. A General Equilibrium Model for Second-Best Efficiency Analysis

The consumption side of the model is taken from Fullerton, Shoven and Whalley (FSW, 1983), where households have initial endowments of labor and capital and maximize utility by choosing among present consumption goods, leisure, and saving. The elasticity of substitution between consumption and leisure is

specified exogenously to be consistent with an uncompensated labor supply elasticity (0.15 for these calculations). Similarly, the elasticity of substitution between present and future consumption is specified to be consistent with an uncompensated saving elasticity. This parameter is set to Boskin's (1978) estimate of 0.4 for most calculations, but it is varied between 0.0 and 0.8 for others.[1]

In deciding how much to save, households myopically use current prices as expected future prices. We then calculate a sequence of equilibria in which endogenous saving from one period augments the capital stock in the next period. Labor force growth is set exogenously to place the 1980 baseline equilibrium on a steady state path. Domestic saving is the only source of investment funds, since the model is not open to international capital flows.

As in the FSW model, producers in each of 18 industries have fixed requirements of intermediate inputs but can substitute between labor and capital in Constant Elasticity of Substitution (CES) value-added functions.[2] As in Fullerton and Henderson (forthcoming), however, producers react to a marginal cost of capital. They each use a nested CES function to allocate capital between the corporate and noncorporate sectors (or, in housing, between the rental and owner-occupied sectors). The elasticity of substitution between sectors does not affect major points made in

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[1]The saving elasticity is used to calculate the model's elasticity of substitution between present and future consumption which is then fixed for simulations of alternative policies.

[2]The model also assumes perfect competition, perfect mobility, perfect information, no externalities, and no involuntary unemployment.

this paper, so it is set to unity for all calculations reported.[3] In a final CES nest, for each sector of each industry, firms allocate capital among up to 38 assets including 20 types of equipment and 15 types of structures, plus inventories and residential and nonresidential land. The elasticity of substitution among assets is varied in calculations below.

For each asset in each sector, the cost of capital is the marginal pretax return needed to earn the equilibrium posttax return.[4] These calculations include the effects of statutory tax rates, investment tax credit rates, particular depreciation rules, and the personal taxation of interest, dividends, and capital gains. All assets provide the same posttax rate of return, but they must earn different pretax returns or marginal products in order to pay taxes that differ by asset. Differential tax rules thus give rise to interasset distortions. The "double taxation" of corporate source income and the nontaxation of imputed net rents in owner-occupied housing mean that capital in different sectors must earn different marginal products, giving rise to intersectoral distortions. Finally, all taxes on capital drive a wedge between

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[3]No evidence is available on the elasticity of substitution between sectors. Indeed, little is known about the incorporation decisions of firms. The CES function is intended only as a representation of that decision, and of the possibility that taxes affect it.

[4]See, for example, Hall and Jorgenson (1967). We assume a 4 percent required real return net of all taxes for the original (1980) equilibrium, a constant 4 percent inflation, no uncertainty, no churning, and sufficient tax liability to use all credits and deductions. Effects of uncertainty and imperfect loss offsets are discussed in Auerbach (1986).

the price paid by firms and the return received by savers. Taxes thus raise the price of future consumption and create intertemporal distortions.

To ensure comparability, we wish to abstract entirely from changes in government expenditure. In addition, we wish to concentrate on changes in capital taxes. Thus we make each regime "revenue neutral" relative to 1980 by the imposition of a lump-sum tax or rebate to households, and we omit changes in labor tax rates.

Given behavioral rules and parameters, the model searches for an equilibrium by iterating on a wage rate, a posttax rate of return, and the lump-sum tax (or rebate) needed to maintain real government expenditures. At each iteration the model finds the cost of capital for each asset in each sector and evaluates all demands. Equilibrium is found when the total demand for capital matches its fixed supply for that period, the total demand for labor matches its endogenous supply, and total tax revenue matches government expenditures. To calibrate the model, exogenous substitution parameters and tax rules are used together with a consistent benchmark equilibrium data set to solve for other parameters that allow the model to replicate the benchmark data set as an equilibrium solution. Tax changes then generate alternative sequences of equilibria that are compared to the benchmark by calculating the present value of equivalent variations.

There are many assumptions and parameters that influence the results from this model, but three are most important for present purposes. First, the importance of intertemporal effects is related to the prespecified size of the elasticity of saving with respect to

the net rate of return. We set this to 0.4 for most calculations but vary it from 0.0 to 0.8 for others.[5] Second, the importance of interasset effects is related to the elasticity of substitution among assets in production. There is very little evidence on appropriate values for this parameter, so we set it to one for standard calculations and vary it from zero to 2.0 for comparisons.[6] Finally, given that the 1986 Act increases the capital gains tax while decreasing the personal tax on dividends, the ranking of these reforms depends in an important way on the relative weights given to those two forms of corporate income. There is no evidence on how firms finance marginal investment, so we make two alternative assumptions. One set of calculations assumes that new corporate investment is financed in the same proportions as past investment: 34 percent by debt, 62 percent by retained earnings, and 5 percent by new share issues.[7] Because the weight is so low on new share issues, for which dividend taxes matter, we call this the "new view" (see Auerbach, 1979, Bradford, 1981, and King, 1977). The other set of calculations assumes that corporate equity is equally divided

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[5]Boskin's (1978) saving elasticity is about 0.4, but Howry and Hymans' (1978) estimate is near zero. Ballard et al (1985) review these and other estimates.

[6]Berndt and Christensen (1973) found a high elasticity of substitution between equipment and structures, but Mohr (1980) disputes it. These and other estimates are reviewed in Hulten and Wykoff (1981a) and Mackie (1985). Our elasticity of substiution among 38 assets has never been estimated.

[7]The noncorporate sector and housing are financed one-third by debt and two-thirds by equity. Financing is exogenous and identical for all assets. As a consequence, we omit tax-related distortions in firms' financial decisions and the possibility that the cost of capital can be lower for predominantly debt-financed assets. Debt-equity ratios are not available by asset, but see Gordon, Hines, and Summers (1987).

between retained earnings and new share issues. Dividend taxes are more important, and so we call this the "old view" (see McLure, 1979).[8]

III. The Effects of Tax Reforms

In 1980, when President Reagan was elected, the top statutory corporate tax rate was 46 percent, and personal rates extended up to 70 percent.[9] Most equipment received a 10 percent investment tax credit, and capital cost recovery periods were based on the Asset Depreciation Range (ADR) system. Besides lowering all personal rates, including the top rate from 70 to 50 percent, the Economic Recovery Tax Act of 1981 expanded the investment tax credit and created the Accelerated Cost Recovery System (ACRS) which shortened all depreciation lifetimes. Table 1 shows that the fully phased-in version of this bill would have lowered the cost of capital in the corporate sector from 7.0 to 5.9 percent under the new view (8.5 to 7.0 percent under the old view). ERTA also reduces the overall cost of capital, which includes the noncorporate sector and owner-occupied housing.

To indicate tax differences across sectors or across assets, the table also shows the coefficient of variation of the cost of

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[8]Empirically, the new view is supported in Auerbach (1984), but the old view is supported in Poterba and Summers (1983, 1985). Poterba and Summers (1985) explain some conceptual problems with each view.

[9]For each tax law, the Treasury's individual tax file with 90,000 households was used to calculate the weighted-average personal marginal rate on interest receipts, dividends, capital gains, noncorporate business income, and mortgage interest deductions. These rates were then modified to account for taxes at the state level, the taxation of banks, insurance companies, and the holdings of tax-exempt institutions.

capital under each tax regime. By reducing the taxation of depreciable assets in the corporate sector, ERTA brought overall corporate taxes more in line with other sectors and consequently reduced slightly the coefficient of variation across sectors. However, ERTA widened the difference between depreciable assets and other assets such as land and inventories.[10] Both across assets and overall, ERTA has the largest coefficient of variation of the four tax regimes.

Further changes were enacted each year through 1985. The rate of declining balance for depreciation was reduced, and the depreciation lifetime for structures was increased. In addition, inflation eroded some of the personal rate reduction through bracket creep. By 1985, when brackets were to be indexed, the cost of capital in the corporate sector had risen back up from 5.9 under ERTA to 6.5 percent, using the new view financing assumptions (from 7.0 to 7.7 percent using the old view). The coefficient of variation across assets fell back from .37 to .25 as shown in Table 1.

The Tax Reform Act of 1986 revamped tax rules again. Personal tax rates were reduced to a top marginal rate of 33 percent, and the statutory corporate rate was cut from 46 to 34 percent. The investment tax credit was repealed, and depreciable assets were divided into a larger number of categories intended to reflect

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[10]The accelerated depreciation in ERTA may have been intended to offset the effects of high inflation. At our 4 percent inflation rate, however, the combination of the investment tax credit and ACRS meant that equipment investment actually received a net subsidy at the corporate level.

differences in economic depreciation. Finally, the 1986 Act repealed the capital gains exclusion.[11]

The table shows that these changes raise the corporate cost of capital from 6.5 to 7.5 percent under the new view where cuts in personal taxes on dividends are relatively unimportant (from 7.7 to 8.0 under the old view where cuts in dividend taxes are more important). Under the new view the cost of capital is higher than it was in 1980, but under the old view it is lower than it was in 1980. Under either financing assumption, the attempt to "level the playing field" was effective in the sense that the 1986 Act provides coefficients of variation that are lower than those of other tax laws.

General equilibrium results for all tax laws appear in Figures 1-4. The vertical axes show the present value of equivalent variations, in 1984 dollars. For comparison, each $200 billion of welfare gain represents about 0.2 percent of total welfare, the present value of income plus leisure in the baseline of 1980 law. Figures 1 and 2 show the new view, while Figures 3 and 4 show the old view. In contrast, Figures 1 and 3 set the saving elasticity at 0.4 and vary the elasticity of substitution among assets, while Figures 2 and 4 set the asset parameter at 1.0 and vary the saving elasticity. These figures can be used to illustrate the following new results:

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[11]All calculations refer to the fully phased-in version of the law. The model includes considerable disaggregation and detail such as the half-year convention, the half-basis adjustment, LIFO inventory accounting, and noncorporate taxes. It assumes fully taxable firms, however, and thus ignores changes in the minimum tax, passive loss rules, and some other specific changes in 1986.

A. The 1981 Act does not always generate welfare gains. In previous studies such as Fullerton and Henderson (1985), each industry was constrained to use assets in fixed proportions. That model thus captured the intertemporal welfare gains of ERTA but not the interasset welfare losses. Figure 1 shows that ERTA does indeed increase welfare when the elasticity of substitution is near zero (as when assets are used in fixed proportions), but intertemporal gains are completely offset if the interasset substitution parameter is 0.7 or greater. Under the old view, in Figure 3, ERTA's dividend tax cuts help to keep welfare gains positive until the substitution parameter is more than 1.5. Figures 2 and 4 show that ERTA's welfare gains increase with the saving elasticity.[12]

B. It may be convenient to use Cobb-Douglas functional forms when substitution parameters are unknown, but results can be very misleading. Given the dearth of information about the elasticity of substitution among disaggregate types of equipment and structures, Auerbach (1983) and Gravelle (1981) use the common Cobb-Douglas form. Figure 1 shows that the same unit elasticity assumption in this model would favor the efficiency of the level playing field in the Tax Reform Act of 1986. However, a slightly lower elasticity would favor the 1985 tax law, and a still lower elasticity would favor the 1981 Act. These elasticities are all within the range of possible estimates. Despite the apparently definitive results of a Cobb-Douglas model, we do not know which of the three tax regimes has the largest welfare gain.

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[12]Note that ERTA has the largest revenue losses and lump sum tax replacement of any simulation, so even these reduced efficiency gains may be overstated.

IV. Conditions for Consistency

We consider consistency in terms of economic efficiency, and we investigate conditions in this model where the reforms provide successive welfare improvements.[13] Efficiency gains depend on two key elasticity parameters, but a three-dimensional diagram quickly becomes unwieldy. Instead, Figure 5 varies the two key parameters under the new view and shows the area over which each reform dominates. ERTA 1981 dominates all other reforms in area A, the 1985 law dominates in area B, and TRA 1986 dominates in area C. Figure 6 varies the two key parameters under the old view and shows only the area in which the three reforms generate successive improvements. These figures help demonstrate the following two points:

A. Under the new view, there is no set of parameters for which tax initiatives during the Reagan Administration led to successive welfare improvements. Figure 5 confirms that the 1981 Act dominates the other tax regimes, in terms of efficiency, only when the elasticity of substitution among assets is small (for a wide range of values for the intertemporal subsitution parameter). The 1985 law dominates when the asset substitution parameter is around 0.5, and the 1986 Act dominates when it is larger. The area in which the 1986 Act dominates is not an area of successive improvements, because ERTA always generates welfare losses with this high degree of interasset substitution.

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[13]Because we use equivalent variations, results are transitive in the sense that the difference between the welfare gains of two reforms represents the welfare gain in baseline prices of moving from one reform to the other.

Under the new view, where dividend tax reductions are relatively unimportant, tax changes may seem random. In fact, randomness may cause additional welfare costs (Skinner, 1986, Alm, 1988) or benefits (Stiglitz, 1982, Chang and Wildasin, 1986). The apparently random changes may arise from shifting political coalitions, despite well ordered individual preferences.

Even under the new view, however, each change may have been a rational response to available information and consensus views.[14] Debate in 1980-81 was heavily influenced by the supply-side school of thought, and the consensus view may have held that the saving elasticity was very high. In addition, policymakers may have been uninformed or unconcerned about interasset distortions. Certainly more of the discussion was about capital formation than about level playing fields. Thus ERTA may have been viewed as the highest ranking reform on efficiency grounds.[15] Then changes in tax law through 1985 might be explained by changes in the actual or perceived importance of these distortions. Discussion of interasset distortions did not begin until Auerbach and Jorgenson (1980), Gravelle (1981), and Hulten and Wykoff (1981b). These papers were among the first to use Hall-Jorgenson type formulas to calculate

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[14]This discussion presumes that all three analyzed tax regimes were available as options in 1981. Implicitly they were. Explicitly, in fact, debate at the time included consideration of the Auerbach-Jorgenson (1980) first-year recovery system, a proposal to provide economic depreciation at replacement cost. Although a major point of that proposal was to remove the effects of inflation, its results in this model would look very similar to those of the 1986 legislation because we do not consider varying inflation.

[15]Substitution elasticities are generally high in the supply-side view, however, and ERTA would reduce welfare with a high asset substitution elasticity.

differences in the marginal effective tax rates among assets used in production. They came too late to affect the 1981 legislation, but may have influenced subsequent changes. Finally, stories about tax shelters may have combined with new results on interasset distortions to raise the implicitly held elasticity of asset substitution, making the Tax Reform Act of 1986 perceived as most efficient. Similarly, new estimates or other results on intertemporal distortions may have helped change the consensus views about parameters in Figure 5 from area A, to B, to C.

B. Under the old view, where dividend taxes matter, continued personal rate reductions led to successive efficiency gains throughout the 1980s for a wide range of parameters in this model. When the saving elasticity is 0.4, Figure 3 shows that there is a wide band of values for the asset substitution parameter (between 0.5 and 1.5) for which each tax change in the 1980s provides an additional welfare gain. When the asset substitution parameter is 1.0, Figure 4 shows the same result for all values of the saving elasticity. With a systemmatic variation of both parameters, Figure 6 shows that as the savings elasticity is higher, successive improvements occur for a higher range of asset substitution parameters.

The figures demonstrate the possibility of a coherent agenda to achieve successive efficiency improvements. In fact, if a significant part of marginal corporate finance is new share issues, then

recent tax policy has been consistent by this definition for a wide range of quite reasonable values of the two key elasticities.[16]

This case also sheds some light on the theory of tax reform, which holds that optimal tax changes may result in a tax structure different from that of optimal de novo tax design. Feldstein (1976) analyzes a number of different implementation rules, including delayed effective dates to allow time for adjustment, and Zodrow (1981) demonstrates some advantages for immediate enactment of partial reform. If results for the old view are any indication, policymakers may adhere to incremental reform. Moreover, such steps may appear to take different directions. For example, some additional interasset distortions in ERTA may have been a necessary political price of achieving large reductions of intertemporal distortions. Changes through 1985 and 1986 may then have addressed the interasset margin while trying to minimize losses on the intertemporal margin.

V. Concluding Remarks

Clearly, tax policy is not driven by any single criterion such as the measure of economic efficiency used in this paper. Indeed, decisions are not made by any single political agent. The different policymakers in this process place different relative weights on revenue considerations, distributional effects, many noneconomic objectives, and possibly economic efficiency. The limited purpose

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[16]Poterba and Summers (1983, 1985) find support for the old view of dividend taxes. Mackie (1985) reviews estimates of the elasticity of substitution among assets, and Ballard et al (1985) review saving elasticities.

in this paper is to investigate how the last of these considerations may have affected tax policy decisions since 1980.

We employ a detailed general equilibrium model of the U.S. economy and tax system to evaluate the efficiency effects of recent tax law changes. This model is capable of second-best analysis of simultaneous distortions in households' saving decisions, firms' sectoral location decisions, and producers' asset combination decisions. This simultaneity is important for analyzing the particular reforms considered here, but it may come at the expense of a better model for each distortion considered separately. Although this model is comprehensive, it is not without limitations. It adopts particular assumptions, for example, that there are no adjustment costs, noncompetitive behaviors, or distortions other than taxes.

One does not need to accept all the assumptions of the model, however, to follow the logic of the interpretations. With the new view that taxes on dividends are relatively unimportant, recent tax reforms appear inconsistent. Advocates of the Economic Recovery Tax Act of 1981 may have knowingly exacerbated interasset distortions in order to reduce intertemporal distortions, and subsequent legislation may have been a rational response to new information or to a new consensus about the relative importance of those distortions. Alternatively, with the old view that dividend taxes matter, these reforms may have been part of a coherent plan to acheive greater economic efficiency through incremental tax reform.

Table 1

The Cost of Capital and Its Coefficient of Variation for Each Tax Regime

	Cost of Capital (%)		Coefficient of Variation		
	Corporate Sector	Overall	Across Sectors	Across Corporate Assets	Overall
New View					
1980 Law	7.0	6.3	.10	.25	.21
ERTA 1981	5.9	5.8	.08	.37	.25
1985 Law	6.5	6.1	.09	.25	.20
TRA 1986	7.5	6.5	.09	.07	.14
Old View					
1980 Law	8.5	6.9	.15	.23	.27
ERTA 1981	7.0	6.2	.12	.34	.28
1985 Law	7.7	6.6	.13	.24	.24
TRA 1986	8.0	6.7	.10	.07	.17

Authors' calculations. All terms are defined in the text.

The Present Value of Welfare Gains from the 1980 Law Baseline, in Billions of 1984 Dollars

Fig. 1 (Saving Elasticity 0.4, New View)

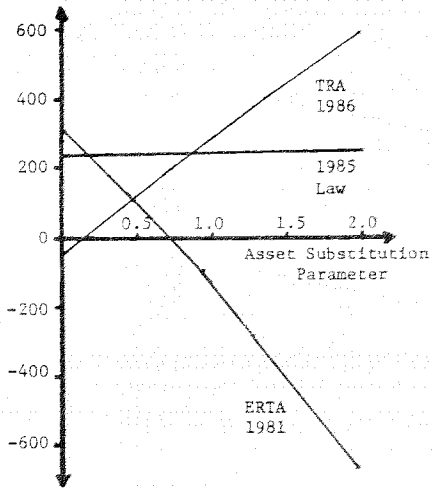


Fig. 2 (Asset Substitution Parameter 1.0, New View)

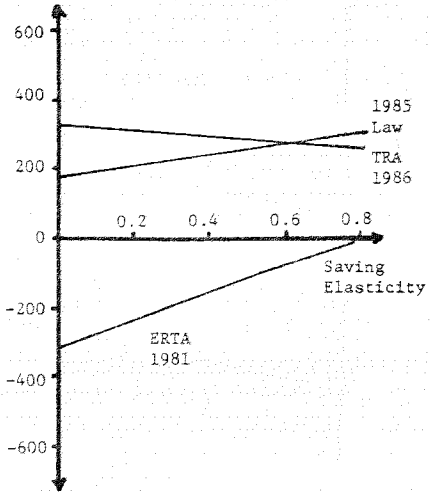


Fig. 3 (Saving Elasticity 0.4, Old View)

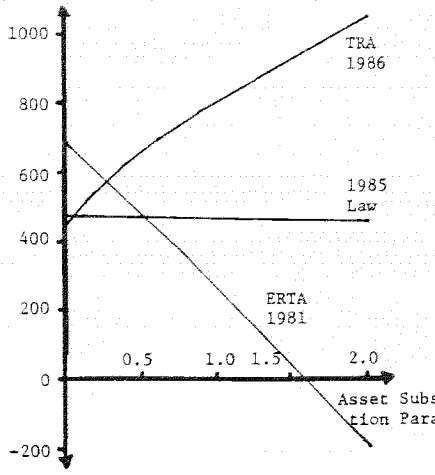


Fig. 4 (Asset Substitution Parameter 1.0, Old View)

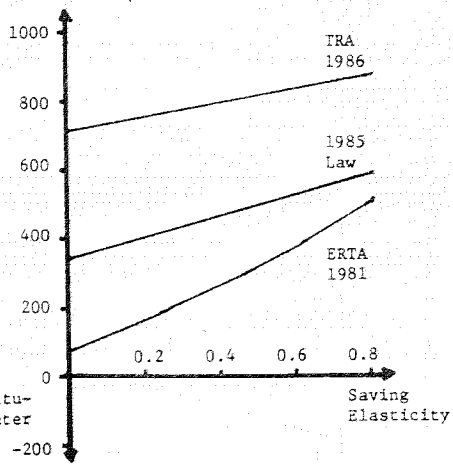


Figure 5
Regions of Efficiency Dominance for Each Tax Regime, New View

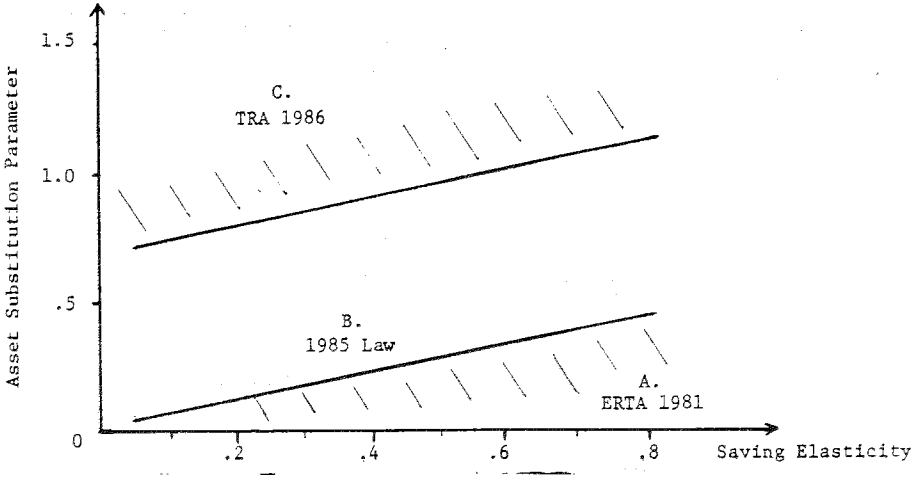
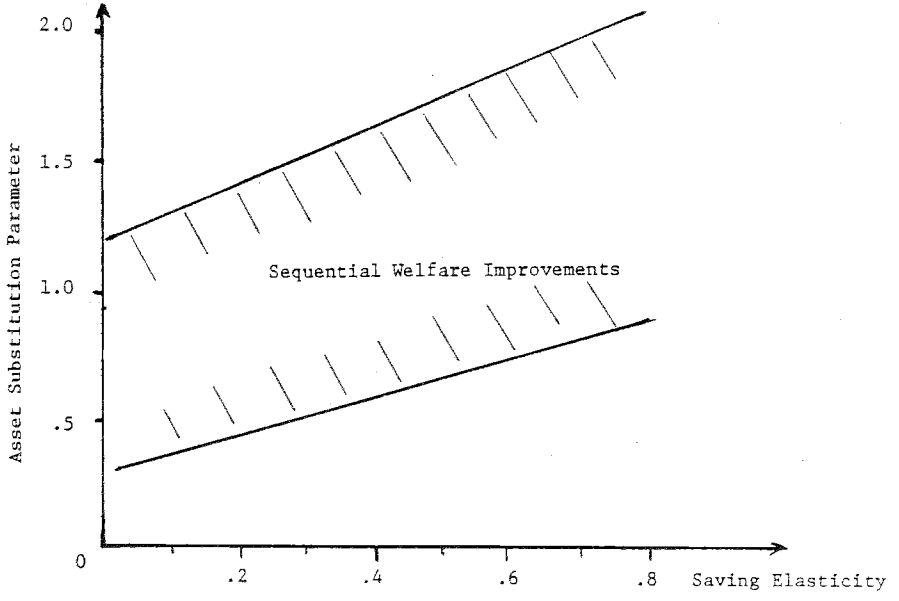


Figure 6
Region of Sequential Welfare Improvements, Old View



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