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PROSPECTIVE CHANGES IN TAX LAW AND THE VALUE OF DEPRECIABLE REAL ESTATE

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Depreciable Real Estate

ABSTRACT

The Economic Recovery Tax Act of 1981 significantly reduced the taxation of income-producing properties by accelerating tax depreciation on both new and, especially, existing properties. A partial reversal of the 1981 legislation appears likely. To provide some insight into the possible effects of a decrease in tax depreciation of income-producing properties, two potential tax changes are analyzed: an increase from 15 to 20 years in the tax service lives of both new and existing properties and an increase for existing properties only. Both residential and commercial/industrial properties are considered.

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Section 1

INTRODUCTION

The Economic Recovery Tax Act of 1981 (ERTA) significantly reduced the taxation of income-producing properties by shortening the cost recovery periods (tax lives) of both new and existing properties. Such an increase in tax depreciation would, *ceteris paribus*, raise property values and reduce the level of real rents. However, we likely will not experience the full increase in values and decline in rents because a partial reversal of the 1981 Act is already in process.

In March 1984, the U.S. Senate Finance Committee approved a lengthening of cost recovery periods for both residential and commercial properties from 15 to 20 years.[1] This bill would also recapture, at the time of sale, all of the excess depreciation even if an installment sale were utilized. In April 1984, the full Senate passed a bill increasing the tax service lives to 20 years in 1984, 19 years in 1985 and 18 years thereafter. What form final legislation will take depends on the outcome of a Senate-House conference and the concurrence of both full bodies of Congress and the President.

In this paper, we calculate the impact that alternative tax changes would have on the value of both residential and commercial/industrial properties. Two separate proposals are considered in detail. The first would increase tax lives from 15 to 20 years on both new and existing conventional residential and commercial properties. The second would increase tax lives of existing properties only. The less-favorable treatment of existing properties relative to new ones would be consistent with the pre-ERTA tax environment.

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[1] Under the current proposal, the 15 year recovery period would remain available to investors in qualified low income housing.

Our model, which extends analyses of earlier tax code changes in two important respects, is presented in Section 2, and the results for the two tax changes are reported in Sections 3 and 4. Section 5 contains an informal analysis of the recapture provision and other minor possible variants of the 1984 legislation and provides a general equilibrium prospective. The paper is summarized in Section 6.

Section 2

THE MODEL AND PARAMETERIZATION

The key element in the computation of investment value responses to tax code alterations is a simulation model that translates the expected cash flows associated with a property (net operating income, debt service payments, depreciation and interest tax savings, and sales proceeds-net of selling costs and tax liabilities) into a market price (value). The model developed by Ling and Whinihan (1984) simultaneously determines the optimal expected year of sale, the sales price in that year (and in all other years because they are needed to specify the optimal year of sale), and the optimal depreciation method. Of course, all expected future sales prices (and optimal holding periods) depend upon all future cash flows, including tax savings and liabilities.[2]

The endogenous determination of future sales prices, rather than the simplifying assumption that they will be the current price marked up for general inflation less depreciation, is crucial to analysis of tax changes

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[2]It should be emphasized that the 'utils' of rental services provided by the property over time are exogenous. That is, the "want satisfying" ability of the property is not dependent upon tax law, interest rates, or any other variables that are subject to change over time. A change in such variables will affect the equilibrium level of rents, but it will not alter the relative pattern of these rents over the property's economic life.

that affect new and existing properties differently, such as ERTA and the five year stretch out of tax depreciation on existing properties only analyzed in Section 4.[3] As is shown there, prices of existing properties clearly have a life of their own, a life that affects prices of new properties and long-run equilibrium market rents unless trading was suboptimal prior to the tax change and is suboptimal after the change.

The second novelty of the model is an explicit consideration of supply factors. This includes both allowing market rents to adjust to their long-run value with a lag and letting reproduction costs or the long-run supply price respond to changes in demand.

2.1 The Valuation Equation

The basic valuation equation employed within the dynamic programming algorithm is the traditional discounted cash flow equation that measures and values cash flows to the equity position after all operating, financial, and tax expenses have been paid. Assume that

1. the fraction xl of the property's purchase price is financed at the mortgage or debt rate Rd,
2. the costs associated with refinancing during the holding period are prohibitive,
3. the property is expected to be sold after h years at which time a brokerage commission of B percent will be paid, and
4. the cash flows are discounted at the nominal, after-tax, return on equity, Re.

The value of the property at the beginning of year j is:

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[3] For analyses of ERTA that make the simplifying assumption, see Bruggeman, Fisher and Stern (1982) and Hendershott and Shilling (1982).

$$V(j,h) = \sum_{i=1}^{h} \frac{(1-To)R(i)}{(1+Re)^{i}} + \sum_{i=1}^{h} \frac{ToDEPF(i)P(j)}{(1+Re)^{i}} \quad (1)$$

$$+ \frac{P(j+h)(1-B)}{(1+Re)^{h}} - \frac{Tg[P(j+h)(1-B) - P(j)ACDP(h)]}{(1+Re)^{h}}$$

$$+ L(0) - \frac{L(h)}{(1+Re)^{h}} - \sum_{i=1}^{h} \frac{PAY(i)}{(1+Re)^{i}} + \sum_{i=1}^{h} \frac{ToRdL(i-1)}{(1+Re)^{i}}$$

where V(j,h) = the investment value at the beginning of year j if held h years,

R(i) = net operating income or "rents" in year i of the holding period,

To = marginal ordinary income tax rate,

DEPF(i) = percentage of the initial tax basis that is written off in year i of the holding period,

P(j) = current market demand price,

P(j+h) = competitive market demand price of the property at the end of the holding period,

Tg = marginal capital gains tax rate,

ACDP(h) = percentage of the initial tax basis not written off during the holding period,

PAY(i) = total mortgage payment, and

L(i) = balance of the loan at the end of year i of the holding period.

The first two sums are the discounted values, respectively, of the cash flows from annual operations and the depreciation tax shield. The third and fourth terms represent the before-tax cash flow from the sale of the property and the resulting capital gain tax liability.[4] The remaining four terms capture the cash flow effects of debt financing. L(0) represents the initial value of the

[4]The calculation of the capital gain tax liability in equation (1) assumes that straight-line depreciation is used. In analyses where accelerated depreciation is assumed, the equation is adjusted to reflect the appropriate recapture provisions.

mortgage and L(h) the outstanding loan obligation at the end of the holding period. The two sums are the present values of the mortgage payments and of the tax savings from interest deductions, respectively.

When a standard fixed-rate mortgage is used,

$$PAY(i) = PAY = \frac{Rd \times lP(j)(1+Rd)^{m}}{(1+Rd)^{m} - 1} \qquad (2)$$

and

$$L(i) = \frac{[(1+Rd)^{m} - (1+Rd)^{h}] \times lP(j)}{(1+Rd)^{m} - 1} \qquad (3)$$

where m equals the original maturity of the mortgage. Because P(j) is an endogenous variable equal, for the marginal investor, to V(j,h), the reduced-form market valuation equation is obtained by substituting V(j,h) for P(j) on the right hand side of equation (1) and factoring. In reduced form, current investment value is a function of exogenous parameters and the selling price of the property at the end of the holding period (h years) which is endogenously determined in a prior iteration of the algorithm. The competitive market demand price in year j, P(j), is

$$P(j) = \underset{h \in H}{MAX}\ V(j,h) \qquad (4)$$

where H equals the number of years of remaining economic life. The holding period (h) that maximizes V(j,h) is the optimal holding period for a buyer in year j. The maximum V(j,h) becomes the market price at the beginning of year j. It is then used as an input to the investor's optimization problem in years j-1, j-2, etc.

2.2 Addition of the Supply Side

Equation (1) in conjunction with (4) determines the demand prices for new and existing properties of every vintage. Full equilibrium requires that, for new property, P(j) equals the "supply price" or reproduction cost of a new property, i.e.,

$$P(j) = P_s. \tag{5}$$

The issue here is the specification of reproduction costs or P_s.

The simpliest assumption is that the supply price is independent of the tax law change and thus that there is no long-run change in the value of new properties. A richer model is obtained by positing demand and supply equations for the stock of income-producing properties and solving for the price that equates them. We assume that supply (Q_s) is β elastic with respect to price

$$Q_s = \alpha P^{\beta},$$

and demand (Q_d) is b elastic with respect to rents

$$Q_d = aR^{b},$$

where $\beta > 0$, $b < 0$. Equating and solving for price

$$P_s = ZR^{\gamma}, \tag{6}$$

where $Z = (a/\alpha)^{-\beta}$ and $\gamma = b/\beta$. Simultaneous solution of (1) and (6) -- using (5) -- then determines P and R.

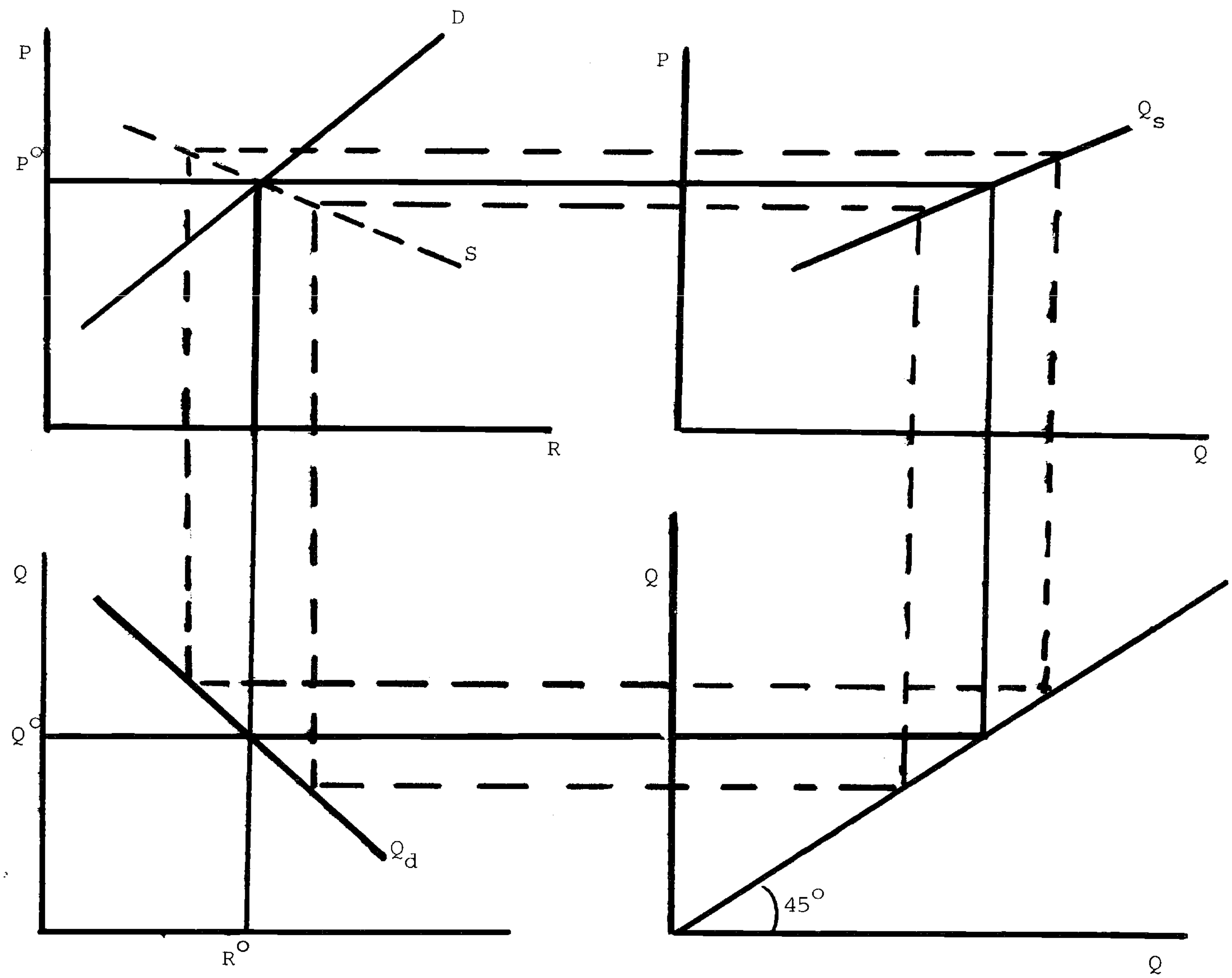
Exhibit 1 illustrates this solution and provides a graphical derivation of the $P_s(R)$ relation. The negative $Q_d(R)$ relation is illustrated in the

--PUT EXHIBIT 1 NEAR HERE--

lower left panel of the Exhibit, and the positive $Q_s(P)$ relation is in the upper right. These quantity relations should be interpreted as relative to trend; both schedules will shift outward over time. Equation (1), after substituting P for V(j,h), gives the positively sloped demand schedule in the upper left panel which is drawn for a specific tax depreciation schedule, discount rate, etc. The market equilibrium price, rent, and quantity (P^o, R^o and Q^o) are those consistent with the three schedules. Alternative sets of P and R that satisfy the Q_s and Q_d functions are obtained by starting with an R value on the Q_d schedule in the lower left panel and moving counter-clockwise through the panels.

An increase in tax service lives (decrease in the depreciation tax shield) will shift the demand curve to the right, raising rents, lowering price, and reducing the stock of income-producing properties. Note that if builders were unresponsive to price -- if the Q_s schedule were vertical (β=0), the supply schedule in the upper left panel would also be vertical and only price would change. On the other hand, if builders were totally responsive to price -- if the Q_s schedule were horizontal ($\beta=\infty$), the supply schedule in the upper left panel would also be horizonal, and only rents and the quantity would change.

Exhibit 1: Simultaneous Determination of Price and Rent



2.3 Parameterization

A 70 year economic life is assumed for the improvements based on the findings of Hulten and Wycoff (1978). A reverse Sum-of-the-Years-Digit (SYD) pattern of economic depreciation is assumed over the 70 year life based on Ling and Whinihan (1984). That is, the utility provided by the improvements and, therefore, gross rents decline at an increasing rate through time. We also assume that operating expenses are proportional to gross rents.

It is assumed that land accounts for 20 percent of the property's initial price and that the value of the land remains constant in real terms. In some year j, the value of the existing property to a new investor is less than the market price of the land (residual land value). This condition is incorporated by modifying the dynamic programming procedure to require that the market price in year j must equal or exceed the nominal residual land value.

We assume ERTA tax law in our base-case simulations which offers identical tax depreciation options to investors in conventional residential and commercial income properties--175 percent declining balance or straight-line with a 15 year cost recovery period. The marginal investor is assumed to be in a marginal tax bracket (To) on regular income equal to 45 percent and have a marginal tax rate on capital gain income (Tg) equal to 18 (0.4x45) percent. We assume that the marginal investor is not affected by minimum tax complications.

For investors in low to medium tax brackets, a measure of their opportunity cost of equity capital is the after-tax mortgage interest rate (plus a risk premium) because fully taxable bonds and mortgages are reasonable investment alternatives for such investors. For higher tax bracket individuals, however, tax-exempt securities provide a better after-tax rate of return. Because the long-term municipal bond rate has generally been 70 percent of the fully taxable rate, the after-tax rate of return on equity is assumed to be equal to 70 percent of the nominal mortgage interest rate adjusted by a risk premium (PREM)

$$Re = 0.7Rd + PREM. \tag{5}$$

PREM is set equal to 8 percent.

Two assumptions with respect to the determination of nominal mortgage interest rates are employed. Case one assumes Fisher interest rates. Rd is equal to the product of the assumed constant, real, before-tax rate of return on debt (RRd) and the expected inflation rate (π) or

$$Rd = (1+RRd)(1+\pi) - 1. \tag{6}$$

RRd is set equal to 4 percent which implies that $d(Rd)/d(\pi) = 1.04$. Because $Re = 0.7Rd+PREM$, the real after-tax discount rate declines with increases in anticipated inflation. Consequently, this specification is labeled the low discount rate case. Case two assumes that nominal mortgage rates respond to changes in inflation in such a way as to keep the real after-tax mortgage rate constant for an investor in the 30 percent marginal tax bracket or

$$Rd = RRd + \pi/0.7, \tag{7}$$

which implies that $d(Rd)/d(\pi) = 1.43$. This specification is labeled the high discount rate case.

Initial loan-to-value ratios, determined either by optimizing behavior (the marginal costs of debt and equity are equal) or leverage constraints imposed by lenders, are assumed to be 80 percent for residential properties and 75 percent for commercial properties. In both cases, the loan must be amortized over 25 years, or by year 70, whichever is less. Nominal operating income (rents) and the nominal residual land value for each year are computed by compounding real values at the expected inflation rate.

Studies of residential housing have provided estimates of the relative price and rent elasticities. There is general agreement that the rent elasticity, b, is about -0.4 [Hanushek and Quigley (1980)]. Supply-price elasticity estimates vary widely. The lowest estimate of β is Poterba's (1980) 2; Smith (1976) provides an estimate of 9. To obtain the greatest plausible slope (in absolute value) for the price-rent relation, we select $\beta = 2$, in which case $\gamma = -0.2$. This will provide a high estimate of the decline in price caused by the tax law change. The supply-price elasticities of commercial and residential properties should be similar. There is less reason for this to be true of the "rent" elasticities, but in the absence of alternative estimates we take b to be -0.4 for commercial properties also.

Section 3

INCREASED TAXATION OF BOTH EXISTING AND NEW PROPERTIES

An increase of the tax service life of all properties from 15 to 20 years will lower property values and raise real rents. Estimates of these impacts for new and existing residential and commercial properties are reported below.

New Residential Properties

Exhibit 2 contains estimates of the impact of the tax law change on new residential properties under two expected inflation senarios (4 and 8

--PLACE EXHIBIT 2 NEAR HERE--

percent), two different discount rates (low and high), and three supply elasticities (zero, infinity, and 2). The exhibit reports the immediate percentage change in real price or value, the long-run (beyond four years) percentage change in real price, and the long-run percentage change in real rents. The specific method of calculating price and rent changes for different supply-price elasticities and a general interpretation of the changes are as follows. For a zero supply elasticity, equation (1) is solved for value assuming constant real rents (R). Thus the percentage change in rents is zero and the immediate and long-run changes in price are equal. For the infinite-elasticity results, real rents are assumed to be constant for four years and then jump to a level consistent with an unchanged real value of new properties at that time. Thus the long-run change in real price is zero; the immediate decline in price reflects the failure of real rents to jump immediately to their new equilibrium level and the constraint that the property earns the market rate of return. In the case of a finite elasticity (2 in our calculations), real rents are constant for four years and then jump to a level consistent with the simultaneous solution of equations (1) and (6). The four-year real rent adjustment is, in our view, conservative in that the resultant decline in value is likely to be on the high side. In fact, real rents will begin to rise shortly after the tax change (or even prior to the actual change if the change is effective retroactively).

EXHIBIT 2

INCREASE IN TAX LIFE OF EXISTING AND NEW PROPERTIES: NEW RESIDENTIAL PROPERTY

	Supply Elasticity (β)	Immediate %Δ in Price	Long-Run %Δ in Real Price	Long-Run %Δ in Real Rents
Inflation Rate of 4%				
Low	0	-12.3	-12.3	--
Discount	∞	-2.5	--	14.0
Rate	2	-4.2	-2.2	12.2
High	0	-10.7	-10.7	--
Discount	∞	-2.5	--	12.0
Rate	2	-4.0	-1.8	9.8
Inflation Rate of 8%				
Low	0	-12.5	-12.5	--
Discount	∞	-2.1	--	14.4
Rate	2	-4.2	-2.5	11.5
High	0	-9.4	-9.4	--
Discount	∞	-2.1	--	10.3
Rate	2	-3.1	-1.2	9.0

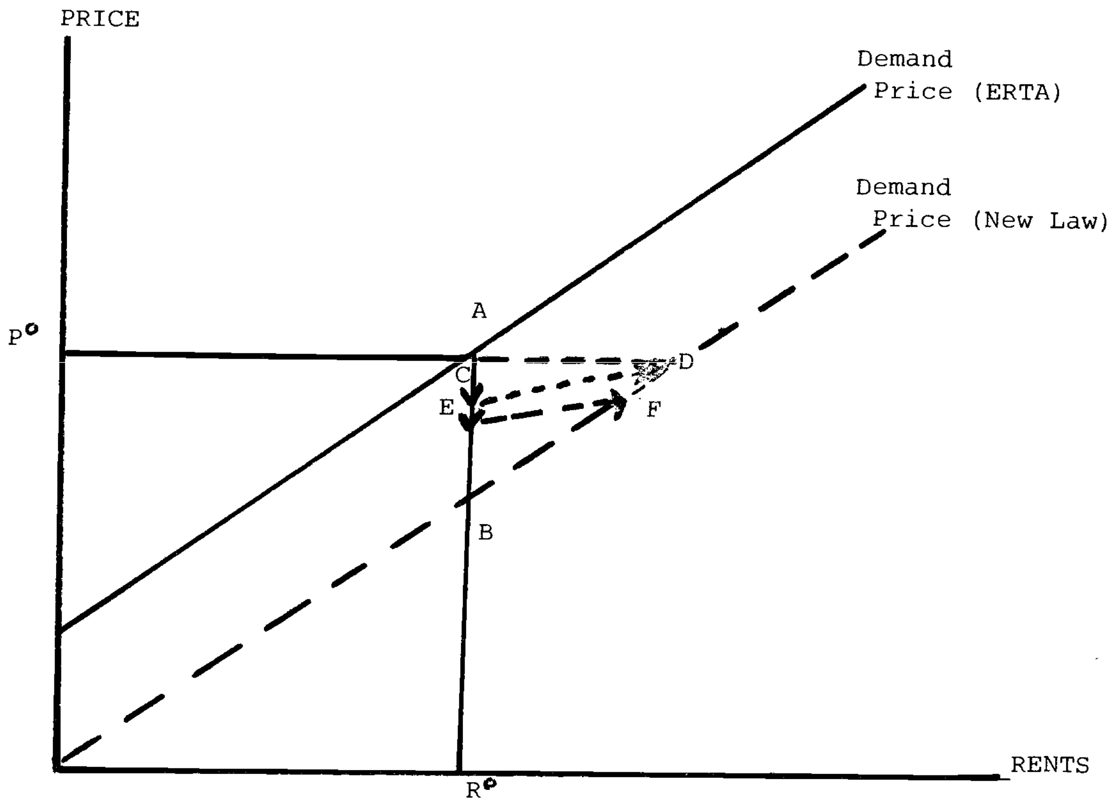
Exhibit 3 illustrates the alternative assumptions and responses. As

--PLACE EXHIBIT 3 NEAR HERE --

noted in the discussion of Exhibit 1, the lengthening of tax life from 15 to 20 years shifts the demand schedule out to the right. Assuming low inflation and discount rates (see the top panel of Exhibit 2) and a zero supply-price elasticity (constant real rents), price (value) would decline by 12.3 percent from point A to B. Because the zero-response case implies that builders would continue to supply new structures at the same rate as prior to the tax law change even though the price at which the structures can be sold to investors has declined by 12.3 percent, this result is totally unrealistic. In contrast, with an infinite supply elasticity, the price of new structures declines by only 2.5 percent from point A to point C. As time passes -- as the years in which new properties will earn below long-run equilibrium rents declines and the demand for the services from income-producing properties grows, real rents and value rise together along the vector CD. Under our assumptions, point D is reached after 4 years. New properties will then command the same real price as they did before the tax law change, and real rents are 14 percent higher. With a finite-supply elasticity, the long-run real price declines by 2.2 percent (point F), and the initial decline in price, reflecting both four years of below long-run real rents and the lower long-run real price, is 4.2 percent (point E). Real rents rise by 12.2 percent in the long run. A "realistic estimate" of the immediate decline in value is 2.5 to 4.2 percent.

Inspection of the remainder of Exhibit 2 reveals little sensitivity of the realistic estimate to alternative assumptions regarding the inflation and discount rates. Increases in these rates do lower the estimated price decline, but only to the 2.1 to 3.1 percent range.

Exhibit 3: An Illustration of Real Price and Rent Responses to a Reduction in Tax Service Lives



Used Residential Properties

Exhibit 4 contains the price changes for existing residential properties. The calculations presume that prior to the tax change the marginal

--PLACE EXHIBIT 4 NEAR HERE--

investor assumed that the real estate provisions of ERTA would be in effect for the remaining life of the property and after the change that the new law will be in effect for the remaining life. The first column lists the remaining years of economic life (70 years is a new property), the second the supply-price elasticity, and the third the percentage change in price. The calculations are performed for the low and high inflation rate and high-discount rate cases. The percentage changes in rents are not reported because they are determined by (and are equal to) those for new properties. The realistic ranges of percentage declines in price are contrasted with that for new properties, 2½ to 4 percent.

Two offsetting factors are at work in these calculations. On the one hand, the four years of below long-run level market rents increases in relative importance as the total number of years that long-run market rents would be earned declines. Thus, the decline in value would be expected to be greater the shorter the remaining life of the property. On the other hand, the ratio of the value of the structure to the total value of the property declines as the property ages. Thus the negative impact of the reduced tax depreciation on the price, ignoring rent changes, is less the shorter is the remaining life of the property. (This is indicated by declining price impacts in the zero elasticity case.) From Exhibit 4, we see that the structure/value effect outweighs the rent effect throughout the first 30 years of life and then again in the last 20 years, but the rent effect dominates in the middle years. In the low inflation rate case, the realistic range of price decline

EXHIBIT 4

INCREASE IN TAX LIFE OF EXISTING AND NEW PROPERTIES: USED RESIDENTIAL PROPERTY

Remaining Yrs. of Econ. Life	Long-Run Supply Elasticity (β)	% Change in Price (low inflation)	% Change in Price (high inflation)
70	0	-10.7	-9.4
70	∞	-2.5	-2.1
70	2	-4.0	-3.1
60	0	-10.2	
60	∞	-2.1	
60	2	-3.6	
50	0	-9.6	
50	∞	-1.9	
50	2	-3.3	
40	0	-9.1	-7.5
40	∞	-1.8	-1.0
40	2	-3.1	-1.8
30	0	-8.6	
30	∞	-1.9	
30	2	-3.2	
20	0	-7.0	-6.0
20	∞	-1.6	-1.0
20	2	-2.6	-1.6

falls from 2.5 to 4.0 percent on new properties to 1.8 to 3.1 percent for 30 year old properties (40 years remaining life), is roughly constant for a decade, and then declines further after 40 years. With an 8 percent expected inflation rate, the range declines from 2.1 to 3.1 percent on new properties to 1.0 to 1.8 percent for 30 year properties and is then roughly constant for the next two decades.

Commercial Properties

Exhibit 5 reports the same estimates as Exhibit 2, except for new commercial properties rather than residential properties. Assuming low inflation and discount rates (top panel of Exhibit 5) and a zero supply-price

--PLACE EXHIBIT 5 NEAR HERE--

elasticity, price would decline by 24.6 percent. With an infinite supply elasticity, the immediate percentage price decrease would be 5.3 percent. The corresponding long-run increase in real rents is 32.6 percent. With a finite-supply elasticity of 2, the immediate price decline is 8.9 percent, and the long-run increase in real rents is 26.5 percent.

These commercial price responses are roughly twice as large as the corresponding residential results. This is because straight-line, rather than accelerated, depreciation is optimal for commercial property and the time profile of straight-line deductions is more adversely affected than that of accelerated depreciation, by the five-year lengthening of cost recovery

EXHIBIT 5

INCREASE IN TAX LIFE OF EXISTING AND NEW PROPERTIES: NEW COMMERCIAL PROPERTY

	Supply Elasticity(β)	Immediate %Δ in Price	Long-Run %Δ in Real Price	Long-Run %Δ in Real Rents
Inflation Rate of 4%				
Low	0	-24.6	-24.6	--
Discount	∞	-5.3	--	32.6
Rate	2	-8.9	-4.6	26.5
High	0	-19.7	-19.7	--
Discount	∞	-5.0	--	24.6
Rate	2	-7.7	-3.7	20.0
Inflation Rate of 8%				
Low	0	-16.4	-16.4	--
Discount	∞	-3.1	--	19.6
Rate	2	-5.7	-3.0	16.0
High	0	-11.0	-11.0	--
Discount	∞	-2.7	--	12.4
Rate	2	-4.3	-2.1	10.0

periods.[5]

Percentage decreases for commercial property are more sensitive to alternative assumptions regarding inflation and discount rates than were those for residential properties. With 8 percent inflation, a relatively low discount rate, and zero supply-price elasticity, price will decline by only 16.4 percent (versus 24.6% at 4% inflation). A realistic estimate of the immediate price decline would decrease to the 3.1 to 5.7 range (from the 5.3 to 8.9 range at 4 percent inflation). The reduced commercial price declines at higher levels of inflation reflect the use of historical cost accounting. Taking away a fixed percentage of tax depreciation will have less of an impact on price because all depreciation is relatively less valuable at higher levels of inflation.

Section 4

INCREASED TAXATION OF EXISTING PROPERTIES ONLY

Prior to ERTA, existing properties were treated less favorably than new properties. Analysis of an increase from 15 to 20 years in the tax service life of existing properties only should provide an understanding of the significance of this differential treatment.

[5] For example, with accelerated depreciation the five year stretchout reduces the present value of the first 8 years of depreciation deductions by 20% (assuming $\pi = 4\%$ and a relatively high discount rate). The corresponding straight-line reduction is 37%. The impact on market prices of this relatively larger decrease in the value of the depreciation tax shield is then amplified by the resultant decline in the value of the interest tax shield. To demonstrate the interaction of tax depreciation and debt financing on market prices, we ran select simulations assuming pure equity fianancing. With 4% inflation, relatively high discount rate, zero supply price elasticity, and an equity risk premium of 4%, the 5 year stretchout reduces residential prices by 4.6% (versus 10.7% with debt financing). The corresponding price decrease for commercial property is a slightly larger 5.5% (versus 19.7% with debt financing). These results suggest that greater use of equity financing reduces the magnitude of price responses and decreases the disparity between commercial and residential price declines.

At first glance one might suppose that the increase in tax service life for existing property only would lower the value of existing properties by the amount deduced in our earlier experiment and leave the value of new properties unchanged. Neither of these suppositions is generally correct. The value of new properties would be unchanged only if any trade of the property were suboptimal before the tax change. Only in this event is the value of new properties independent of the tax treatment of existing properties. If some trading were optimal, then new properties will decline in value in response to the less favorable treatment of existing properties. Obviously the decline will be less than if new properties, too, were taxed less favorably. (In terms of Exhibit 3, the rightward shift in the demand schedule is less.) Thus, a smaller increase in real rents is needed for new properties to continue earning the market rate of return. Given the smaller rent increase, the decline in the value of existing properties will be greater than if both new and existing properties were taxed less favorably.

Results for residential property are reported in Exhibit 7 for both the low (4 percent) and high (8 percent) expected inflation and discount rate

--PLACE EXHIBIT 7 NEAR HERE--

senarios (the third set of results is described below). The calculations confirm the above analysis. The long-run percentage increase in real rents is less than half that computed when both new and existing properties were taxed less favorably, and the reasonable range of estimated price decline in new properties is 40 percent less, 1.5 to 2.2 percent versus the earlier 2.5 to 4.0 percent. In contrast, the decline in the value of existing (one-year old) properties is a far sharper 6.6 to 7.4 percent. With higher expected inflation, all changes are slightly less. This again reflects the negative

EXHIBIT 7

INCREASE IN THE TAX LIFE OF EXISTING PROPERTIES ONLY, RESIDENTIAL RESULTS

			New Properties		Existing Properties	
	Supply Elast. (β)	Long-Run % in Real Rents	Immediate %Δ in Price	Long-Run %Δ in Real Price	Immediate %Δ in Price	Long-Run %Δ in Real Price
Low Inflation Rate						
	0	--	-5.6	-5.6	-10.6	-10.6
	∞	5.9	-1.5	--	-6.6	-5.4
	2	4.8	-2.2	-1.0	-7.4	-6.3
High Inflation Rate						
	0	--	-5.6	-5.6	-9.4	-9.4
	∞	6.0	-1.4	--	-5.1	-3.9
	2	4.9	-2.1	-1.0	-5.9	-4.9

relationship between inflation and the value of depreciation deductions based on historical costs.

As noted, the impact of the increased taxation of existing properties on the value of new properties and thus the equilibrium level of rents depends on how soon new properties are likely to be traded and become existing properties under the tax code. For example, if refinancing were costless and the expected inflation rate exceeded 6 percent, then new properties are never expected to be traded under ERTA provisions (Hendershott and Ling, 1984) and taxing existing properties less favorably would have no impact on either the value of new properties or the level of rents.

It is noteworthy that the same, sharp decline in the value of existing properties can occur in response to a tax change even if the taxation of existing properties is not altered. More specifically, more favorable taxation of new properties has the same impact as does less favorable taxation of existing properties. In the former case, a decline in the level of future rents, which are determined from the conditions that investors in new properties will earn the market rate of return and the value of new properties is ultimately determined by the supply price, is the source of the decline in value.[6]

Exhibit 8 contains the same estimates as Exhibit 7, except for new and existing commercial properties rather than residential properties. The long-run increase in real rents, assuming 4 percent inflation and infinite supply-

--PLACE EXHIBIT 8 NEAR HERE--

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[6] Auerbach (1983, pp. 491-96) estimated that the more favorable treatment of new business investment in 1981 reduced the value of the existing capital stock by $131 billion, and Hendershott (1982, pp. 71-72) contended that providing subsidies for new housing units (as in the "Lugar bill" passed by the Senate in 1982) would lower the value of the unsubsidized housing stock.

EXHIBIT 8

INCREASE IN THE TAX LIFE OF EXISTING PROPERTIES ONLY, COMMERCIAL RESULTS

		New Properties		Existing Properties	
Supply Elastic.	Long-Run % in Real Rents	Immediate %Δ in Price	Long-Run %Δ in Real Price	Immediate %Δ in Price	Long-Run %Δ in Real Price
0	--	-15.6	-15.6	-19.7	-19.7
∞	18.5	-4.4	--	-8.6	-4.9
2	15.2	-6.4	-2.8	-10.6	-7.5
0	--	-8.1	- 8.1	-11.0	-11.0
∞	8.8	-2.1	--	-5.1	-3.2
2	7.2	-3.2	-1.4	-6.2	-4.6

elasticity, is 18.5 percent (versus 24.6 percent when the tax lives of both new and used properties are increased to 20 years). Estimates of immediate price declines for new properties decrease to the 4.4 to 6.4 range from the 5.0 to 7.7 range. The decline in the price of existing property is increased to the 8.6 to 10.6 range.

With 8 percent inflation, responses are again dampened by historical cost accounting. With an infinite supply elasticity, the long-run increase in real rents is reduced to 8.8 percent and the estimated range of immediate price declines for new properties falls to 2.1 to 3.2 percent from the 2.7 to 4.3 range. Immediate price declines for existing properties increase to the 5.1 to 6.2 range.

Section 5

OTHER TAX LAW CHANGES

The U.S. Senate Finance Committee considered recapturing at the point of sale all or some of the straight-line depreciation taken on a property if it sold in less than 10 years and approved legislation that would recapture all of the excess depreciation even if an installment sale were utilized. The bill passed by the full U.S. Senate would increase tax service lives to 20 years in 1985, but shift back to 19 years in 1986 and 18 years in 1987 and thereafter. The motivations for and possible impacts of these provisions are discussed in turn.

The increased taxation of properties traded in less than 10 years is obviously aimed at reducing the "churning" of properties or at least letting the Treasury (taxpayers generally) benefit from the churning (or suffer smaller loses if the churning is motivated by tax considerations). Churning of income-properties has undoubtedly been substantial in recent years in response to the passage of ERTA which has allowed investors to substantially accelerate their tax depreciation schedules (move to a 15 year life) simply by engaging in outright sales and repurchases. However, the concern with churning at this point seems misplaced. For one thing, investors desiring to get onto ERTA's more favorable depreciation schedule are probably already there. The horse is out; it's too late to close the barn door. For another, the current lengthening of tax lives will itself strongly discourage churning. In our estimation, this particular provision is unlikely to have a significant impact on real estate values or rents.[7]

The recapture of excess depreciation even in the presence of an installment sale, too, is unlikely to have a significant impact on real rents and prices. The Treasury acknowledges that installment sales are not widely used and thus that a stricter taxation of them will not have a major impact. The Treasury apparently fears a rapid expansion of installment sales and wishes to nip the growth in the bud.[8]

The rationale for the temporary increase in tax service lives to 20 years in 1984 and then reversal to 18 years by 1986 is unclear. The temporally severe tax treatment should substantially reduce building and development, as well as trading, in 1984 and 1985. Possibly Congress wishes to reduce inflationary pressures near term (1984 and 1985) and to raise tax revenues longer term (1986 when the trades postponed from 1984 and 1985 occur). And then, maybe there really is a tooth fairy.

[7] Users of properties who think there is a significant probability of their needing the property for less than 10 years and thus being taxed especially heavily upon sale would have an incentive to lease properties.

[8] The use of installment sales is analogous to the use of builder bonds in that both can substantially defer tax payments. Builder bonds have been widely used, much to the Treasury's dismay.

The partial equilibrium nature of our results needs to be emphasized before we conclude the analysis. If the changed tax law generates additional Treasury revenue and discourages development of new properties, interest rates are likely to be lower.[9] This would, of course, act to dampen the decline in values and the increase in long-run rents. That is, a decline in interest rate would shift the demand curve in Exhibit 3 to the left, tending to offset the tax-depreciation shift to the right. Thus far we have made the plausible assumption that the decline in interest rates would be negligible. However, if the increased taxation of real estate is just a small part of a broad deficit reduction package, then a significant reduction in interest rates could occur. Such a reduction is, in fact, the professed intent of the legislation.

To illustrate the potential positive value of a deficit reduction package, even one including more severe taxation of real estate, on property values, we have run simulations in which the tax life on new and existing properties is increased from 15 to 20 years and the basic debt rate is lowered by one or two percentage points. The results suggest that about a one and a quarter percentage point decline in the debt rate would approximately offset the impact of the increase in tax service life on residential properties. Larger declines are necessary to offset the impact on commercial properties.

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[9] For a general equilibrium analysis of the passage of ERTA, which concluded that real interest rates could rise by as much as two percentage points and fully offset the more favorable tax treatment of rental housing, see Hendershott and Shilling (1982).

Section 6

SUMMARY AND CONCLUSIONS

In this paper, we calculate the impact that alternative tax code changes would have on the value of both residential and commercial properties. This research was stimulated by the lengthy deliberations of the Finance Committee of the U.S. Senate in the Winter of 1984, deliberations that resulted in passage by the full Senate in April 1984 of legislation partially reversing the substantial benefits conferred upon real property by the Economic Recovery Tax Act of 1981. (What form final legislation will take depends on the outcome of a Senate-House Conference and future concurrence by the full Congress and the President.) Two separate proposals are considered in detail in this paper. The first would increase cost recovery periods (tax lives) from 15 to 20 years on both new and existing conventional residential and commercial properties. The second would increase to 20 years the recovery periods of existing properties only.

An increase in cost recovery periods will, ceteris paribus, lower property values and raise real rents. Full equilibrium requires that investment value of new properties to the marginal investor equals the reproduction costs (supply price) of new properties. With an infinite supply elasticity, the long-run change in real price and value is zero; the immediate decline in price reflects the failure of real rents instantaneously to attain their new long-run equilibrium. With a finite supply elasticity, the immediate decline in price reflects both rent adjustment lags and decreased production costs in response to a lowered demand. We assume a four year real rent adjustment lag which is, in our opinion, conservative in that estimated price declines are likely to be on the high side. In keeping with this conservative posture, we assume an elasticity of 2 in our finite supply elasticity simulations, the lowest figure with any empirical support.

With low (4 percent) inflation, a five year stretchout in tax lives will cause an immediate decline in the price of new residential properties of up to 4 percent. The long-run increase in real rents associated with this price decline is 10 to 12 percent, and the long-run price and quantity declines are 2 and 4 percent, respectively. Assuming that the four percent quantity decline occurs over a four-year period, and that normal real gross investment is 5 percent of the stock, investment in rental properties would be cut by 20 percent during this span. With high (8 percent) inflation and a relatively high discount rate, all the estimated changes are about a percentage point less.

Estimated price declines for new commercial properties are significantly greater than those for residential properties. With low inflation, price could decline 9 percent and rents rise by 25 percent. These larger commercial price and rent responses reflect the optimal use of straight-line depreciation, the time profile of which is more adversely affected by the five-year stretchout of the cost recovery period. With high inflation the commercial price declines fall to the 4 to 6 percent range and rent increases to the 10 to 15 percent range. This decrease reflects the use of historical cost accounting.

Similar analysis was performed on existing (up to 50 year old) properties. In general, the range of price reductions decreases ever so slightly with the age of the property. While the impact of four years of below long-run market rents looms larger as the number of years in which rent will be earned decreases and thus tends to exaggerate the price declines relative to new properties, the ratio of depreciable structure to the total value of the property declines as the property ages, mitigating the price decline.

A five year increase in the tax lives of existing properties only would reduce the range of price declines for new residential properties by roughly 40 percent relative to what would occur if both new and existing properties were taxed less favorably. The decline in the value of existing (one-year old) properties, however, increases to the 6½ to 7½ percent range. The price declines on new properties reflect the increased taxation, and the resultant decline in value, of existing properties. Because new properties would fall less in value if the five year stretchout only applied to existing properties, a smaller long-run increase in real rents is required to enable new property investors to earn the market rate of return. This would amplify the impact on existing properties because market rents would be determined by the impact of the legislation on new properties.

The partial equilibrium nature of our results needs to be emphasized. If the increased taxation of depreciable real estate is just a small part of a broad deficit reduction package, then a significant reduction in real interest rates would likely occur. We estimate that, for residential property, a one and a quarter percentage point decline in nominal debt rates would approximately offset the negative impact of the five year stretchout in tax lives on new and existing properties. (In the absence of such a decline, both rents and the homeownership rate will tend to rise, the opposite of the response to ERTA.) For commercial properties, possibly twice as large a decline in interest rates would be necessary to offset the more adverse depreciation.

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